Malawi Summary of Baseline Studies:

Country Report for the GFCS Adaptation Program in Africa

Working Paper No. 123

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

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Titles in this Working Paper series aim to disseminate interim climate change, agriculture and food security research and practices and stimulate feedback from the scientific community.

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Abstract

This report reflects the summary of baseline findings in Malawi, under the auspices of the Global Framework for Climate Services (GFCS) Adaptation Programme in Africa. It identifies gaps in climate information access and use at the local level, types of climate services farmers and pastoralists need in Malawi, relevant channels to reach farmers with requested services, lead-time and gender-specific requirements for the design and delivery of climate services that matter to farmers.

Based on what we learned from our research studies, we provide analysis and recommendations for the co-production of climate services with farmers and agricultural knowledge providers, large-scale delivery and continuous evaluation of climate services to improve service delivery. These recommendations intend to inform GFCS project partners' interventions to improve access and use of climate services by farmers and pastoralists in Malawi.

We find that farmers and pastoralists across Malawi currently make little use of weather and climate information. A relatively high proportion of households have access to this information (up to 80% of male-headed households in Lilongwe, Zomba and Nsaje versus 71% of female-headed households in Lilongwe, 54% in Nsanje and Zomba). Sometimes climate information comes with very basic agricultural advice (an average of 50% of surveyed households). But most of the households interviewed do not use these forecasts for their agricultural decision-making. Indigenous knowledge and personal experience remain the main sources of information that trigger farmers' agricultural decisions.

Scientific climate information is not used by the sampled farm households because they perceive this information as less reliable and not locally relevant to inform their cropping activities. Farmers need to be advised on improved cropping systems and agricultural technologies to minimize crop failure. In addition to information on climate, they would like to receive additional information on crop management and improved technologies. In addition, ensuring effective supply and availability of farm inputs (fertilizer, seeds) at the market will enhance farmers' ability to act on the information received. Across districts, we found that women have access to climate information, but to a lesser extent than men. The reason may lie in the fact that women own fewer communication assets, particularly radios, and may be often too busy with household chores. A limited number of women are able to use the advice bundled with the climate information because of their lower control of productive resources and training.

Across all districts surveyed, seasonal rainfall outlook, onset of rains, extreme weather events, end of the rainy season and number of days of rainfall are the five most important types of climate information farmers would like to receive. However, the relative importance of this information for men and women diverges slightly. In all districts, forecasts on the onset and cessation of rainfall is reported as the most important to women.

The relevant channels for delivering climate information to reach farmers and pastoralists on the large scale in order to address their climate services needs identified are radio (by far the major source through which climate information is currently channeled to households), cell-phone based SMS and voice, visits from government and NGO extension agents and television. The latter recently emerged as a significant information source for urban residents in Lilongwe, particularly for the daily weather forecast, the seasonal forecast and the forecast on the onset of rainfall. In Malawi, 37% of women own radios while 39.3% own cell phones. Finally, training key informants – particularly extension workers – in understanding climate forecast concepts and integrating them in agricultural activities emerged as an essential component for the effective communication of climate information services.

Several key insights can be derived from this analysis and can inform the design of climate services activities in the districts targeted. First, climate information for households should rely primarily on radio and extension workers both from government and NGOs. Second, training key informants on climate forecast concepts and integrating them into agricultural activities is essential for the effective dissemination of climate information services. Third, supply of the markets with farm inputs will enable farmers to better act on the climate information received. Fourth, climate services products delivered to farmers should include forecasts on the onset of rainfall, frequency of extreme events, distribution of rainfall over the agricultural season and the end of the rainy season. Fifth, traditional indicators should be valued and integrated into the conventional climate forecasts to promote farmers' use of scientific climate information in conjunction with their own indigenous knowledge. Finally and mostly critically, dialogue between national meteorology services, extension agents and farmers will represent an effective platform for the co-production of relevant and useful climate services for farmers.

It is our hope that these findings will offer valuable insights to the GFCS Adaptation Program in Africa, as well as future projects working to scale up relevant climate services for farmers and pastoralists in the country.

Keywords

Climate Services; Farmers; Pastoralists; Malawi; ICTs; Radio.

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We also wish to thank all of our partners on the GFCS Adaptation Program in Africa for their kind review and inputs to the development of this summary report: Sofie Sandstrom (WMO), Katiuscia Fara and Kaisuleena Rajala (WFP) and Clement Boyce from the Malawi Department of Climate Change and Meteorological Services (MDCCMS).

CCAFS undertook these baseline activities in Malawi under the auspices and with financial support of the Global Framework for Climate Services (GFCS) Adaptation Programme in Africa,. The GFCS Adaptation Program in Africa is funded by a grant from the Government of Norway, and is implemented with technical support from the World Meteorological Organization (WMO). The Global Framework for Climate Services (GFCS) is an international partnership seeking to harness scientific advances and improve the availability, accuracy and use of climate information, which will help society cope with climate change and hazards such as droughts and floods. The GFCS Adaptation Program in Africa aims to increase the resilience of people most vulnerable to the impacts of weather and climate-related events through the development, implementation and evaluation of a joint program for the target countries: Tanzania and Malawi. The program seeks to build integrated frameworks within countries and will support existing initiatives to improve the provision and use of climate services for food security, nutrition and health, and disaster risk reduction. The GFCS Adaptation Program in Africa is funded by a grant from the Government of Norway, and is implemented with technical support from the World Meteorological Organization (WMO).

Contents

Acronyms

CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
FRI	Farm Radio International
GFCS	Global Framework for Climate Services
ICT	Information Communication Technologies
ICRAF	International Centre for Research in Agroforestry (World Agroforestry Centre)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
NGO	Non-Governmental Organization
WMO	World Meteorological Organization

Introduction

Under the auspices of Global Framework for Climate Services (GFCS) Adaptation Programme in Africa, funded by the Government of Norway, the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) conducted baseline studies to understand the specific need, access and delivery of climate services for farmers and pastoralists in the two target countries, Malawi and Tanzania.

This report consolidates findings from the three different studies commissioned by CCAFS in the year 2014 to inform planning of project activities and formulate recommendation for scaling up climate services for farmers and pastoralists in Malawi:

- What Climate Services Do Farmers and Pastoralists Need in Malawi? Baseline study for the GFCS Adaptation Programme in Africa (Coulibaly et al. 2015);
- Leveraging the Power of ICTs to Scale Up Climate Information Services in Malawi and Tanzania: Scoping Study for the GFCS Adaptation Programme in Africa (Guntunku et al. 2015); and
- Delivering Climate Services At Scale for Farmers and Pastoralists Through Interactive Radio: Scoping Study for the GFCS Adaptation Programme in Africa (Hampson et al. 2015).

These studies employed a range of methods (Table 1) to capture the climate services needs and access in the pilot sites, and formulate models for delivery channels for tailored climate information.

Summary of Findings

Site Characteristics

In Malawi the following three pilot sites were surveyed: Lilongwe, Nsanje and Zomba (Figure 1). Chikwawa and Balaka are two sites for which no surveys were conducted due to lack of partners' intervention information for Chikwawa and shifting of WFP activities from Zomba to Balaka. As indicated in Table 2, the three sites in Malawi have different livelihoods and rainfall. In Lilongwe the main livelihood of 45% interviewed household is farming, while 21% are agro-pastoralists. Similarly in Nsanje and Zomba, 68% and 56% are farmers, whereas 28% and 41% are agro-pastoralists, respectively. In terms of rainfall, Lilongwe and

Nsanje have 900 and 740 mm/annum respectively. However, Zomba faces quite a variable rainfall in the average range of 600 to 1500 mm/annum.

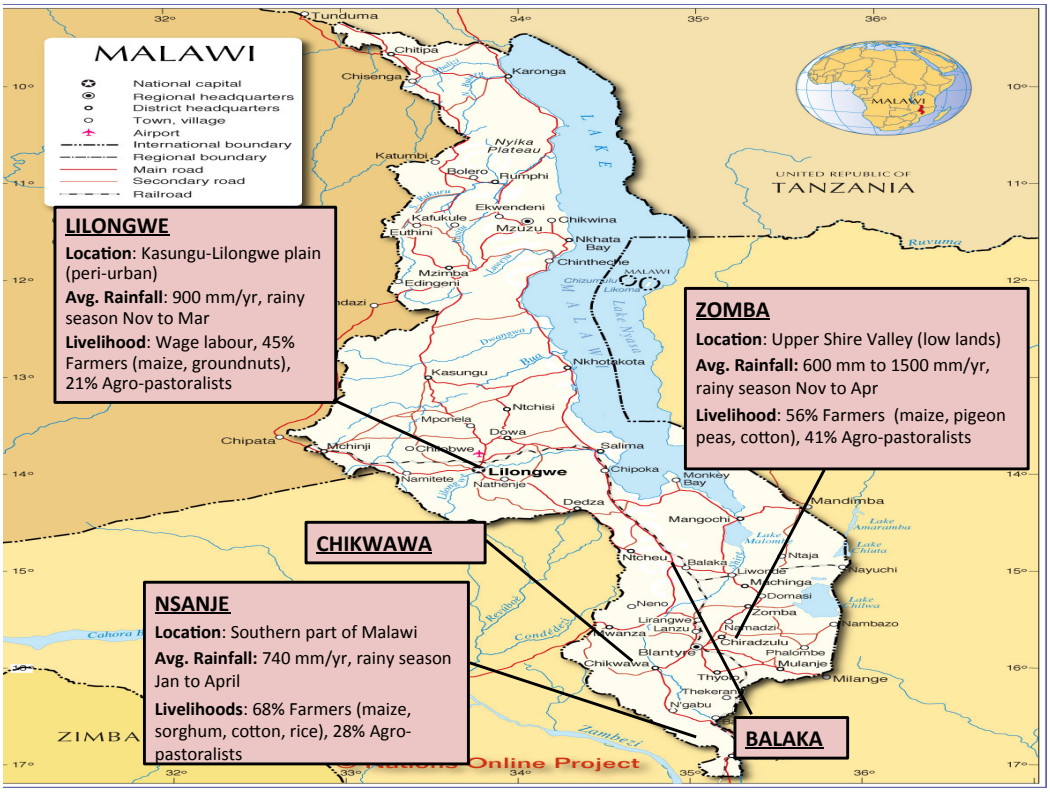
Table 1: Summary of methods followed in 3 baseline studies.

Study	Methods	Description
Needs assessment baseline	Household interviews; Key informant interviews	Survey instruments derived from pilot CCAFS baseline tools to measure the value of climate services for farmers. GFCS partners contributed questions and specific input to adapt the survey to the context of country and needs of the project. A stratified random sampling design including village experiments (to receive the program) and controls (to serve as comparison) was used for the individual household data collection process. Key informants interviews involved a purposive sampling design.
Scoping Study: Rural Radio	Audience research	FRI used non-paper based survey tools – a combination of mobile phones and web-based software called Mobenzi. Enumerators underwent a one-day training on the use of Mobenzi Researcher to collect data via mobile phones.
	Key informant interviews	Small group discussions and workshops with stakeholders to assess current interventions and services related specifically to the use of radio and other ICTs for providing climate services and information. Roles of the identified national level players in relation to climate information services included: content generation, monitoring and dissemination of climate information, research and training, provision of extension and land management services and provision of relief and disaster risk management services.
Scoping Study: ICTs	Desk review	Literature review of good practices in scaling up climate services through ICTs and lessons learned from pilot episodes of delivering climate information in Africa and South Asia.
	Field visit	To validate and confirm the current role of the key organizations identified from the desk review in delivering climate information services for farmers.
	Data analysis	Analyzed the data collected in the field, and confronted them with findings from desk review to achieve a clear picture of current ICT-based climate service delivery in Tanzania.

Table 2: Site characteristics of GFCS pilot sites in Malawi, CCAFS baseline survey 2014.

Pilot Site	Main Livelihood (in %)		Characteristics		
	Farming	Pastoralism	Location	Mean Annual Rainfall (mm)	Rainy Season
Lilongwe	45	21	Kasungu-Lilongwe plain	900	Dec to March
Nsanje	68	28	Southern part of Malawi	740	Jan to April
Zomba	56	41	Upper Shire Valley	600-1500	Nov to April

Figure 1: GFCS pilot sites in Malawi.



As far as the level of education is concerned, it is found that more than 60% households in Malawi have primary education, but completely lack post-secondary education. Table 3 highlights this information for each pilot site in Malawi.

Table 3: Level of education in Malawi, CCAFS baseline survey.

Level of Education (% of households)	Lilongwe	Zomba	Nsanje
None	10	16	24
Primary School	62	69	57
Secondary School	26	15	17
Post-secondary	1	0	1
Other	1	0	1

High Food Insecurity

More than 55% of the interviewed households reported that in the past year they were not able to produce enough staple food to meet their yearly consumption needs. As indicated in Figure 2, a larger proportion of respondents indicated a deficit in food supply in Zomba (63%) and Nsanje (81%) compared to Lilongwe (58%). Moreover, about 60% of the households reported that their food supply from their own farm has been decreasing year to year (Figure 3). The

main reasons cited for the change in food supply were changes in rainfall, use of fertilizer and lack of advice on farm inputs or the resources to acquire necessary farm inputs.

Figure 2: Household food supply in Malawi sites in 2013 crop season, CCAFS baseline survey.

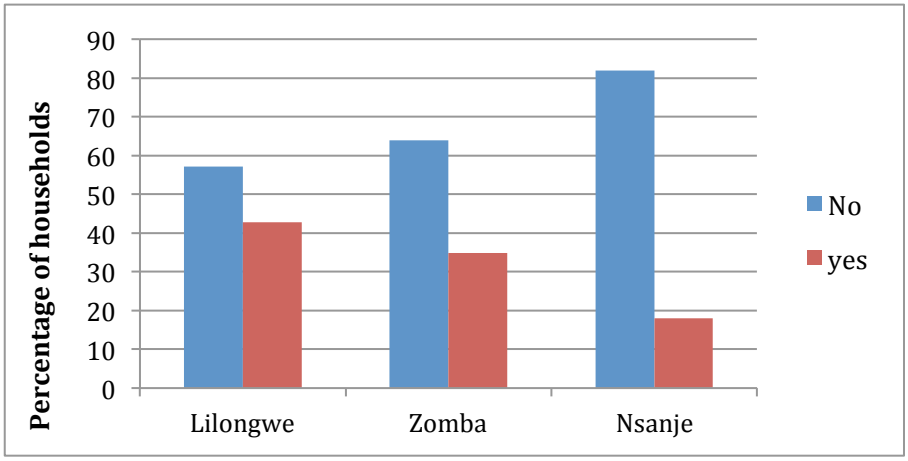
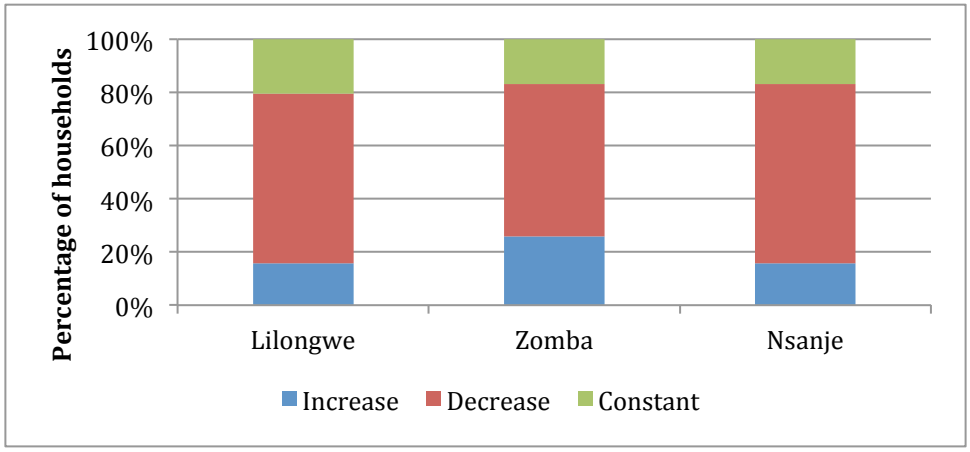


Figure 3: Household food supply trend in Malawi sites in 2013 crop season, CCAFS baseline survey.



Risks to Agricultural Productivity

The top 5 risks that jeopardize livelihood activities in Malawi are noted as: erratic rainfall, lack of inputs, lack of cash, flood/drought and pest and diseases. Out of these five, households and key informants note that erratic rainfall, lack of input and flood/drought are the three main risks to agricultural productivity in the baseline surveys across the GFCS project sites in Malawi (Figs. 4, 5).

Figure 4: Top 5 risks that jeopardize livelihood activity according to households, CCAFS baseline survey.

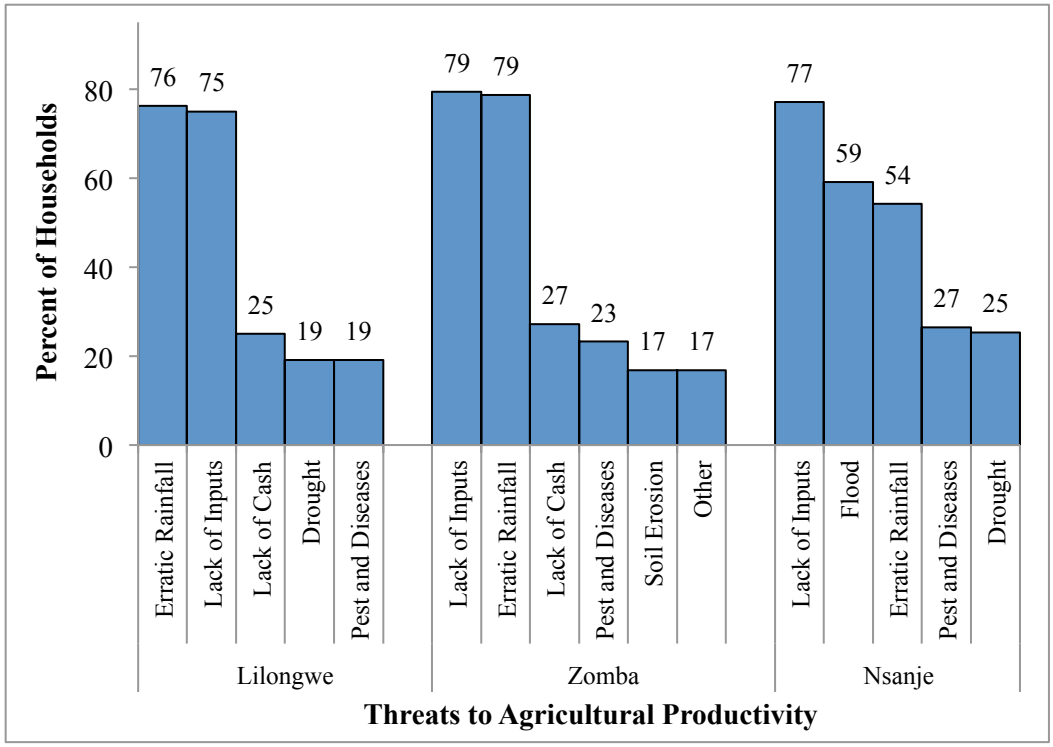
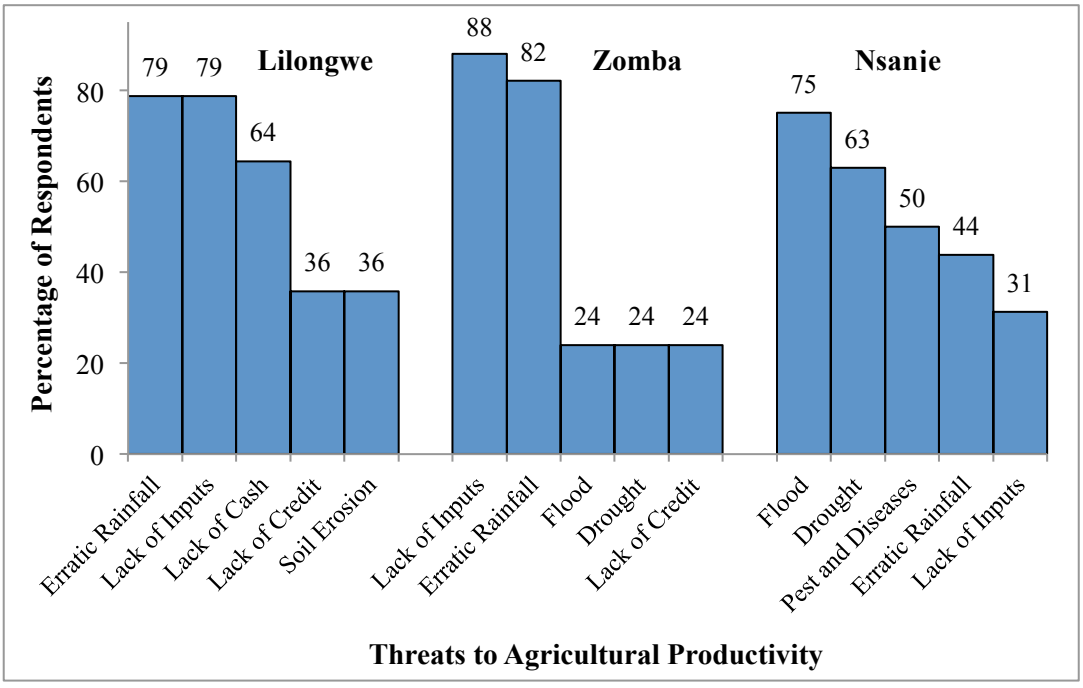
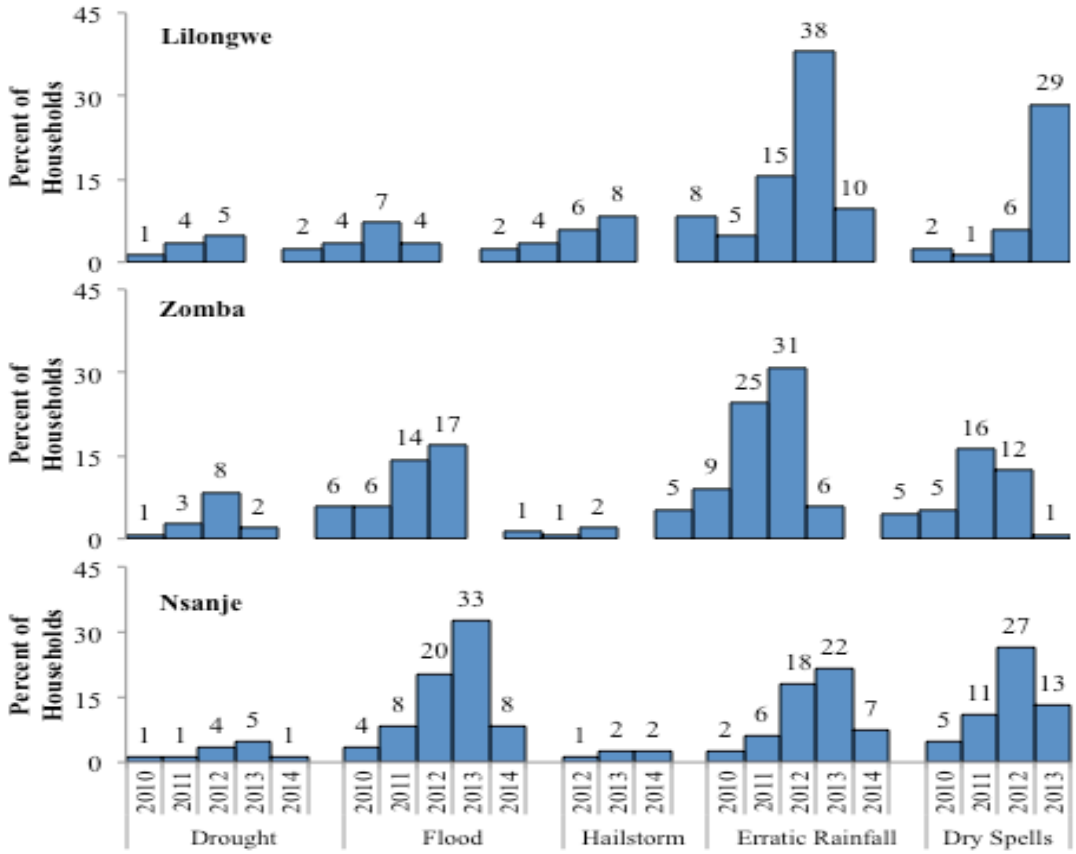


Figure 5: Top 5 risks that jeopardize livelihood activity according to key informants, CCAFS baseline survey.



In addition to these risks, farmers and pastoralists in Malawi also indicated that major climate shocks have been erratic rainfall, dry-spells, floods and droughts in past 5 years. Lilongwe, Nsanje and Zomba mostly faced erratic rainfalls and dry spells.

Figure 6: Climate Shocks that have affected Households during the last 5 years, CCAFS baseline survey.



The most immediate reported outcome after a climate shock, regardless of the type, was decline in crop yield. This threatens households' food security. In addition, increased food shortage and loss of assets and income were also reported as serious impact of climate shocks (Figure 7).

Most often, households claimed to be powerless when they face a climate shock, even in Lilongwe where households were found to be relatively wealthier than respondents in the other districts. Households were particularly powerless when confronted with pest, diseases and hailstorms shocks. When they were able to respond to the climate shocks, the most common coping strategies reported were off-farm employment, particularly casual labour "*ganyu labour*", participation in food for work and sales of livestock. In Lilongwe, the wealthier households sometimes borrowed money from the bank to cope with the adverse effect of the shock (Figure 8).

Figure 7: Impact of climate shocks experienced in the last 5 years, CCAFS baseline survey.

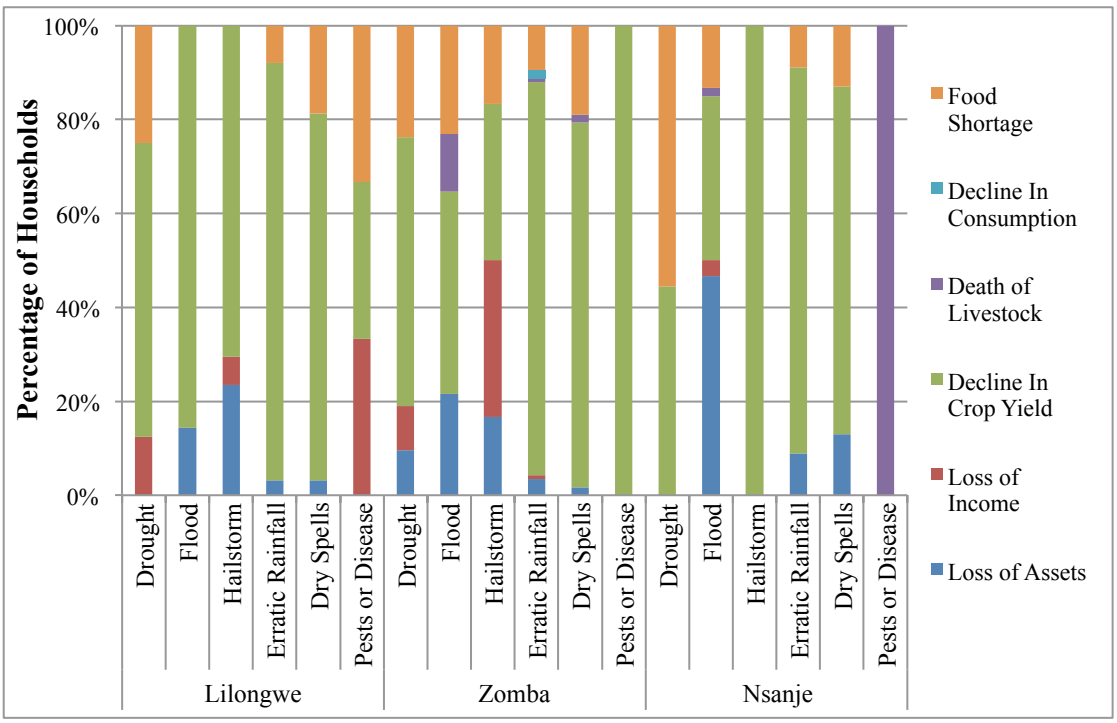
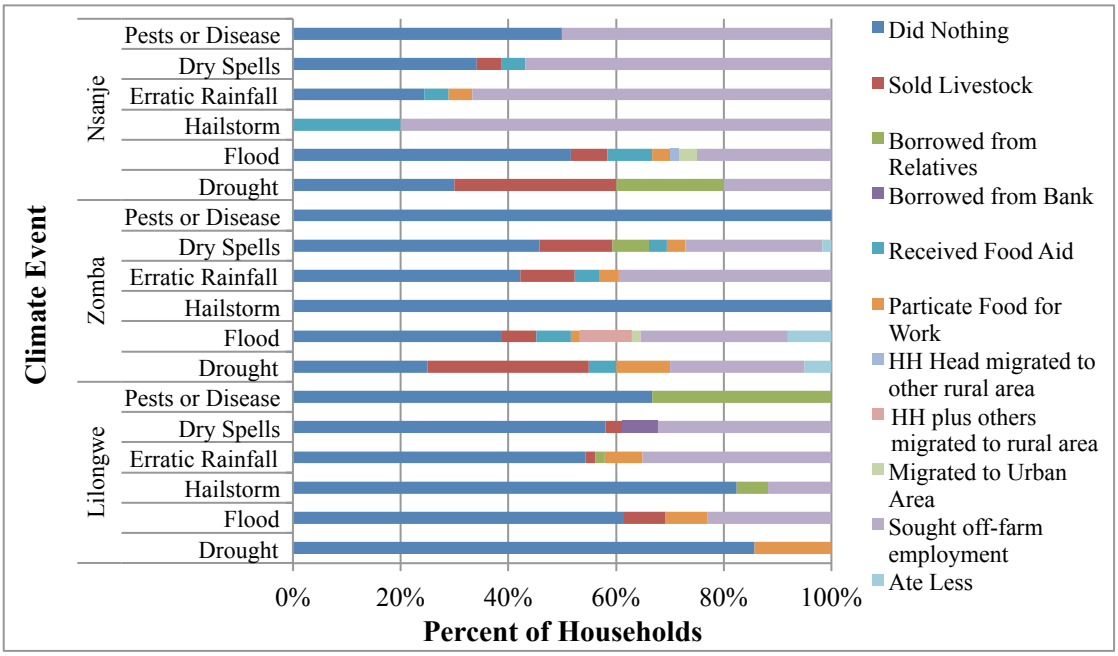


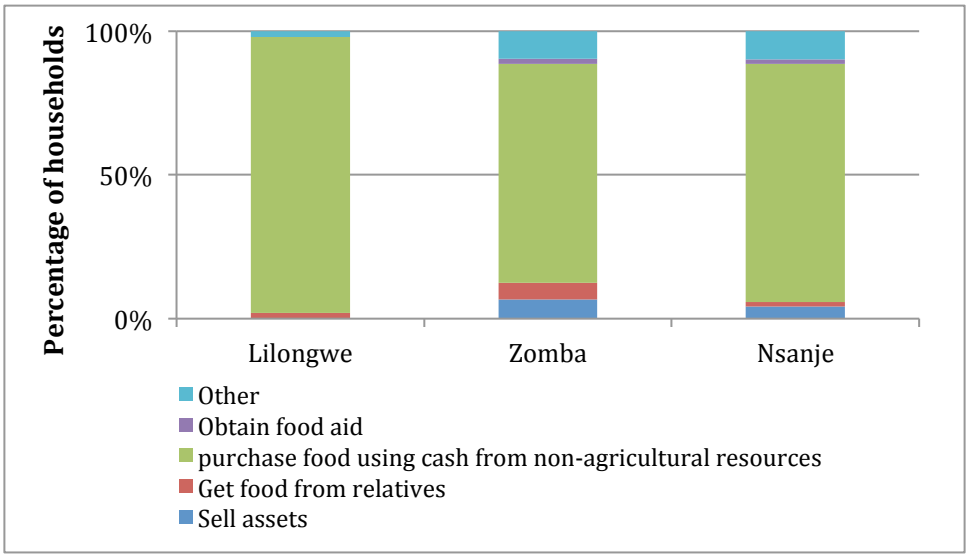
Figure 8: Strategies adopted to respond to Climate Shocks in the last 5 years, CCAFS baseline survey.



The worst consequence of climate shock is shortage of food supply. Thus, to cover the gap in food supply and feed themselves, farmers and pastoralists in Malawi mostly purchase food by

using cash from non-agricultural resources. Some of them even resort to getting food from relatives in those tough hours. This underlines the cause for the local communities to be trapped in the vicious circle of poverty for decades.

Figure 9. Strategies households adopted to cover the gap in food supply, CCAFS baseline survey.



Local Gaps in Climate Information Access and Use

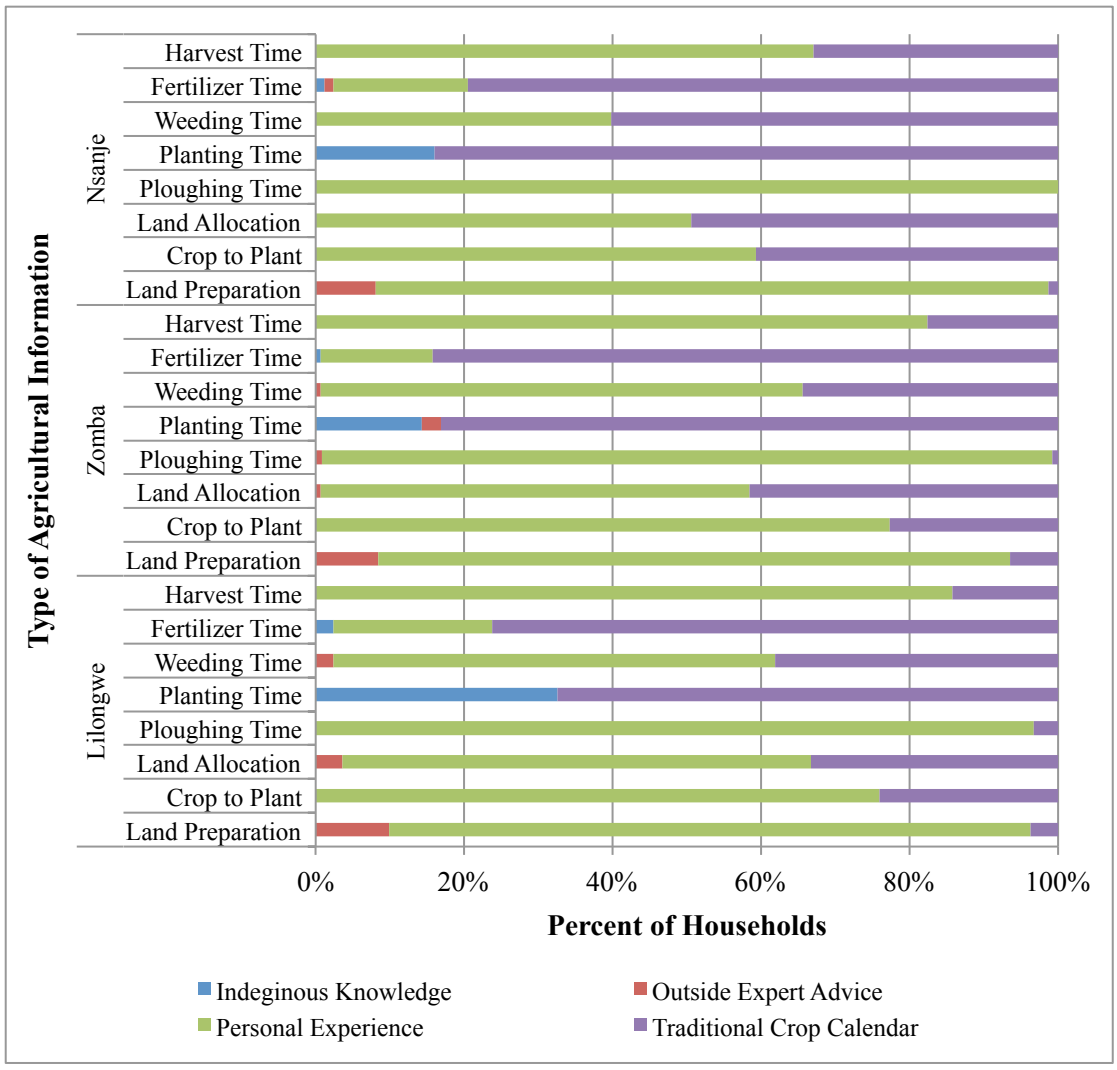
The sources of information households have been using over the last 3 years to inform their agricultural decisions include indigenous knowledge, observations, personal experience, traditional cropping calendar and advice from agricultural experts (Figure 10). These findings can be used to monitor changes in the kind of information households will be using over the course of the project and whether the relative importance of these information will change overtime.

Results showed a similar pattern across districts. For most farmers, decisions on when to start land preparation are based on traditional cropping calendars, as reported by about 70% of the respondents. Farmers use the month of the year to know when to start land preparation; the majority of farmers do their land preparation from August to October. The traditional cropping calendar is also largely used to determine ploughing time by an average 80% of the households interviewed. This is generally done from October to November. Decisions to allocate land rely for more than 70% on personal experience. Farmers make their decisions based on land availability, soil type and crop rotation system.

On average 83% of households reported that decisions on what crops to plant are influenced largely by personal experience. Respondents acknowledged being influenced by the availability of seeds, crop performance and yield of the previous season. They have a

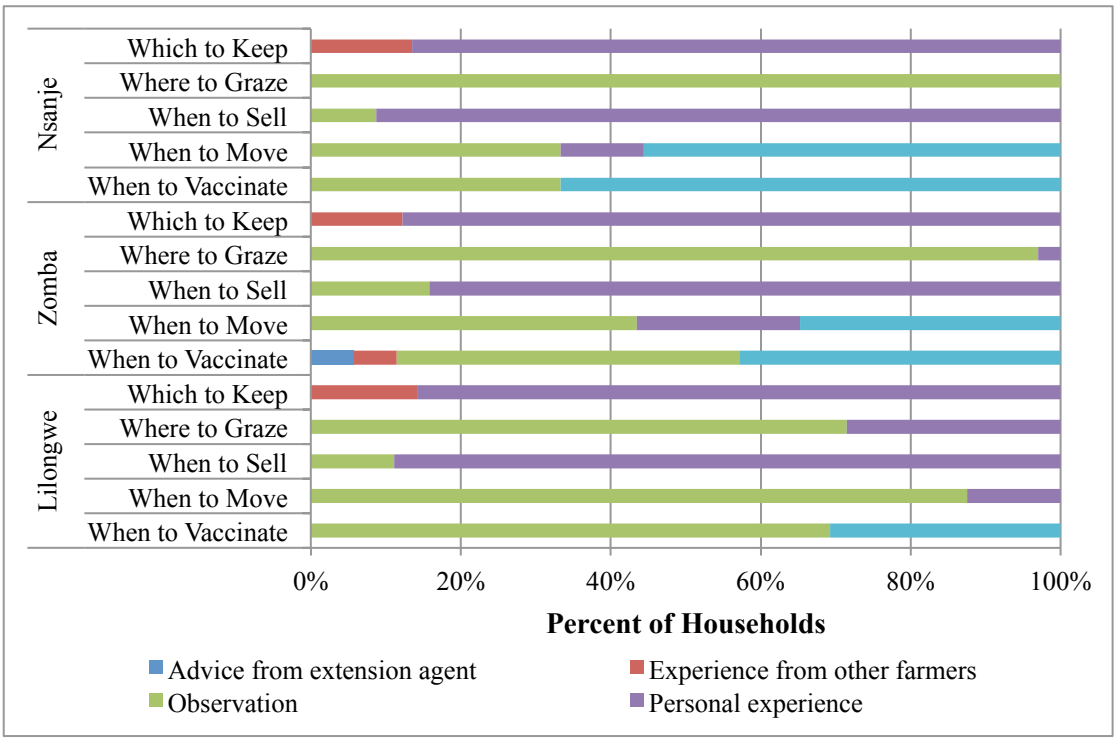
preference for hybrid varieties, early maturing and drought resistant varieties. Planting time is driven by traditional cropping calendar (70%) and observation of the environment (about 20%). Households that rely on a traditional cropping calendar often start planting in November and December. Observation of the environment includes noting the first rains, sufficient quantity of rainfall and soil wetness. Weeding time was influenced by observations as reported by 30% to 60% of the respondents. Farmers look for the appearance of weeds or rains.

Figure 10: Source of information for crop decision making, CCAFS baseline survey.



Similarly, for pastoralists, traditional observations followed by personal experience are the most common sources of information to inform their livestock decision making in Malawi. In Lilongwe, advice from extension agents is taken only in the case of vaccinations, while in Zomba and Nsanje, extension agents also recommend the time to sell the livestock. Some pastoralists in Zomba and Nsanje take the advice of other farmers in order to decide the time for selling livestock.

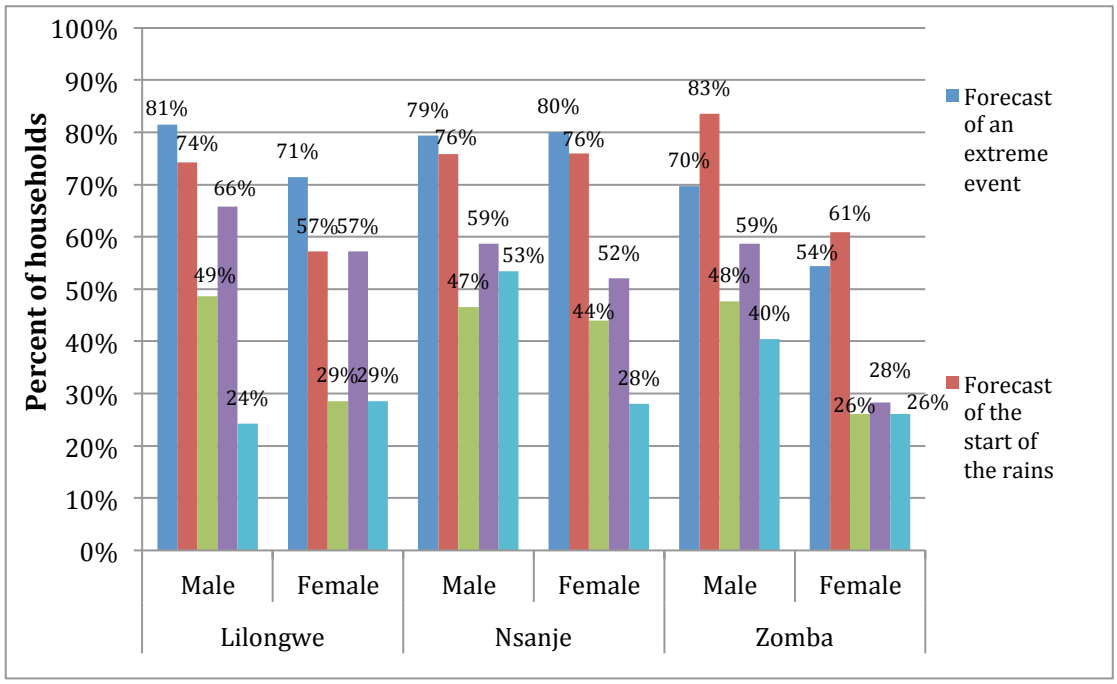
Figure 11: Source of information for livestock decision-making, CCAFS baseline survey.



State of climate information access and use in 2014

The three most common types of climate information currently received by households interviewed are forecasts of extreme events, forecasts of the onset of rainfall and daily weather forecasts. The same types of information are received by both men and, to a lesser extent, women. Eighty percent of male household heads in Lilongwe and Zomba reported receiving information on forecasts of extreme events while 71% of women in Lilongwe and 54% in Zomba acknowledged receiving this type of information. In Nsanje this percentage is estimated at 80% for both men and women. (Figure 12). Forecasts of the onset of the rain are reported by around 70% of the interviewees in all districts. Daily weather forecasts are the third most commonly received climate information. An average of 50% of the respondents receive this information in Zomba and Nsanje and 64% in Lilongwe. Households less frequently receive seasonal monthly forecasts, and forecasts of pests and disease. Less than 40% of the respondents reported receiving this information.

Figure 12: Current climate information received by households, CCAFS baseline survey.



Communication channels currently used to reach farmers

Regardless of the type of information, **radio is by far the major source through which climate information is channeled to households,** as reported by about 80% of the respondents. Extension agents are the second largest channel, followed by friends, relatives and neighbors. In the districts surveyed, the extension staff from government and NGOs provide information on the onset of rains, expected seasonal rainfall and risk of floods. In Lilongwe, television is also a significant source of climate information, particularly for the daily weather forecast, the seasonal forecast and the rainfall onset forecast (Figure 13).

Lead time

Results show that climate information in Malawi sites was mostly received on a seasonal basis except for the daily weather forecasts, which were received daily. The most frequently reported lead times on climate information were months ahead of the forecasted event, followed by weeks ahead. For the daily weather forecast, the lead-time selected was few hours ahead of the event.

In all villages surveyed, advice provided by extension agents and climate service providers was often very basic agricultural information, advice on the security of persons and property. Concerning the ability to use the agricultural advice, overall fewer households declared being able to use the advice, and women were significantly less able to use the advice compared to men. This is explained by women's poor control of and access to households' agricultural assets.

Figure 13: Current sources of climate information received by respondents, CCAFS baseline survey.

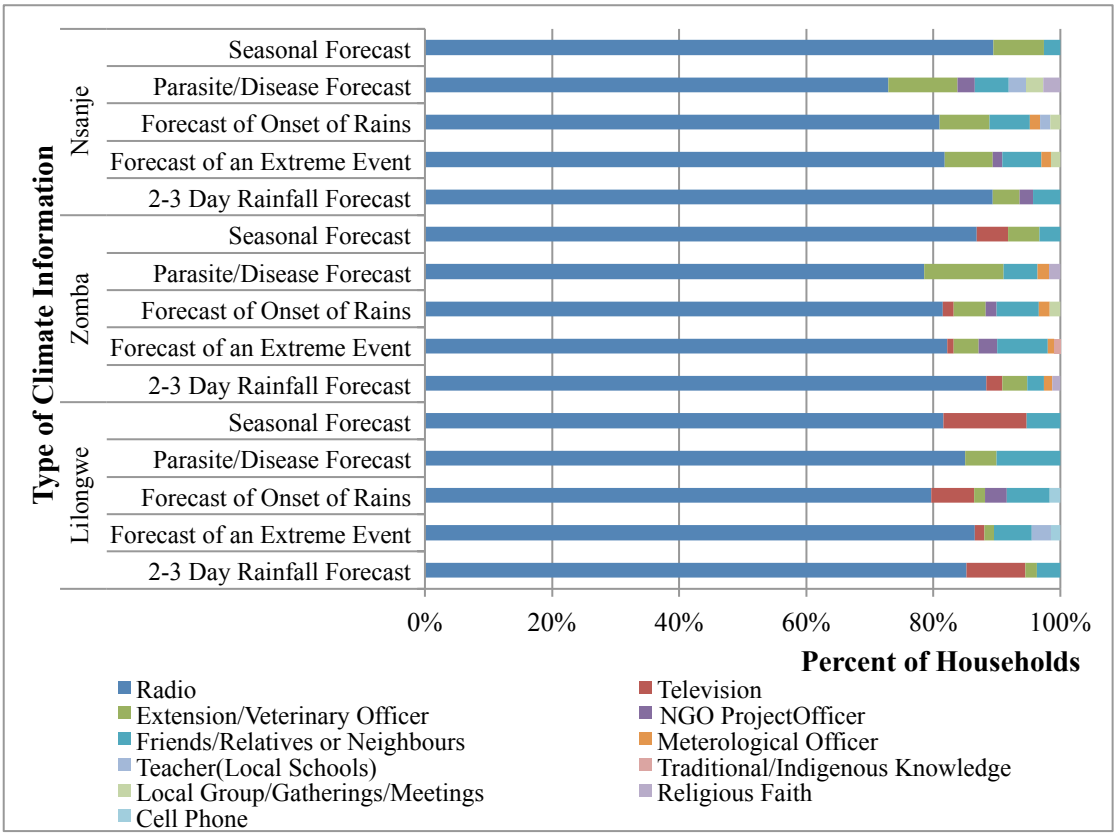


Figure 14: Lead times of climate information currently received by the respondents, CCAFS baseline survey.

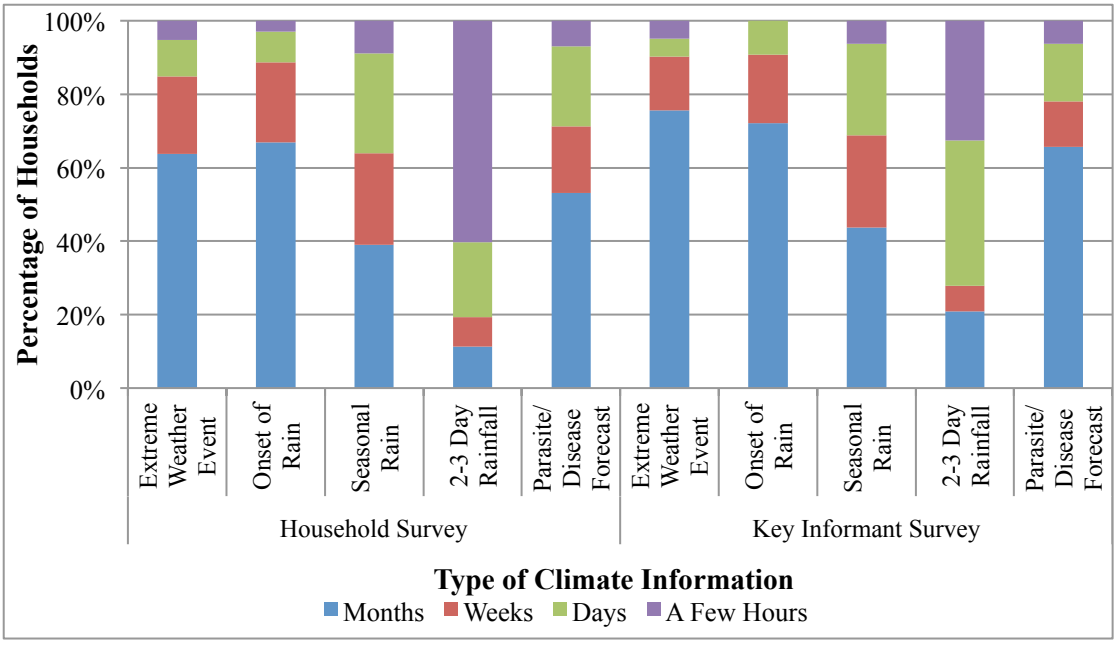


Figure 15: Lead times of climate information currently received by the respondents, CCAFS baseline survey.

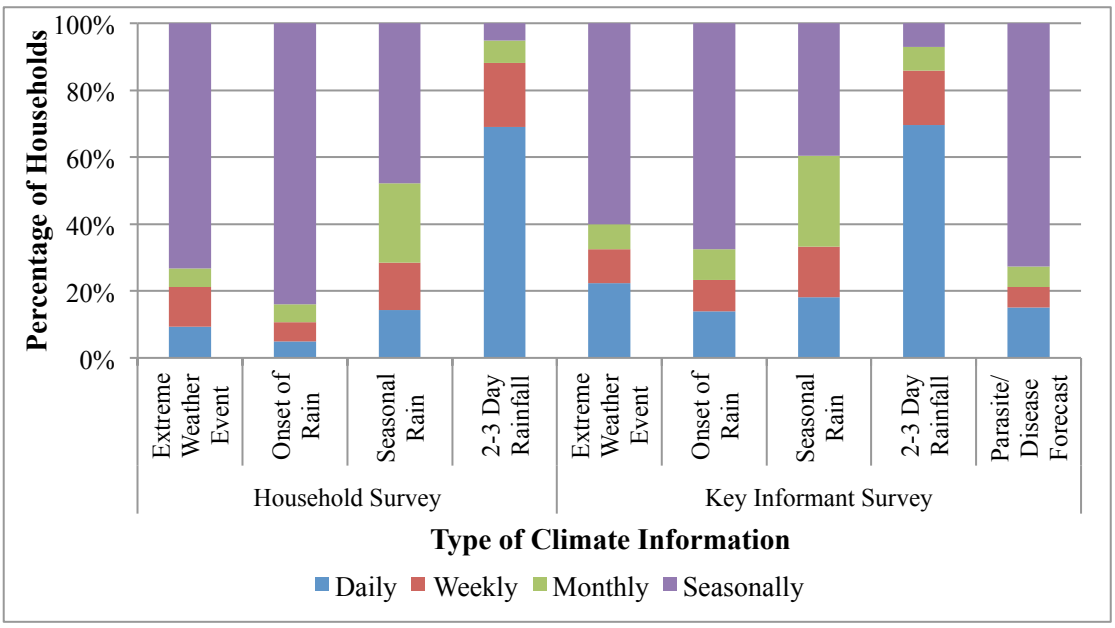
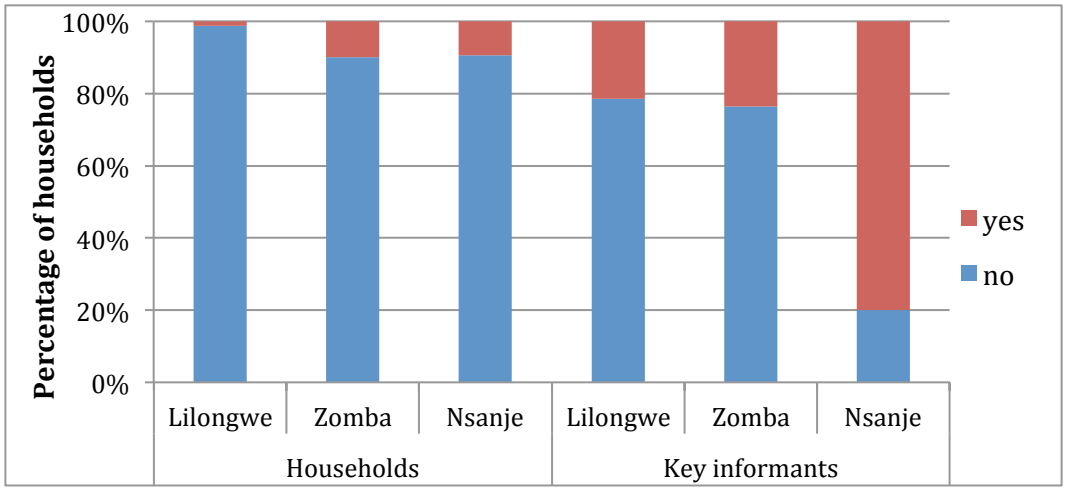


Figure 16: Household attendance and key informants awareness of climate training in the past year, CCAFS baseline survey.



Impact of farmer trainings

Few of the 70% of households who attended the training reported modifying activities after training. The highest proportion was 33% in Nsanje, followed by 21% in Zomba with the fewest modifications being done in Lilongwe district – 9%. Some households reported not modifying their activities because they had inadequate land on which to try out the ideas, lack of time during which to try out the ideas, the ideas were just newly learned, while there was no specific reason for others. The most common way in which agricultural activities were

modified in Lilongwe was the planting of soil protection plants, while in Nsanje and Zomba changes included the new farming practices of compost and manure application and zero tillage (Figure 17).

Figure 17: Ways in which households modified activities after attendance of training on climate information, CCAFS baseline survey.

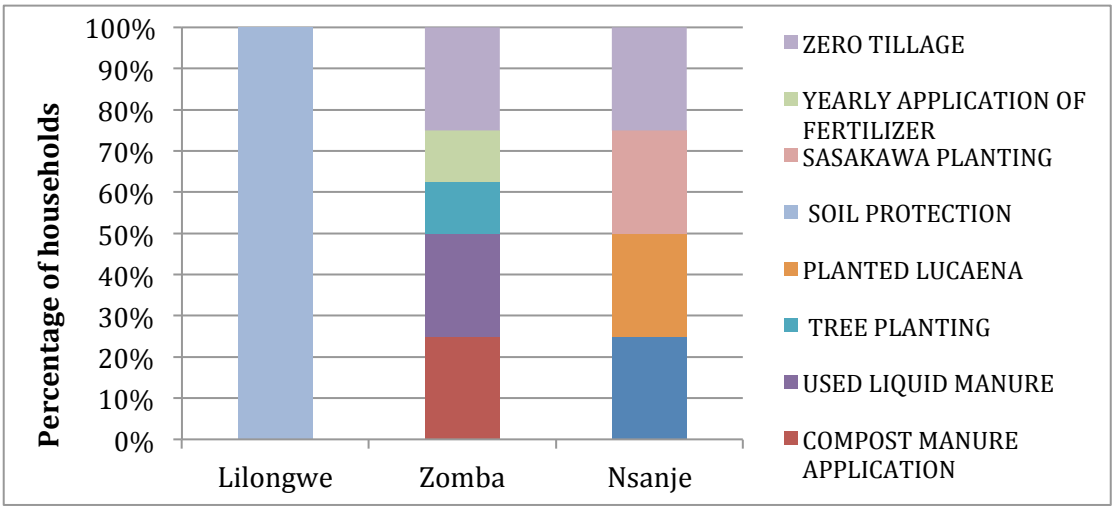
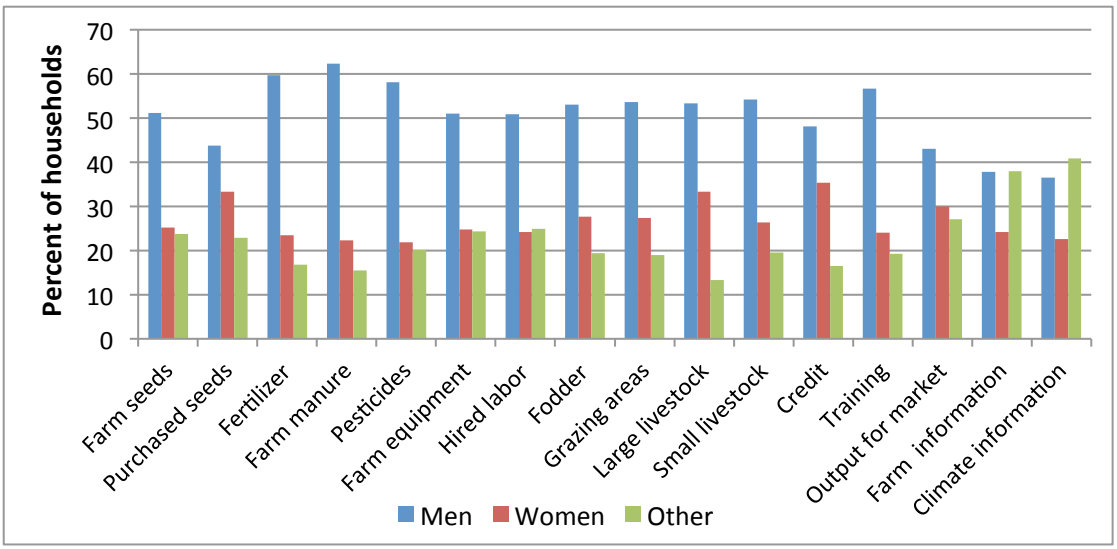


Figure 18: Women's control of agricultural resources within household, CCAFS baseline survey.



Climate information use in 2014

While households have access to climate information with sometimes very basic agricultural advice, most of the households interviewed do not use these forecasts for their agricultural decision-making. Rather, indigenous knowledge and personal experience are the main sources

of information that trigger farmers' agricultural decision making. These results raised the issue of reliability and relevance of climate information for the farm households surveyed.

The sampled farm households do not use scientific climate information because they perceived this information as less reliable and not locally relevant to inform their cropping activities. Farmers need to be advised on improved cropping systems and agricultural technologies to minimize crop failure. Indeed, they have indicated that in addition to information on climate, they would like to receive additional information on crop management and improved technologies.

Additionally, ensuring effective supply and availability of farm inputs (fertilizer, seeds) at the market will enhance farmers' ability to act on the information received. Women have access to climate information to a lesser degree than men. The reason may lie in the fact that they own fewer communication assets, particularly radios, and may be often too busy with the household chores. In addition a limited number of women are able to use the advice bundled with the climate information because of their lower control of productive resources and training.

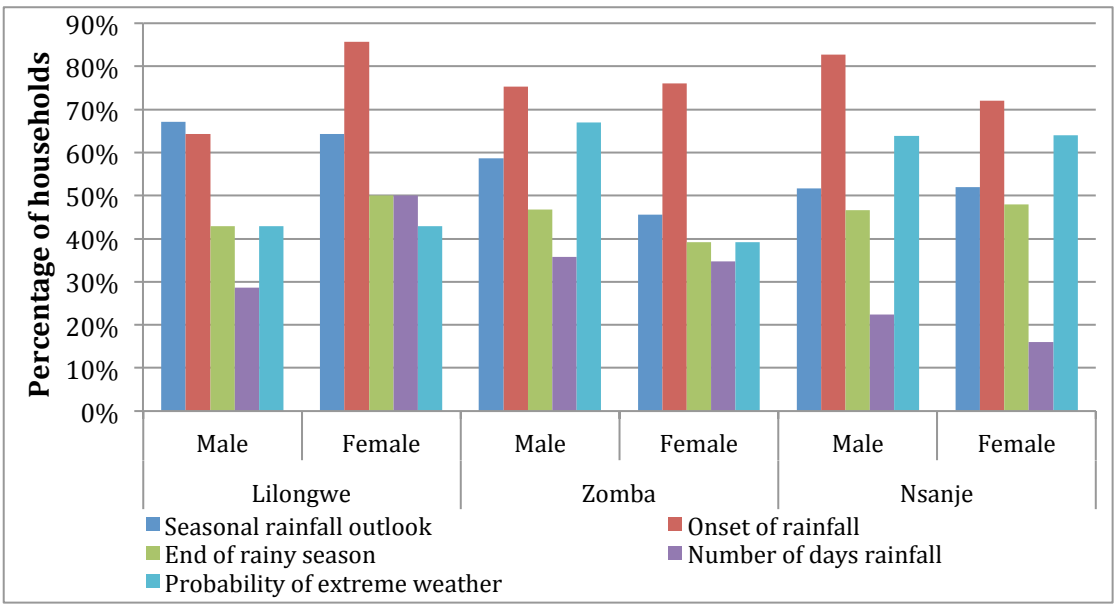
Climate Services Needed

Types of information

In all districts, seasonal rainfall outlook, onset of rains, extreme weather events, end of the rainy season and number of days of rainfall are the five most important types of climate information farmers would like to receive. However, the relative importance of this information for men and women diverges slightly. In all districts, forecast on onset and cessation of rainfall is reported as the most important to women.

In Lilongwe, 86% of female household heads interviewed would like to receive this information while in Nsanje and Zomba these proportions are 72% and 76%, respectively. For male household heads in Nsanje and Zomba, forecasts of the onset of rainfall is the most important type of climate information, as reported by about 80% of the respondents in these districts. But in Lilongwe, seasonal rainfall outlook is the most important type of climate information for 67% of men. In this latter district, forecasts of the onset of rainfall is the second most frequently reported type of climate information that men and women prefer.

Figure 19: Types of climate information that farmers and pastoralists wish to receive, CCAFS baseline survey.



In Zomba and Nsanje, the probability of extreme events is the second most preferred type of climate information for both men and women (Figure 19). These districts lie in the Shire River Basin and are very prone to climate extremes, particularly flood. So forecasts of extreme events are perceived as essential to both agricultural activities and people's lives and will be critical for the adoption of preventive measures against the climate disasters. The interviews with key informants have also revealed that extreme event forecasts are of utmost importance to better manage climate related risks in their community.

Figure 20: Type of weather information needed in general (n=655). Farm Radio Scoping Study.

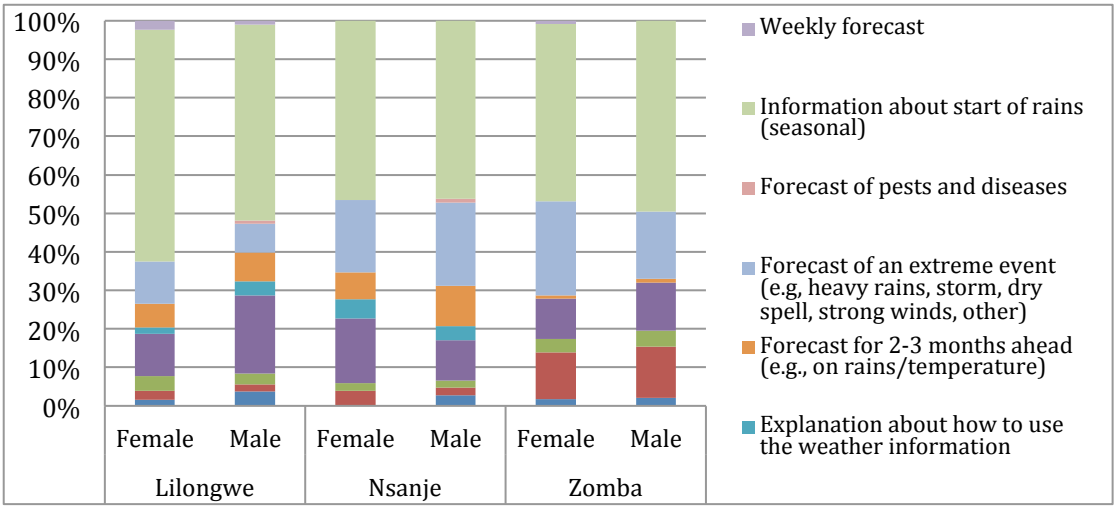
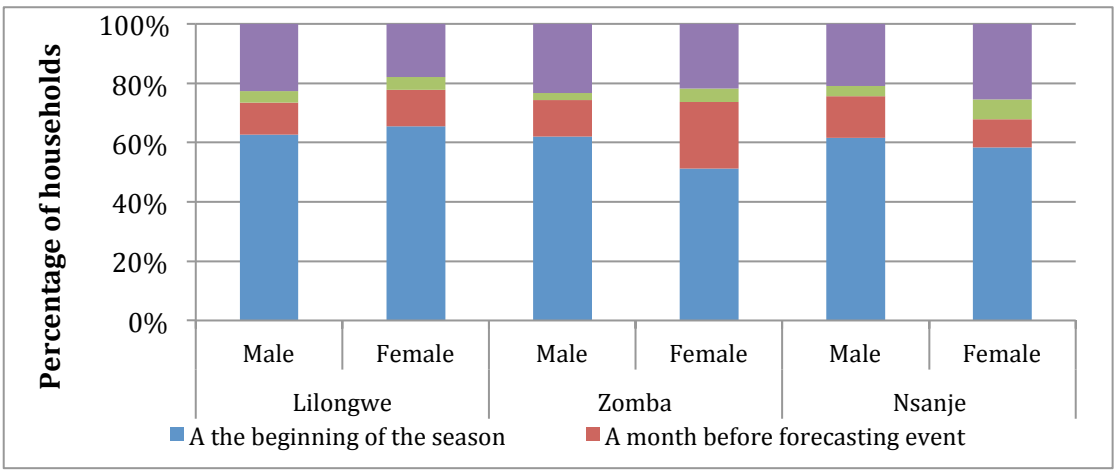


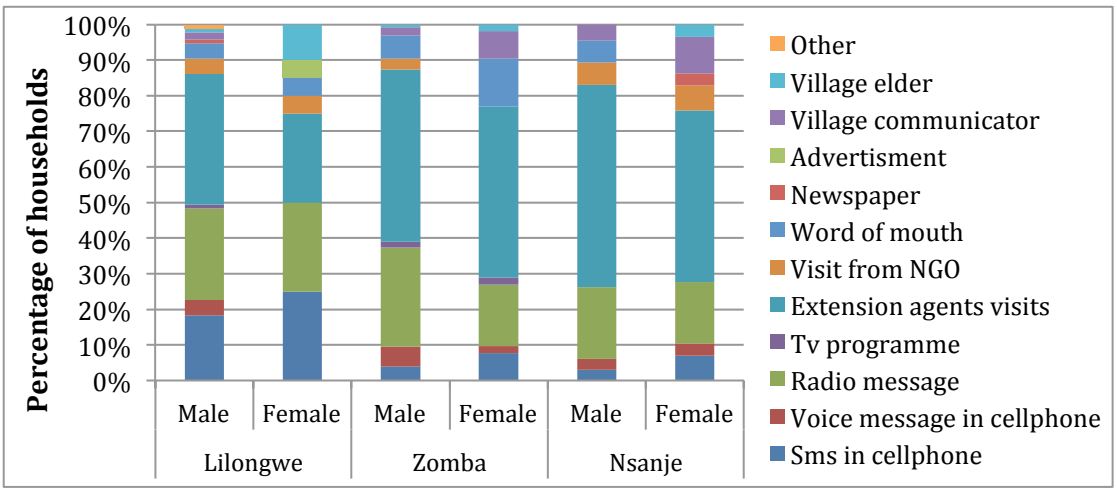
Figure 21: Lead times farmers and pastoralists wish to receive climate information, CCAFS baseline survey.



Communication channels

Male and female respondents revealed the same desired format for the provision of climate information. Visits from extension agents have been cited as their first preferred format to receive climate information, particularly in Nsanje and Zomba. Half of the respondents have chosen "visits from extension agents" in these latter districts while in Lilongwe around 30% have chosen this format. The second most frequently cited format is by radio message, as reported by an average of 20% of respondents. Lilongwe exhibits the highest percentage (26%) of interviewees who have selected radio as their second choice. SMS by cell phone is the third choice across districts. The same pattern is also observed in key informants. The use of SMS to deliver climate information is already experienced in Nsanje district (Figure 22).

Figure 22: Format preferred to communicate climate information, CCAFS baseline survey.



The meteorology department MDCCMS communicates climate information using cell phone calls and SMS to community leaders and NGOs. NGOs send SMS to all community members who have registered for their services. This system tends to be used mostly for warning households of the risk of flood.

Figure 23: Households' communication asset ownership by district, CCAFS baseline survey.

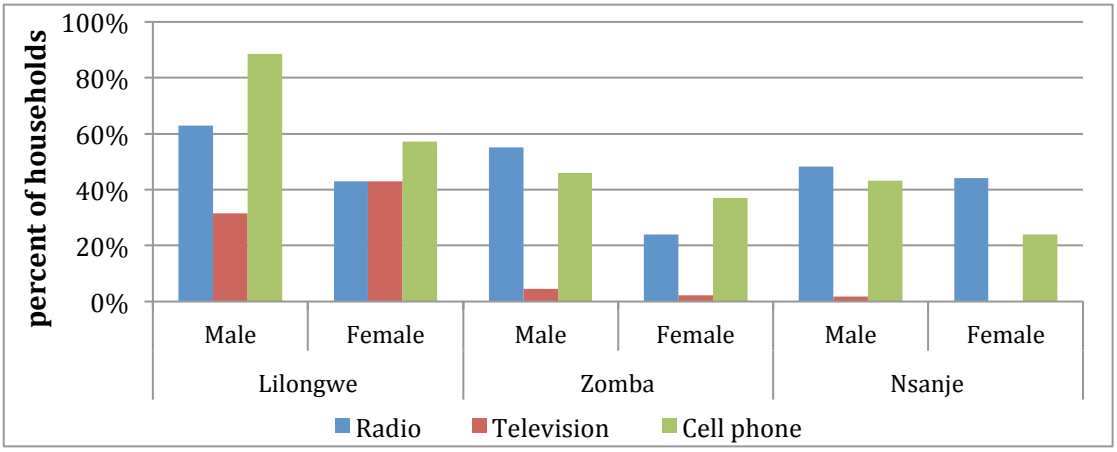


Figure 24: Ownership of mobile phone. Farm Radio Scoping Study.

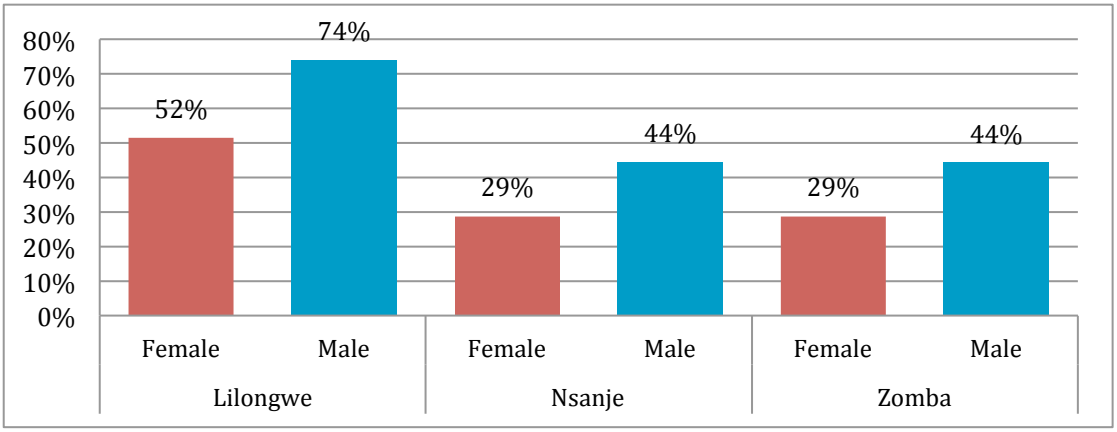
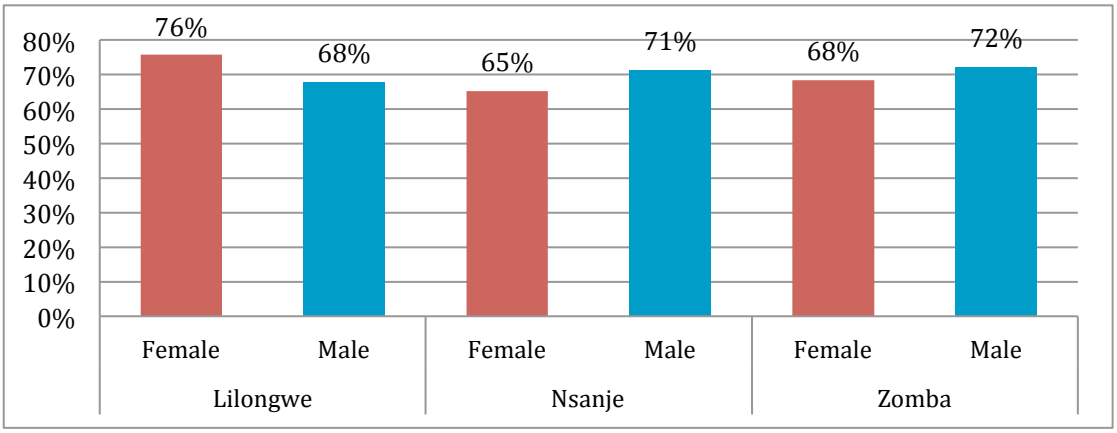


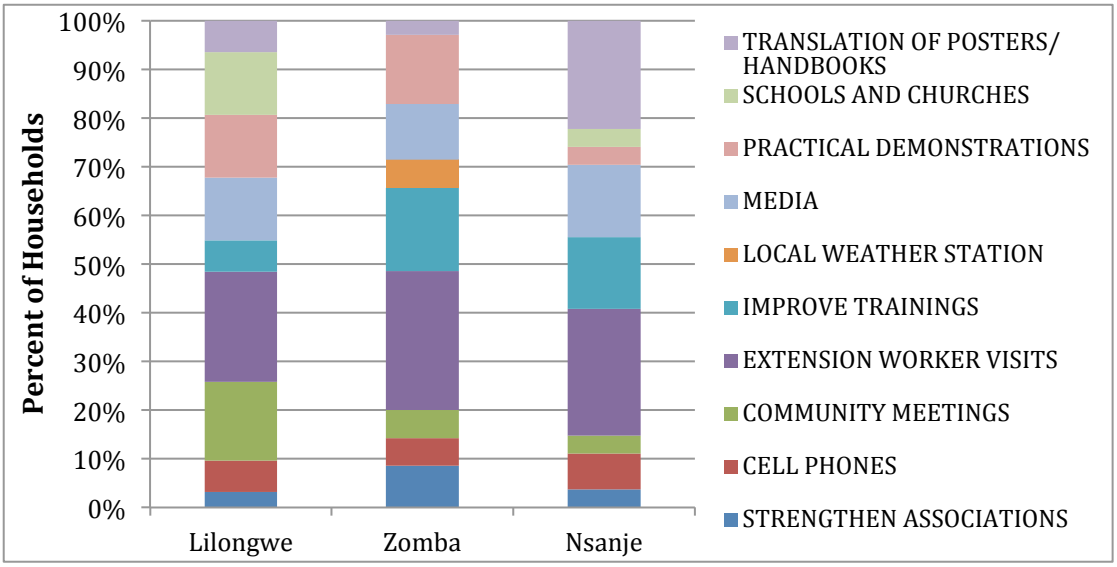
Figure 25: Access to mobile phone by those respondents who do not own one (n=357).



Ways farmers want climate communication improved

In Nsanje and Zomba, key informants have more often suggested that increased visits (29%) and training of extension workers (17%) will be very effective in improving climate information communication (Figure 26). They have also identified practical demonstration (14%) and media (11%) as strategies to improve communication. Other ways include localized climate information through local weather stations, use of media and community meetings. According to key informants, the meteorology department and government extension services should have more effective linkages. Government extension workers are sometimes limited in providing farmers with the most up-to-date climate information. They believe this can be improved through better coordination and linkages between these arms of government. Further, they have declared that community meetings can be very effective ways to disseminate information because in the villages surveyed there is usually a big turn up for community meetings, especially called by village chiefs.

Figure 26: Ways key informants suggested communicating climate information, CCAFS baseline survey.



Conclusion and Recommendations

Several key insights can be derived from this analysis and inform the design of climate services activities in the districts targeted by the GFCS Adaptation program for Africa. First, climate information communication to households should rely preferably on radio and extension workers both from the government and NGOs. Second, training key informants, particularly extension workers, in understanding climate forecast concepts and integrating

them in agricultural activities is essential for effective communication of climate information services in support of farm decisions. Third, supplying the markets with farm inputs will enable farmers to act on the climate information received. Fourth, farmers request the following climate information in support of their farm decisions, coupled with agiruclltural extension support: information on the onset of rainfall, frequency of extreme events, distribution of rainfall over the agricultural season and the end of the rainy season. Fifth, traditional indicators should be valued and integrated to the conventional climate forecasts to promote farmers' use of scientific climate information in conjunction with their own indigenous knowledge. Finally, dialogue between national meteorology services, extension agents and farmers will represent an effective platform for the co-production and delivery of relevant and useful climate services for end-users.

The analysis also supports several recommendations for improving the supply, delivery, and iterative feedback and improvement of climate services in Malawi.

To improve the supply of useful services, first develop climate service products to be responsive to farmer needs. Second, indicate value and integrate traditional indicators with the conventional climate forecasts to promote farmers' use of scientific climate information in conjunction with their own indigenous knowledge. Finally, co-produce services with agricultural experts: establish a dialogue between national meteorology services, extension agents and farmers. This will represent an effective platform for relevant and useful climate services for farmers.

To improve the delivery of climate information and advisories, climate information communication for farmers must rely on radio and extension workers both from government and NGOs. Extension agents should also be trained in understanding climate forecast concepts and integrate them into routine extension support.

Rigorous evaluation of climate services is a requirement for improving the usefulness of the services delivered. First, conduct post-season reviews to capture farmer feedback on received services. Second, continue to track climate information access and use at the local level, and changes against the baseline.

This summary of CCAFS baseline findings from Malawi reveals the current state of climate information use at the local level, gaps and needs of farmers before they can benefit from improved science-based climate information, identifying the role of ICTs and rural radio to reach marginalized rural communities. It is our hope that these findings will offer valuable insights to the GFCS Adaptation Program in Africa, and future projects working to scale up relevant climate services for farmers and pastoralists in the country.

References

Coulibaly, Y. J., Kundhlande, G., Tall, A., Kaur, H. and Hansen, J. 2015. What Climate Services Do Farmers and Pastoralists Need in Malawi? Baseline Study for the GFCS Adaptation Program in Africa. CCAFS Working Paper no. 112. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

Guntunku, D., Sharma, V.P., Tall, A., Kaur, H., Mishra, N. and Hansen, J. 2015. Leveraging the Power of ICTs to Scale Up Climate Information Services in Malawi and Tanzania: Scoping Study for the GFCS Adaptation Program in Africa. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. In press.

Hampson, K.J., Chapota, R., Emmanuel, J., Tall, A., Huggins-Rao, S., Leclair, M., Perkins, K., Kaur, H. and Hansen, J. 2014. Delivering climate services for farmers and pastoralists through interactive radio: scoping report for the GFCS Adaptation Programme in Africa. CCAFS Working Paper no. 111. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: www.ccafs.cgiar.org

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