

Strengthening Agricultural and Nutrition Extension in Malawi (SANE)



Digital Agricultural Extension in Malawi: Rollout of the Extension Helper App

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Background and Justification

The Feed the Future (FTF) Malawi Strengthening Agricultural and Nutrition Extension activity (SANE) is a five-year engagement between the University of Illinois at Urbana-Champaign (UIUC) and the United States Agency for International Development (USAID) Malawi. The Ministry of Agriculture, Irrigation, and Water Development (MoAIWD)'s Department of Agricultural Extension Services (DAES) is the key Government partner. SANE operates in Malawi's 10 Feed the Future (FTF) Expanded Zone of Influence (E-ZOI) districts, as seen in Figure 1.

Activity efforts focus heavily on strengthening the implementation of the Government of Malawi's (GoM) National Agricultural Extension Policy (NAEP) and strengthening the District Agricultural Extension Services System (DAESS) introduced by the policy (SANE, 2019). DAESS uses a pluralistic Agricultural Innovation Systems approach and relies on the support of diverse stakeholders to function properly. DAESS has platforms for stakeholder engagement at village, Area, and district levels, namely the Village Agricultural Committees (VACs), Area Stakeholder Panels (ASPs), District Stakeholder Panels (DSPs), District Agricultural Extension Coordinating Committees (DAECCs), and District Agriculture Committees (DACs), where communities identify key needs and hold service providers accountable for addressing them (GoM, 2000).

Extension systems are becoming increasingly pluralistic, resulting in a variety of actors that provide services to farmers. However, diverse actors operating in the same physical space often lack coordination and some farmers receive more extension services than others do. Improving coordination can therefore improve the coverage of extension workers to reach farmers, yet is often constrained by basic data on who is doing what, where, and with whom.

Extension workers in Malawi are tasked with conducting regular Monitoring and Evaluation (M&E). This practice is often cumbersome and characterized by poor and subjective data. Field staff typically submit hand-written reports that describe activities conducted and farmers served, but without validation or impact monitoring. This approach makes it difficult to accurately measure the effectiveness of program interventions. In addition, extension managers have little ability to verify the activities and farmer contacts described in these reports actually occurred, which reduces the value of M&E data to guide programmatic decision-making.

Malawi's National Agricultural Extension Policy (NAEP) encourages the development of stakeholder platforms as a way of aggregating farmers' needs and conveying them from the household level up to district and national levels where programmatic and policy decisions take place (GoM, 2000). However, data collection from stakeholder panel meetings and communications to other levels of the system are often very weak, leading to less-than-ideal implementation of the demand-driven approach.

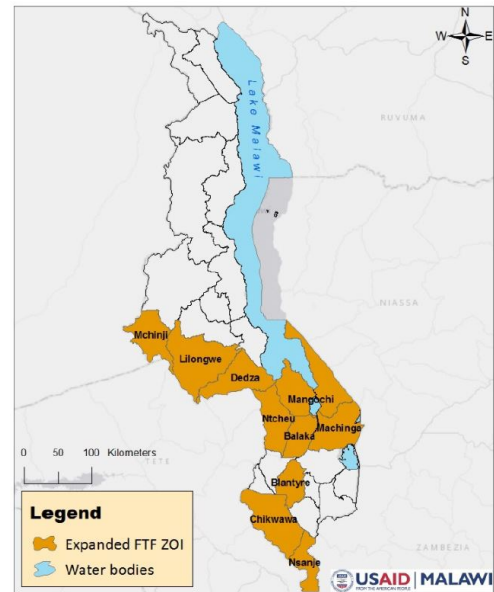


Figure 1: USAID/Malawi FTF E-ZOI

By incorporating mobile technology when collecting and disseminating agricultural information in the field, extension services can rely on:

1. Data that more clearly shows the activities of different extension actors, resulting in improved coordination, reduced oversaturation of services to some communities while increasing services to under-reached ones, and improved value for money in extension systems;
2. Improved tracking of extension worker activities, which strengthens M&E, allows for improved accountability and performance of front-line extension workers, and increases the use of result-based program planning in extension;
3. Improved data collection and quality, which promotes communication of outcomes of stakeholder panels to platforms higher along the DAESS.

District Agricultural Extension Services System (DAESS)

DAESS platforms (Centre in Blue) are aligned to Ministries of Local Government and Rural Development (MoLGRD, Left in Grey) and supported by Ministry of Agriculture, Irrigation and Water Development (MoAIWD, Right in Green)

Ask your MoLGRD or MoAIWD representative who the DAESS platforms chairs are for your district / level.

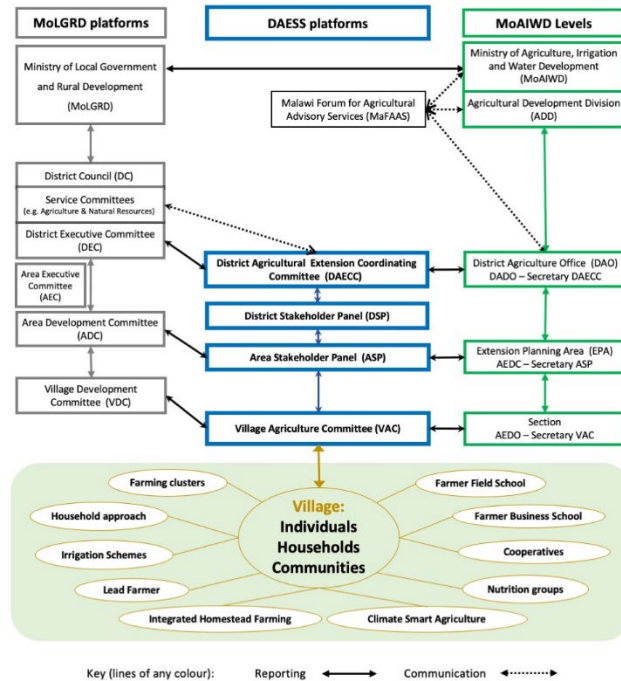


Figure 2: DAESS Structure as outlined in NAEP

The dynamics of this pluralist extension system, as put in motion by the NAEP, necessitates the use of a digital approach to strengthen its implementation. Information Communication Technologies (ICTs) have been recognized as an appealing medium for service provision in places where clients significantly outnumber extension workers (Swanson, B. E., & Rajalahti, R., 2010). SANE recognizes this need and has utilized other digital tools in extension planning.

In 2018, the SANE activity conducted a case study and produced a report entitled “Exploring Access to Videos for Extension” with Dedza, Lilongwe, and Mchinji DAESS platforms. The case study highlights ICTs as an appealing extension medium, especially in contexts like Malawi where farmers significantly outnumber extension workers and many farmers receive little to no face-to-face engagement (Awolola and Markstahler, 2017). Based on the results of this intervention, the Extension Helper app was developed to make extension services more accessible and extension systems more efficient for a stronger demand-driven approach.

The AgReach Extension Helper app is a multi-faceted ICT tool designed to:

1. Improve extension workers’ ability to teach farmers, towards improved adoption of beneficial technologies and practices;
2. Improve data quality towards better M&E and evidence-based planning;
3. Improve coordination, efficiency, and cost-effectiveness of services through mapping activities to determine areas of oversaturation and where access is low.

The purpose of this activity is to pilot, receive feedback, and scale up the Extension Helper App with Area- and village-level platforms (ASPs and VACs) and their Extension Workers.

Approach and Methodology

The Extension Helper App was rolled out in Malawi in collaboration with DAES actors and frontline extension workers. The guiding principles behind the rollout are shown in the following Theory of Change (Figure 3):

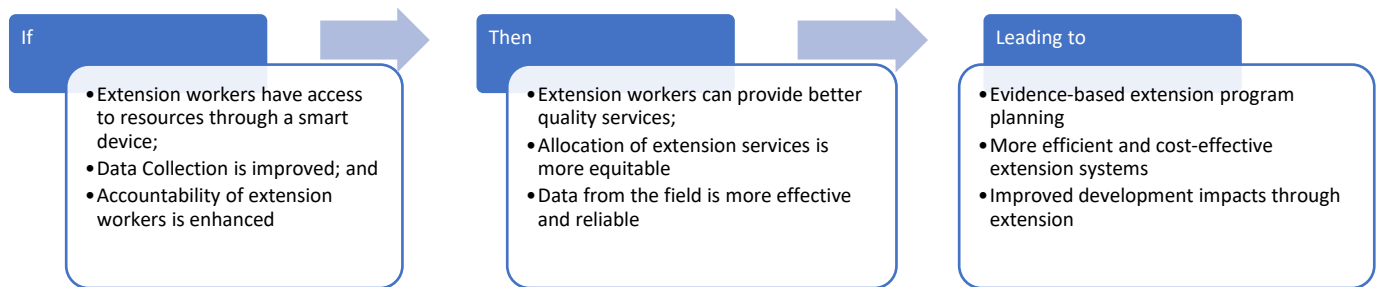


Figure 3: Extension Helper App Theory of Change

The rollout activity's Theory of Change aligns app functionalities and features to demonstrate the impact pathways associated with the use of the app in extension planning and service provision, that ultimately lead to desired outcomes. The Extension Helper App approach works to improve extension workers' access to knowledge resources, via a smart device, while enhancing the accountability of each frontline extension worker through improved data collection and validation. Meeting these conditions ensures that frontline workers provide higher quality services, while collecting more effective and reliable field data, in a more equitable manner, in a pluralist extension landscape. Progress in these areas contributes to evidence-based extension planning, more efficient and cost-effective extension systems, and improved development impacts through extension.

Participant Selection

During this pilot, four ASPs were chosen to receive the app treatment due to their proximity to Lilongwe City and the availability of android devices. One ASP was in a rural area with limited communication infrastructure, which will allow the app development team to test functionality outside of a cellular coverage area. A preliminary meeting with DAES actors on was held on 4 July 2019 to present the rollout approach.

During this meeting, DAES actors named the four ASPs¹ to receive the app package. Agricultural Development Extension Coordinators (AEDCs) hold key roles in ASP leadership and supervise frontline extension workers working in their Extension Planning Area (EPA). AEDCs were asked to form a team of five Agricultural Extension Development Officers (AEDOs) to receive the app package. This was done to use for the rollout the leadership's familiarity on which AEDOs count on an android device.

¹ Mazengera-Nkhoma ASP, Chitukula ASP, Tsabongo ASP, Kalolo ASP



Installation and Trainings

App trainings took place during scheduled field visits. Because personal android devices were required to run the application, ASP secretariats were encouraged to form a team of five frontline extension workers (AEDOs) to receive the app package.

Installation of the app took place at the beginning of trainings via Bluetooth Transfer. Following the first installation, the extension worker then shared the app with other members of the group to expedite the process, a method which showed extension workers how to share the app with other frontline workers. During training sessions, frontline extension workers were trained on the three data collection functionalities of the app: individual field visit, group farm visit, and stakeholder platform visit. A list of specific fields within each function can be found in Box 1.

Trainings were done using a role-playing activity where extension workers were placed in pairs and asked to be both an AEDO and a “farmer” who would provide information for the purpose of practicing. Using a role-playing method allowed for the training participants to practice ways of asking farmers for the information requested through the applications, while also receiving the farmer experience of being asked the questions. The first two trainings were led by a SANE staff member, with support from a staff member of the Agricultural Communications Branch of the DAES. The last two trainings were led in Chichewa by the DAES staff member. By having a member of the DAES at the trainings, the value of the app package would be better relayed to DAES actors by someone from within the DAES itself.

At the end of each training, a WhatsApp group chat was created to allow for extension workers to send questions about the app, emphasizing collaboration within the AEDO cohorts. During field visits, training participants were eager to help their fellow AEDOs in using the application. These AEDOs should be key players in further rollout of the application, perhaps by participating in a training of trainers.

Box 1: Data Collection Functions

Individual Farm Visit

Farmer-Specific

- a. Farmer Info and Demographics
- b. Farm Information
- c. Farm Location

Visit Specific

- a. Visit Info and Focus
- b. Finances and Yields
- c. Farmer’s Questions

Group Farm Visit

Visit Info and Focus

- a. Technical Focus
 - a. Crop Production
 - b. Market Orientation
 - c. Group Dynamics
 - d. Natural Resource Management
 - e. Nutrition
- b. Group Information
 - a. Attendees
 - b. Attendee Roles

Stakeholder Platform Meeting

Platform Information

- a. Date
- b. Duration
- c. Topics of Meeting

Platform Location

- a. District
- b. Area
- c. Village Name
- d. Village GPS Coordinates

SOP Checklist

Attendee Information

- a. List of Attendees
- b. Attendee Roles
- c. Attach Picture of Attendee List

Platform Meeting Minutes

- a. Attach Picture of Minutes

Preliminary Results

Preliminary data aggregated from frontline workers demonstrated the app's potential to centralize, streamline, and validate data from the field. Furthermore, frontline worker field activity was properly recorded and resulted in heat maps that showed areas of activity and frequency, with darker areas representing locations frequently visited by the frontline worker. Figure 4 shows places where the app was opened and utilized by one of the participants of the pilot.

Despite the success in recording frontline worker movement, demographic information collected from farmers was weak, or incomplete, for several extension workers. This was due to other work obligations planned during the rollout.

A main objective of this activity was to collect data from farmers that would better inform decision-making at the National level. However, the number of farmers whose demographic information was properly delivered to the management portal was insufficient and could not be deemed representative of the entire population. More consistent use of the app could help address this issue.

The app and management portal both have proven their capacity to inform decision-makers using data from the field. This can be broken down into categories of information from types of actors, to types of visits, and number of visits per district. The management portal is key to interpreting and analyzing data reported from the field. An example of maps and charts generated by the management portal can be seen in Figure 5. From these, program managers can target interventions where services are most needed and reduce areas of over-saturation, thereby improving cost-effectiveness and impact.

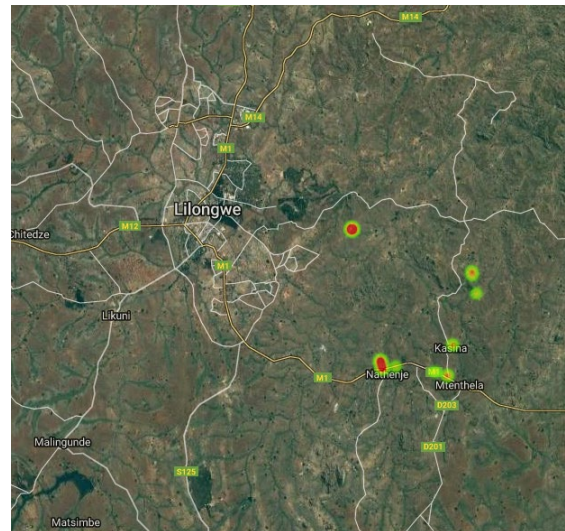


Figure 4: Frontline workers' interactions with farmers provide GPS coordinates of sites visited and with which frequency, giving insight into service coverage, while improving accountability.

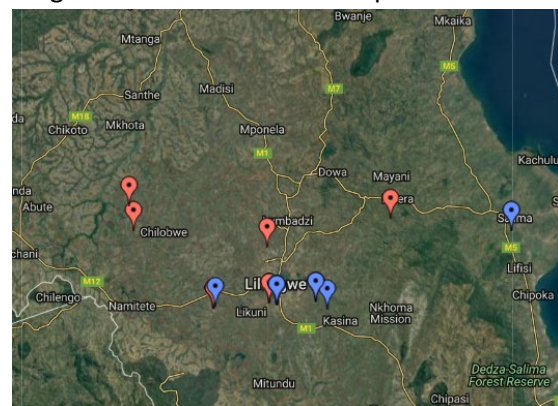
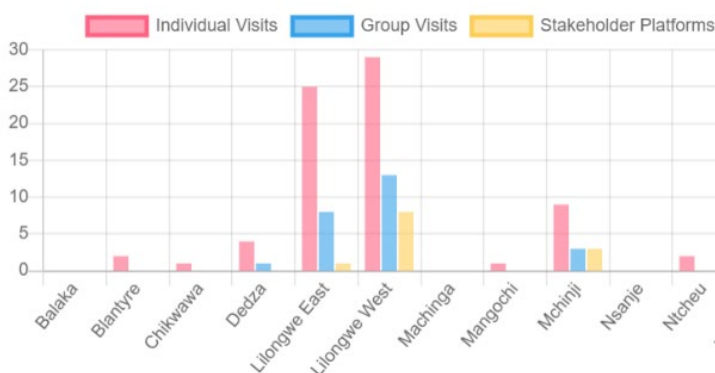


Figure 5: Field visits by frontline workers produce data to address both oversaturation of services, and gaps in service provision per district.

Responses from Frontline Workers

A feedback visit was scheduled a week after the app trainings to generate feedback from the frontline workers. Focus group discussions were used to understand the appropriateness of information collected, and to measure the adoptability of the app by the frontline workers. It is important to note that, due to this app being in beta testing stage, feedback on functionalities was also crucial for improving the app. Feedback from both the DAES and the frontline workers will support the tailoring of this app to Malawi's extension landscape.



Figure 6: AEDOs from Chitukula ASP during a feedback session, as they sync their devices to the server

WhatsApp group chats were used to schedule the feedback visits. Since public extension workers often have responsibilities outside of planned extension activities, feedback visits were difficult to plan within the timeframe of the activity. In some EPAs, feedback visits were delayed due to scheduled household survey activities and data reporting to the district.

Adoption by frontline workers is key in ensuring adoption by the management-level users. Overall, the app and its interface were well received. Since the app is intended to indirectly lighten the extension workers' workloads, feedback session questions were centered on whether or not the AEDOs felt the app was a valuable tool to use in their programming. There was a sense of excitement amongst the extension workers as they noticed the increased promotion of technology for extension planning. One

Box 2:

Stakeholder Responses

From AEDOs

“Very helpful, and motivates you to go to the field.”

“Most of the times we are confused about reports and such, this will inspire us to go to the ground.”

“Good approach, especially because we are moving forward with technology.”

“We can serve and send information up to the government and down to the villager.”

From DAES

“This is a very good app and this is where extension should be heading to. It will help change the mindsets of the extension worker through improved accountability and user tracking...so that the front end officers are able to understand the importance of their work and the importance of the data.” – Blessings EMO

“I think this app is good and will boost performance by extension workers”

extension worker said they felt encouraged to go to the field and engage with clients, having realized the usage of geolocation and GPS pins documenting farmer visits. More quotes and responses from stakeholders are recorded in Box 2.

While extension workers were excited about readily available resources, such as training videos and technical sheets, they requested a feature that would facilitate communication from the frontline worker to someone from the DAES to directly request additional resources tailored to the farmer.

Extension workers were also excited that their supervisors could compare their work to that of their peers. Extension workers in Malawi take pride in their vocation, and commending good work done by extension workers will encourage them to continue their work, resulting in quality services being delivered to their community. This will be the focus of a forthcoming study planned for 2020.

Responses were organized by theme as follows:

Frontline Worker Activities

Many AEDOs felt that the app was a good way of encouraging them to go to the field. However, they saw the app as limited in its ability to fully capture the work they are engaged in within their sections. This echoes a previous criticism received by the DAES on the need for more functionalities that record *other* extension methodologies outside of field visits, such as campaigns, field days, village meetings, etc.

Data Collection

While an open field option was written in the Farm Information form to allow frontline workers to record observations outside of the pre-determined lists, there was an expressed need for more open fields throughout all data collection fields. This would allow for more detailed observations from the frontline workers. However, such a feature would require middle managers to filter and regularly monitor submitted information.

Technical Limitations

The extension helper app was designed to be fully functional with or without internet connection.

Despite infrastructure limitations developers had in mind, internet is required in three specific instances: (1) upon frontline worker registration, (2) when downloading resources from the toolbox, and (3) when syncing farmer data to the server. Since the app is able to be shared and installed via Bluetooth, it can be disseminated initially amongst frontline workers. However, the installation process further revealed a

compatibility limitation on devices running Android Firmware 8.1 and above. This issue will be addressed within the next edition of the app.

Internet connectivity proved to be a unique constraint that necessitated the purchase of a portable hotspot (Airtel MyFi) by the Activity. Frontline worker registration requires either an authenticated Google account pulled from existing accounts within the android system, or the entry of a personal email without Google authentication. The latter method of registration is meant to allow extension workers who do not have an email address to use the app. Since email addresses are used to create user identities within the server, and not necessarily to send messages, the email can be a dummy address. This can be seen in Figure 7, although authenticated Google addresses are preferred.

Prioritizing Extension Helper App Activities

During the feedback sessions, it became apparent that frontline workers were engaged in activities that were outside the scope of the app. This resulted in limited collection of demographic information that could have been used for planning purposes. Not only does this further emphasize the need for an app that better encompasses the breadth of extension methodologies and activities a frontline worker is engaged in, but it also highlights the need for collaboration and communication with the DAES leadership to ensure that there are no previously planned activities taking place during the rollout.

Response from the DAES

The Department of Agricultural Extension Services will be responsible for the management side of the app. A debrief session took place following the installation and initial feedback sessions from the extension workers, showcasing heat maps and activity graphs resulting from the pilot. DAES actors were impressed with the functionality of the app, and provided recommendations for improved accountability of managers.

Supervisor Accountability

A supervisor accountability mechanism, such as a “last visit” time stamp from the management portal, would ensure that middle-level managers (AEDCs) and upper-level managers at the National level, are tracking submissions from frontline workers, effectively securing and strengthening the flow of communication from the field level to the Area and National level.

Scope of Data Collection

DAES actors further recommended that the tool would include more open-ended fields to better document farmer visits by extension workers. DAES expressed an interest in learning the rationale behind farmers engaging in certain activities, as well as a more detailed mapping of service providers and the areas they are engaged in. This validates the notion of data-driven planning for cost-effective extension planning by reducing services in oversaturated areas, and addressing communities with limited service providers.



Recommendations

The potential of the Extension Helper App is recognized by frontline users, actors within management, and international actors alike. Addressing feedback from frontline workers, while working with those in middle- and upper-management positions to adopt this approach, will better position the Activity for a successful rollout at the National level in 2020. The team of specialists that will be leading the rollout of this app should each be focused on backstopping one specific level of the system, including frontline workers, middle managers, and national administrators. This will ensure stakeholders' access to support by an identified specialist. Working with stakeholders from all levels highlighted broader areas for improvement, and several recurring patterns of concern were revealed:

Strengthened Middle Management

Backstopping middle management will ensure frontline workers are properly using the app, and allow them to utilize the management portal effectively. A unique feature of the Extension Helper App is its ability to assign an extension worker to a manager, and for the manager to oversee the activity of their team on the management portal. In the Malawian context, the AEDC oversees a cohort of frontline workers in their Extension Planning Area. Middle managers will require support and training that is tailored to the management side of the application, further emphasizing the need for level-specific specialists. A training that focuses on middle-level management functions must also take place, as opposed to providing training alongside frontline staff.

Training National Administrators

High-ranking staff from the DAES should be identified and provided with a training on the management portal for the app. Government stakeholders are intended to be key actors in the national rollout. As management portal administrators, DAES staff will be able to see data from all the districts. Identifying the staff responsible for overseeing data sent from the field-level should be done prior to arrival in-

country. Ensuring that they count on the proper equipment, and data analysis methods, will enable investigators to validate the effect of the app on the quality of extension services. The management portal is designed to be user-friendly, and provides figures that can be easily interpreted. However, the data being reported from the field can be proven further useful if staff are capacitated to fully exploit it, interpret it, and generate informed reports using the management portal.

Private-Sector Engagement

The private sector in Malawi could be leveraged to support use of the app. Malawi's extension landscape includes both public and private extension service providers. Malawi has a wide range of for-profit companies that operate in the agricultural sector. Some of these companies provide extension services to farmers. Key private sector actors that provide extension services operate in the tobacco, cotton, tea, sugar, and grain industries (Simpson et al., 2012). Private sector engagement will be crucial in mobilizing costs. This can be done through a licensing model where the GoM can provide licenses for private-sector agribusinesses, who can use the app package to coordinate their extension services, while also providing information on where private extension workers are operating. This additional revenue stream can help offset the costs associated with running the app while also fostering public-private partnerships. Farmers World is one of Malawi's fastest growing agricultural input distributor who also provides extension services to clients who need it. During the final week of the rollout, a staff from Farmers World contacted the Activity, under the recommendation of USAID AOR, expressing interest in the app package. Collaborating with Farmers World during the rollout will allow us to not only expand the scope of the study outside the SANE districts, but also create a precedent that promotes public-private partnerships.

Airtel can also present itself as a key partner for the rollout. The telecommunications firm is the market leader in Malawi with a market share of 72% (Airtel, n.d.). Communication has taken place with Airtel regarding subsidies on data for government extension providers. This will help reduce the average cost per user through increased user bases. This can be appealing to Airtel given the increased subscriptions and network users, in addition to brand recognition as a sponsoring partner in development activities. While Airtel is the market leader, it is a foreign company. TMN is a Malawian-owned communications provider that has been growing in recent years (Reuters, 2019) and might be more inclined to support Malawian extension services.

Lack of Digital Infrastructure

The availability of smartphones capable of supporting the app package, and withstanding continued use in the field, is a constraint that has been identified by all stakeholders. Frontline workers, government actors, and project donors have all expressed this concern. In addition, Malawi's telecommunication infrastructure may limit the scope of future activities, as well as the timeliness of data transmission if cellular reception is not available in remote areas. The team of developers will be working on expanding the compatibility of the app package to support as wide a range of firmware as possible, with the possibility of creating an iOS version of the app as well. While internet connectivity remains a constraint, its limitations can be mitigated. This can be done by allowing for a user profile to be housed locally (in the device), then added to the server upon syncing for the first time, thus allowing the user to take advantage of the app without requiring internet for initial registration. Battery life of personal devices was also brought up as a concern.

References

Awolola, Y., & Markstahler, C. (2018). Exploring access to videos for extension. SANE Case Study, 1-7.

GoM-Government of Malawi, Ministry of Agriculture and Irrigation, Department of Agricultural

Extension Services. (2000) Agricultural extension in the new millennium: Towards pluralistic and demand-driven services in Malawi. Policy Document. Retrieved from

<https://cepa.rmportal.net/Library/government-publications/Agricultural%20Extension%20in%20the%20New%20Millennium-%20Towards%20Pluralistic%20and%20Demand%20Driven%20Services%20in%20Malawi%202000.pdf>

Reuters. (2019, April 25) Malawian telecoms company TNM's 2018 profit up 27 percent. Retrieved from

<https://www.reuters.com/article/tnm-results/malawian-telecoms-company-tnms-2018-profit-up-27-percent-idUSL5N227469>.

Simpson, B. M., Heinrich, G., & Malindi, G. (2012). Strengthening pluralistic agricultural extension in

Malawi. Modernizing Extension and Advisory Services.

Strengthening Agricultural and Nutrition Extension. (2019, October 31). Annual report - Year 4: October

1, 2018-September 30, 2019(Rep.). Illinois.

Swanson, B. E., & Rajalahti, R. (2010). Strengthening agricultural extension and advisory systems:

Procedures for assessing, transforming, and evaluating extension systems. Washington D.C.: The

International Bank for Reconstruction and Development/The World Bank: Agriculture and Rural

Development: Discussion paper 45.