



Technical Brief

Upgrade & Scale of a Digital Call Centre for Reaching Smallholder Farmers in Sudan



TECHNICAL BRIEF: UPGRADING AND SCALING DIGITAL CALL CENTRE FOR REACHING SMALLHOLDER FARMERS IN SUDAN

JULY 2023



The Digital Advisory Support Services for Accelerated Rural Transformation (DAS) Programme is a facility funded by a grant from the International Fund for Agricultural Development (IFAD). The DAS consortium of partners includes Development Gateway: an IREX Venture, TechChange, and JengaLab.

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ABBREVIATIONS

ACL	Access control list
API	Application programming interface
CRM	Customer relationship management
DAS	Digital Advisory Support Services Grant
DG	Development Gateway: An IREX Venture
IAMDP	Integrated Agricultural and Marketing Development Project
ICT	Information and communication technology
ICT4D	Information and communication technology for development
IEC	Information, education, and communication
IFAD	International Fund for Agricultural Development
MFI	microfinance institutions
ToT	Training-of-trainer

BACKGROUND

The Digital Advisory Support Services for Accelerated Rural Transformation (DAS) Programme is a demand-based facility funded through a grant from International Fund for Agricultural Development (IFAD) to provide technical advisory support for information and communication technology for development (ICT4D) activities within IFAD-financed programmes across Africa, the Middle East, and Central Asia.

The DAS programme's main objectives are i) to increase access to information and inclusive financial services for smallholder farmers and ii) to increase the use of ICT4D solutions to achieve better targeting, monitoring, and impact measurement for agricultural development. Development Gateway (DG) completed an ICT assessment of the [Integrated Agriculture and Marketing Development Project \(IAMDP\)](#) call centre in El Obeid City, Republic of Sudan. The assessment identified barriers to digital adoption and mapped opportunities for scaling impact through the adoption of digital tools. To increase the reach and impact of the call centre, the assessment recommended an upgrade of the existing SMS and call centre to a client-relations management (CRM) system with the capacity to integrate with SMS/MMS and social media platforms and to support robust monitoring and reporting.

This technical brief outlines the requirements for the system, personnel, and other sustainability factors. While this brief was compiled to fit with the specific country and context requirements for the IAMDP project in Sudan, the concepts, recommendations, and considerations can be adapted and scaled for other environments as needed.

THE DIGITAL CENTRE'S CURRENT STATUS

The IAMDP digital call centre primarily consists of a bulk SMS messaging service sending out two messages every week to an estimated 3,000 farmers (for each message, 2,500 SMS messages are sent from the Sudani SMS platform and 500 from the Zain SMS platform). The call centre reaches 12.5% of the estimated 24,000 farmers living within the 98 project localities. The messages shared include: i) seed and farm inputs, ii) crop protection and harvest management, iii) market access and price negotiations, and iv) agricultural financing. Community focal points have started collecting contact information to facilitate the establishment of WhatsApp groups.

Key Challenges

A focus group discussion between the IAMDP team and call centre team at El Obeid in 2022 identified the following challenges:

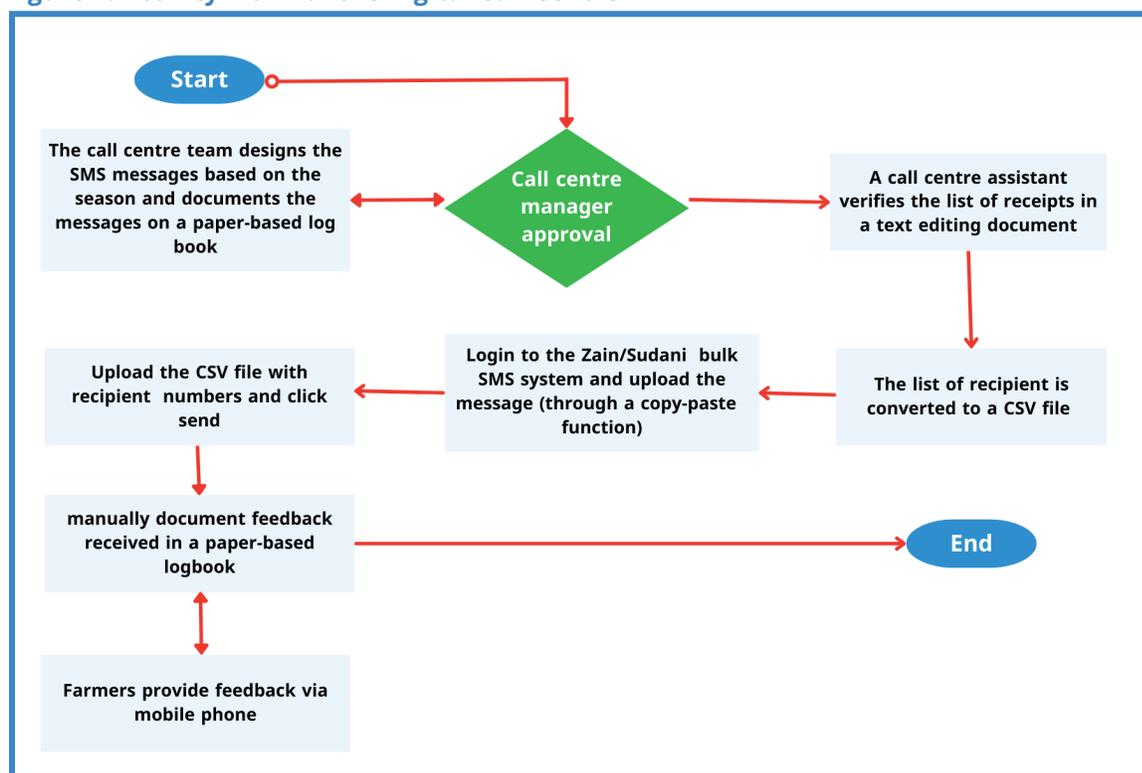
- The digital call centre uses a manual process with a separate bulk SMS messaging service for dissemination.
- There is no linkage between the SMS service and the manual content creation and management processes. This slows down the knowledge management and learning process of the programme.
- The call centre does not have a digital mechanism for receiving, analysing, and managing farmer feedback. Feedback is managed in a handwritten, physical book.
- The system does not have analytics and reporting capabilities to improve data use and learning for the call centre.
- The system has a minimal reach through SMS and is not integrated with other forms of communication such as social media (Twitter, Facebook, and WhatsApp). This leads to limited impact among the youth who have higher digital literacy.

Call Centre Targets

The digital call centre aims to reach 24,000 farmers within the region through integrated messaging using i) SMS messaging; ii) radio talk shows; and iii) distribution of information, education, and communication (IEC) materials through WhatsApp.

The illustration below shows the steps taken by the centre to disseminate information to farmers within the programme.

Figure 1: Activity Flow for the Digital Call Centre



RECOMMENDATIONS & SPECIFICATIONS

There is an opportunity for digitisation, which would save time, increase the quality and volume of messaging and improve targeting by automating call centre functionalities and integrating analytics and feedback capabilities. The study proposes the following areas for support and scaling to reach a critical mass of the farmers in the target region.

Upgrade and Modernisation of the Digital Centre

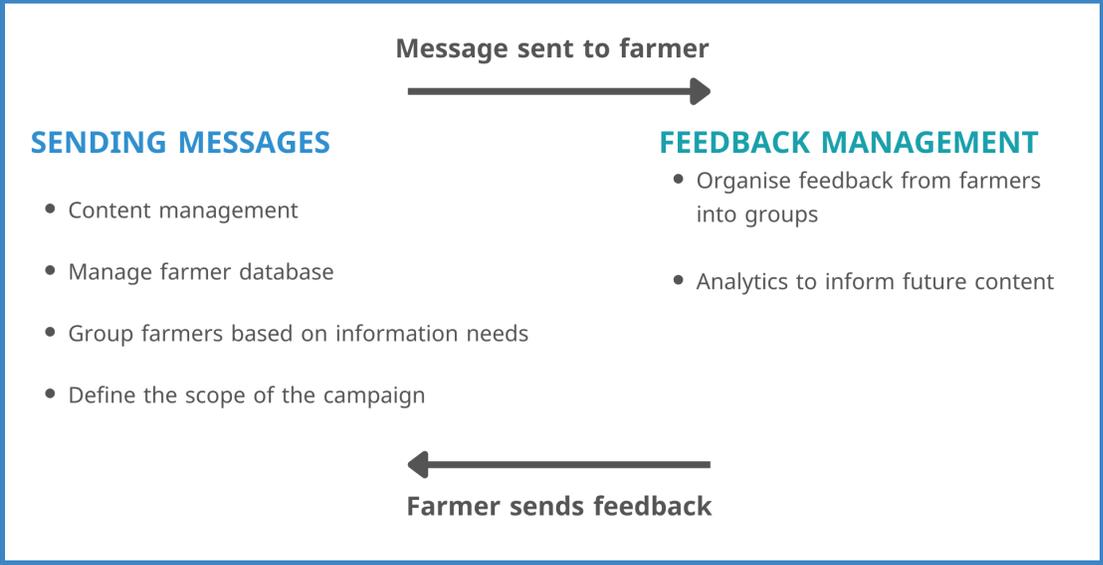
The study recommends the adoption of an open-source call centre software that integrates call centre functionalities with analytics and feedback capabilities. We recommend CiviCRM,¹ an open-source Constituent Relationship Management (CRM) platform. The CiviCRM instance which is depliable via WordPress and other website content management systems will replace the current manual content generation and feedback management process. Considering the programme plans to set up additional call centres at the state level and hand over the management of these centres to government extension officers, digitisation to improve the efficiency of running these centres is paramount.

The study found that CiviCRM, through an application programming interface (API), can be integrated to the Sudani and Zain backend, making it more efficient to send messages and manage farmer feedback.

¹ <https://civicrm.org/>

Additional requirements to run CiviCRM include internet connectivity (WordPress can be stable with low/slow internet), installation of a web browser such as Google Chrome, and a server to host all the data collected and saved. A technical consultant will also be required to install the solution and, where possible, integrate the Zain/Sudani APIs with the CiviCRM solution.

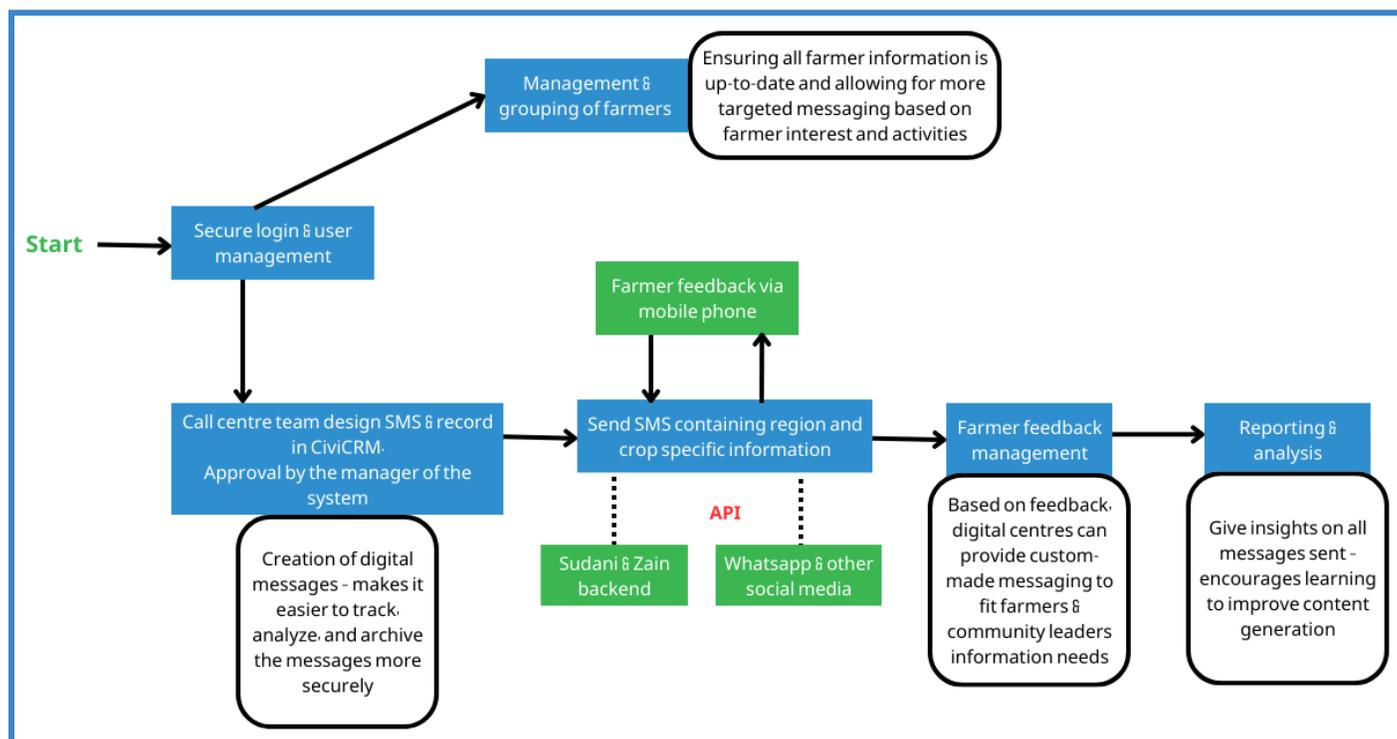
Figure 2: Call Centre Open-Source Solution



Recommendation for Contact Relations Management System

CiviCRM is an open-source customer relationship management (CRM) software developed by CiviCRM LLC. The software is a web-based, highly customisable CRM released under the [GNU Affero General Public License version 3](#) (GNU AGPL v3). CiviCRM LLC developed the system for the not-for-profit sector.

Figure 3: Proposed CiviCRM Workflow



Efficiency Gains of Adopting CiviCRM

Adopting CiviCRM will improve the efficiency of the digital centre by reaching more farmers without incurring high costs associated with off-the-shelf software. The study identified the following efficiency gains in the use of CiviCRM:

1. Save on staff time costs that would have been spent on contact information management by automating the farmer data collection and information management process.
2. Digitising the current manual message content creation and farmer feedback management processes will improve efficiency and further save on staff costs.
3. CiviCRM has automated monitoring and evaluation reporting and data analysis, saving the time needed to generate reports. Additionally, the analytics will support the digital centre team to have targeted messaging, ensuring staff time is efficiently used to directly address farmer needs.
4. Linking CiviCRM to WhatsApp as a medium of communication through community focal points will enable sharing of audio and video between the programme, the government, and farmers. This includes crop protection practices and other farming practices that are effectively

communicated to a wider audience through media such as audio and video.

Technical Requirements of CiviCRM

Server Requirements	A recommended server environment should typically meet these guidelines: Operating system: Linux CMS: Backdrop, Drupal 7, Drupal 9, Joomla, or WordPress PHP: 7.2, 7.3, 7.4 — with configuration and extension requirements. PHP 8.0 is supported from 5.40. PHP 8.1 is supported from 5.55 MySQL: MySQL 5.7.5+ or MariaDB 10.2+ — with configuration requirements
Hosting	CiviCRM's cloud hosting service called Spark is a quick and secure way to get started with CiviCRM. It allows you to get your installation of CiviCRM up and running in minutes. Spark is ideal for organisations of any size wanting to test and trial CiviCRM, or for smaller organisations and activities with up to 2,000 contacts. It's recommended that the system uses cloud storage to reduce the costs associated in setting up and maintaining a server. Alternatively, the human skills and capacities listed under "human capacity" below should be considered.
Human Capacity	If you have an internal IT department or staff member with a technical background, you may wish to host CiviCRM internally. To do this, you will likely need the following. <ol style="list-style-type: none">1. Servers or dedicated PC hardware available to run as a web server, 24x7.2. A space on premises to permanently store the hardware, possibly air-conditioned.3. An uninterrupted power supply (UPS) to ensure the server is still available during power outages.4. An internet connection suitable for hosting a website (static IP, sufficient bandwidth, etc).5. If the organisation does not have the human capacity, there are implementers and experts in the CiviCRM community who can manage the hosting and/or installation for you. If requested, they may also be available to manage a local implementation and configuration on your premises.
Integration Services	Some differences arise with distinctive features/norms in each CMS community, e.g.: In WordPress, it's common to embed content in your web pages using shortcodes. CiviCRM has several shortcodes in WordPress. In Backdrop CMS/Drupal 7/Drupal 9, it's common to embed content in your web pages using blocks. CiviCRM has several blocks in Drupal. In Backdrop CMS/Drupal 7/Drupal 9, CiviCRM makes use of the CMS's "roles" and "permissions" using the CMS's interfaces and approaches, and there are modules to synchronise CiviCRM groups and membership types to them. In Joomla/WordPress, "roles" and "permissions" can be managed using the CMS's interfaces and approaches. There are plugins to synchronise groups and membership types. CiviCRM also connects to WhatsApp business through a paid-for Civi-go-SAAS service.

Customisable Features of CiviCRM

User Management

A CiviCRM implementation is customisable using access control lists (ACLs) to allocate different users and different roles within different geographical regions. Two levels of administration, i.e. national-level and state-level administrators, can be allocated to manage access and use of the system. State-level staff can also update the contacts of focal points and extension officers, as well as update the locality assignments for the officers.

Figure 4: User Roles Example in CiviCRM

ACLs allow you to control access to CiviCRM data. An ACL consists of an **Operation** (e.g. 'View' or 'Edit'), a **set of data** that the operation can be performed on (e.g. a group of contacts), and a **Role** that has permission to do this operation. Refer to the [Access Control Documentation](#) for more info.

Label	Value	Description	Order	Reserved	Enabled?	
National Level Administrator	1		↓ ↓	No	Yes	Edit Disable Delete
State Level Administrator	2		↑ ↓	Yes	Yes	Edit

Powered by CiviCRM 5.55.2. System Status: Warning CiviCRM is openly available under the GNU AGPL License.
[Download CiviCRM](#) [View issues and report bugs](#) [Online documentation](#).

Administrators create user profiles, including the programme staff, state-level support staff, extension officers, and community focal points. Each of the user profiles is secured through a strong password and linked to an email to facilitate validation of the accounts.

Value: This functionality allows for local-level access by focal points and extension officers while managing the integrity of information at the central or national level.

Management and Grouping of Farmers

A CiviCRM implementation enables state-level support staff, extension officers, and digital centre staff to manage the farmers' details, including new contact details, updates crops of focus, and the size of land under farming (feddans), among other parameters. To allow targeted communication, users and beneficiaries of the system can be grouped into themes, geographical regions, and responsibilities. Some of the proposed thematic groups include extension officers, farmers, and administrators. Further, farmers can be grouped based on states, crops of focus, and microfinance institutions (MFI).

Value: This functionality allows for regular updates of farmer contact information and allows for more targeted messaging based on farmer interest and activities.

Creation and Dissemination of Information

The system allows for the creation and dissemination of farmer-, region-, and crop-specific information using platforms such as SMS/MMS/Whatsapp through a simplified process. The system has a built-in tracker for messages delivered and messages read and provides a linked feedback loop for farmers. Feedback from farmers can be linked to specific farmers to allow timely response and support.

Value: This functionality allows for the synchronised creation of digital messages, making it easier to track, analyse, and archive the messages more securely. Linking feedback from farmers with the messages sent maintains a closed loop of feedback and encourages learning and understanding of the use of the information disseminated.

Integration with Messaging Services

CiviCRM allows integration with SMS/MMS platforms using custom plugins and APIs. The system can further be integrated with social media platforms, i.e WhatsApp/Facebook, Twitter.

Value: Saves on time through direct linkage to Zain and Sudani platforms, hence encouraging automated messaging. Additionally, integration to WhatsApp and other social media platforms will improve the efficient dissemination of information to youth and community focal points.

Reporting

The system provides specialised reports based on campaigns completed within specific time periods. Monthly, quarterly, and annual reports are available from the system.

Value: These reports give insights on all the messages sent, encouraging learning to improve content generation.

Feedback Management

The system allows for tracking of feedback from specific farmers over time.

Value: This facilitates the dissemination of custom-made messaging to fit farmers' and community leaders' needs.

Proposed Implementation Process

To provide a sense of how long each step of the implementation process should be allotted, a timeline is included below.

Proposed Implementation Process

Timelines	Proposed Process of Implementation	Details of Activity
Short-term (2023)	Step 1: Decision on the adoption of CiviCRM	Build a case and consensus on the adoption of the system.
	Step 2: Establish a technical/steering committee	The committee should be chaired by the relevant state agency with the secretariat hosted by the IAMDP. Members are drawn from all other agriculture stakeholders in Sudan.
	Step 3: Contracting a consultant	A technical consultant will be selected to configure the system and develop training materials for the system.
Medium-term (Late 2023-2024)	Step 4: Piloting	Pilot the system in the four IAMDP focus counties.
	Step 5: Monitoring customisation and documentation of the system	Continuous improvement of the system including module customisation will be needed to fit the information needs of the stakeholders and farmers.
Long-term (2025-2026)	Step 6: Scaling of the system	Gradually scale the system to other available agricultural applications and regions.

Estimated Level of Effort and Resources Required

The implementation of the system will require hiring a technical consultant to configure the system, develop training materials, and support the rollout of CiviCRM. Table 8 below indicates the estimated level of effort and potential hardware requirements for the adoption of CiviCRM.

CiviCRM Configuration & Rollout Costs

Activity	Days/ Costs/ Requirements
Set up VPS Set up domain name Set up SSL certificate	0.5 days
Install WordPress with CiviCRM	0.5 days
Configuring CiviCRM: <ul style="list-style-type: none"> Define modules User definitions Metadata 	5 days
Application programming interface (APIs): <ul style="list-style-type: none"> Coordinate with telecommunication companies Configure APIs 	12 days
Train digital centre team	5 days
Roll out support	30 days
Hardware costs for new digital centres <ol style="list-style-type: none"> Cabling Hosting costs: VPS, 4GB RAM, 100GB Storage and 2 CPUs Computers 	To be determined during project implementation. ICT hardware to be purchased should be based on IFAD procurement and Sudan government ICT standards on specifications and pricing.

In addition to the above, a provision for an annual technical support contract for about 30 days per year is advisable for the consultant if the technical skills are not acquired in-house.

Capacity Building of Project Staff & Government Extension Officers

Digital Capacity and Analytics

This assessment proposes an integrated digital and data capacity-building programme on data use with the call centre software, data analytics, and reporting. Both current digital centre teams and the government extension officers who will be taking ownership of the digital centres will require training.

The provision of self-directed learning materials for the digital centre team and state government officers will ensure continuous learning efforts.

Build the Capacity and Strengthen Role of Focal Points

The assessment identified community focal points as an important human bridge to farmers who do not have access to mobile phones. Community focal points allow for dissemination of media content, such as videos, in community gatherings and the recruitment of new farmers to subscribe to and access information. To strengthen the role, capacity building of focal points on digital skills and content creation will be required, along with sustainability of the community focal points beyond the programme period to ensure continued support to the newly created digital centres at the state level. Self-directed learning materials for focal points will also scale the learning across the board and increase awareness and use of digital technologies.

Strategic Partnerships for Improved Access to Digital Information

We recommend following up with strategic actors identified to address challenges faced in access to digital services. Some of these actors include:

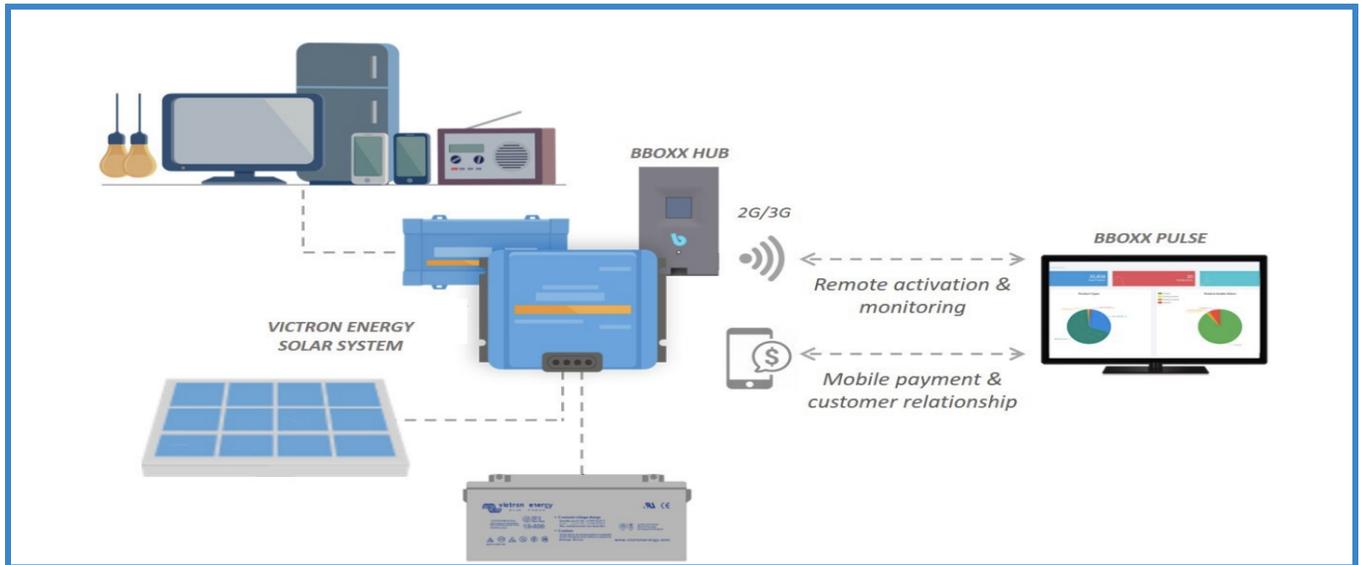
Solar Products Provider

Lack of electricity was identified as a critical barrier to mobile phone usage. Working with solar companies offering affordable solutions to solar home kits will encourage energy access in the home and increase mobile phone usage. The team had a meeting with Darna, a company that has partnered with Bboxx² and Bloom³ to offer affordable solar solutions. The IFAD team can compare Darna's pricing packages with those of other organisations providing the same solution, to ensure value for money for the farmer.

² <https://www.bboxx.com/>

³ <https://withbloom.com/>

Figure 5: Solar System Architecture, Darna Solar Solutions Example



Telecommunication Companies (Sudani and Zain)

Telecommunication companies have technical capacity and strategic partnerships with the government to expand mobile connectivity and reach in Sudan. A meeting with Sudani identified potential collaboration opportunities between the IFAD team and Sudani. As a starting point, the IAMPD team should send a list of the prioritised geographical locations with mobile connectivity challenges within the project regions to Sudani. This will enable Sudani to provide feedback on areas they can support with improving connectivity and any recommendations for joint interventions with IFAD. It is recommended that the team has additional meetings with Zain to explore similar opportunities for mobile connectivity expansion.

Other Considerations

Digitise Data Collection for Informed Market Access

Up-to-date retail pricing information is generally time-consuming to collect because it requires frequent engagement with market players. Community focal points can collect retail price information to inform farmers on current market prices for their produce. Open-source tools such as the KoboToolbox⁴ can be used by the focal points to make it easier to collect, analyse, and send the data to farmers.

⁴ <https://www.kobotoolbox.org/>

Streamline Digital Centre Information with Microfinance Institutions

The IAMDP programme team confirmed that the MFI partners reach out to farmers directly through their own communication platforms. To reduce duplication of efforts, the study recommends working with MFIs to identify opportunities to share the benefits and costs of the digital centre infrastructure.

Youth Mainstreaming

Further, youth have more proficiency in digital tools and skills and are prolific consumers of technology. The study showed that there were limited cultural restrictions to women and youth on the access of smart mobile phones within the households. Families were more willing to share mobile phones. Access to smart mobile phones was higher among the youths who could access WhatsApp and digital content.

Sustainability

Recruitment and Training of Community Focal Points

Community focal points should be trained on basic crop protection practices through a training-of-trainer (ToT) model to ensure support closer to the communities and complement the digital call centre communications. Programme extension officers may provide training for community focal points who, in turn, can train more farmers through publicly available materials. The DAS team is currently designing a virtual ToT course for the induction training of extension workers in Malawi. This ToT course will be accessed through a digital platform and is targeted toward ministry/district-level officials. The DAS team could potentially adapt this training towards the training needs of the community focal points and project extension workers.

Scaling and Commercialisation

Using digital tools to scale the reach of the call centres to all target states will increase the impact of the information service and reduce the per-unit cost of reaching farmers. Smart digital systems are useful in targeting farmers in specific value chains and geographical areas. Further, building linkages between private businesses and the call centre for information sharing and product promotion at a fee will encourage the sustainability of the call centres.

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