



CASE STUDY

NIGERIA



The GSMA Innovation Fund grant for Crop2Cash has helped smallholder farmers in Nigeria adapt to climate stressors and adopt climate-smart agricultural practices by unlocking advisory and financial services.

Country: Nigeria

Sector: Agriculture

Business model: B2C, B2B

Resilience capacity: Climate adaptation, climate risk absorption

Digital channels: Marketplace, USSD, AI and IVR advisory services

Problem addressed: Providing farmers in Nigeria with access to agricultural advisory and financial services

Stakeholders: Smallholder farmers

Find out more: crop2cash.com.ng

Cultivating Climate Resilience for Farmers through Digital Technology

The GSMA Innovation Fund for Climate Resilience and Adaptation

CROP2CASH PROJECT OUTCOMES NOVEMBER 2022 - JULY 2024



313.7k people reached



68,4k farmers supported to adapt to and absorb climate shocks



1,394 farmers accessing loans and insurance



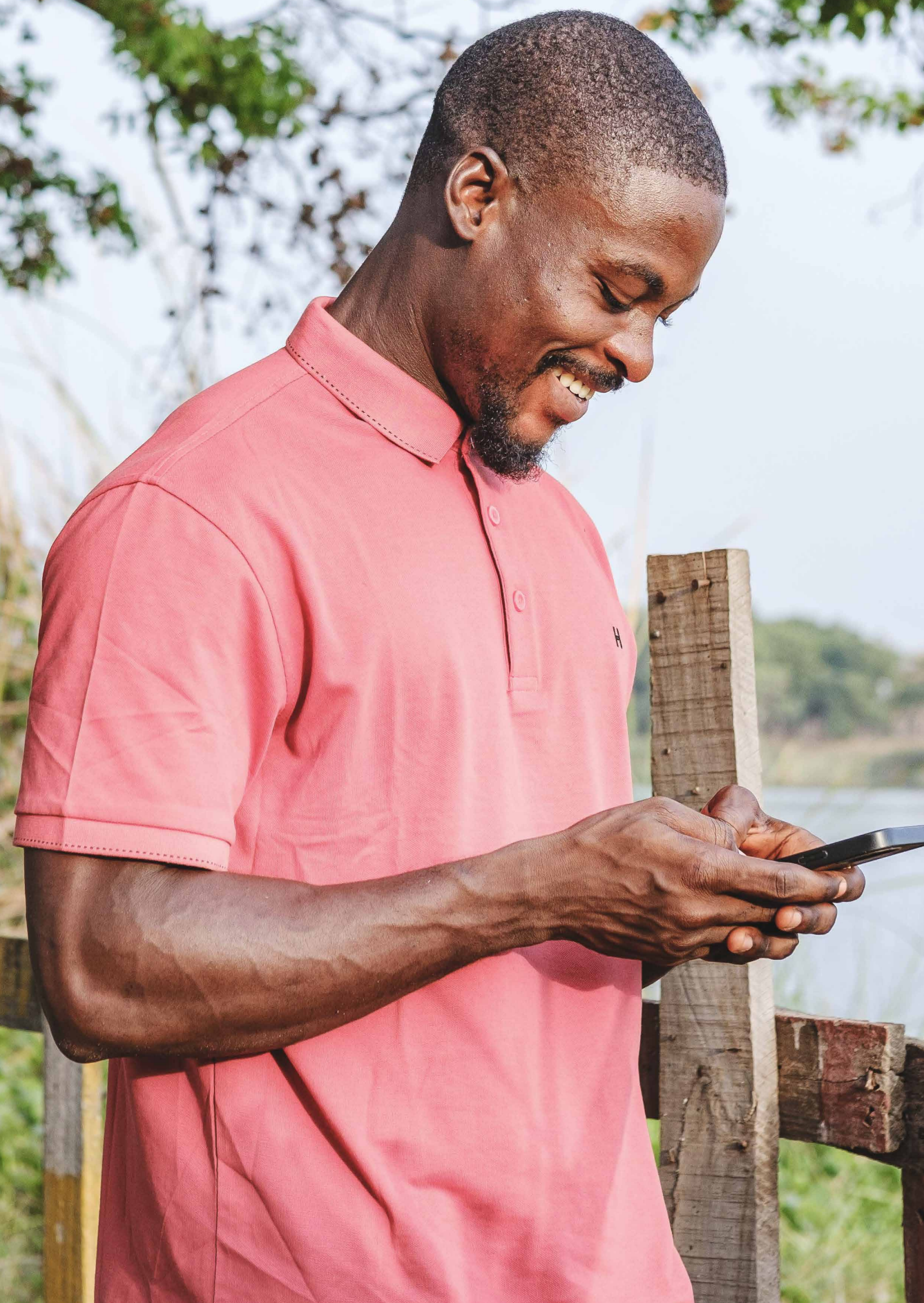
\$541k in loans disbursed (USD)



97% of farmers using Crop2Cash say it improves their access to information on harvesting practices

About Crop2Cash

Crop2Cash supports farmers in northern Nigeria impacted by drought and other challenges caused by climate change. The solution enables them to adapt and build resilience through climate-smart agricultural advisory, financing and agricultural inputs. The mission of Crop2Cash is to bridge the gap between smallholder farmers and financial institutions by providing access to digital financial services. By helping farmers build their financial identity, Crop2Cash contributes to the economic empowerment of rural communities in northern Nigeria, enabling them to become more resilient to the effects of climate change. To date, **Crop2Cash** has reached more than 500,000 smallholder farmers and unlocked \$2.8 million in credit, with farmers reporting a 70% increase in income.



Introduction

Impacts of climate change on farmers in Nigeria

Nigeria has experienced frequent and extended periods of drought and high temperatures caused by climate change. This is having a negative impact on food production. Northern Nigeria is particularly affected as most of the region suffers from periods of severe drought. This is also where about 80% of the country’s maize production is concentrated – an important crop for food security¹ as it accounts for more than 50% of the country’s total grain consumption and about 30% of daily caloric intake.² Northern Nigeria is also home to a large proportion of the country’s population living in poverty, and farmers are highly vulnerable as they often lack access to data and information on how to adapt and build resilience to these risks. According to the Poultry Association of Nigeria, in 2023, maize prices in Nigeria reached a record high, with the average price per tonne exceeding N 480,000. This represents a more than 100% increase from the previous year, with many experts pointing to extreme weather events, high input costs and pests and diseases affecting maize crops.³

In response to the extreme weather events in Nigeria in recent years, the government has taken proactive measures. Regional initiatives include the Great Green Wall, an effort to restore 100 million hectares of land by 2030 across the Sahel, and domestic initiatives include early warning information on extreme weather events from the Nigerian Meteorological Agency and AWARE, an early warning and action platform for flood resilience.

About the GSMA Innovation Fund project

Crop2Cash is one of the startups supported by the GSMA Innovation Fund for Climate Resilience and Adaptation. This initiative is funded by the UK Foreign, Commonwealth & Development Office (FCDO), the Swedish International Development Cooperation Agency (Sida) and is supported by the GSMA and its members.

The project spanned 20 months from November 2022 to July 2024. With the support of the GSMA Innovation Fund, Crop2Cash:

- Provided tailored SMS weather information and advisory on best agricultural practices to smallholder farmers
- Provided access to input financing and weather-based insurance via USSD
- Connected farmers to high-yielding drought-resistant seeds via USSD
- Launched an AI-powered interactive voice response (IVR) agricultural advisory service



We are making Nigeria’s smallholder farmers financially inclusive. The GSMA Innovation Fund has enabled us to scale our business model and unlock additional benefits through technical assistance and networking opportunities.

Michael Ogundare, Founder and CEO, Crop2Cash



1. Aliyu, K.T., Shehu, B.M. and Adam, A.M. (2024). “Digital technology in maize nutrient management research in northern Nigeria amid COVID-19 pandemic”. *Scientific Reports*, 14.
2. Agri-Street. (31 October 2023). “Maize Price Fluctuations: A Threat to Food Security in Nigeria”. *Medium*.
3. Ibid.

How does the solution work?

There are two main parts to the solution:

- 1 Access to financial services and a digital marketplace**
Crop2Cash connects smallholder farmers to financial services, strengthening their resilience to climate change and providing access to agricultural inputs. Farmers can access loans and agricultural insurance through the Crop2Cash platform, helping them improve their incomes and savings. Throughout the grant period, loans and insurance were provided to nearly 1,400 farmers, with more than \$540,000 in loans disbursed. In total, Crop2Cash has reached more than 500,000 farmers since 2018, unlocking \$2.8 million in credit.⁴

- 2 Weather information and agricultural advisory**
Through the Crop2Cash digital platform, farmers can access weather information and agricultural advisory. The advisory service is offered through in-person training, from an extension agent or through SMS. During the grant period, Crop2Cash processed 50 to 70 SMS advisories per farmer on average, depending on the season.

AI-powered agricultural advisory service
In July 2024, Crop2Cash launched the National Hotline for Agriculture – an AI-powered agricultural advisory service. The use of AI allows the IVR system to communicate in multiple languages, making it accessible to smallholder farmers who are more fluent in languages other than English. The solution launched in three languages – Yoruba, Hausa and English – and another two languages have since been added. Through the hotline, farmers can access real-time, personalised agricultural advice that helps them operate more efficiently. To date, more than 12,000 farmers have accessed the platform. With each call to the hotline averaging 18 minutes, there is high customer engagement with the service.

4. Owojori, W. (29 August 2024). “Ensuring food security by solving the agricultural information gap”. *GSMA Mobile for Development Blog*.

Figure 1
Crop2Cash user journey

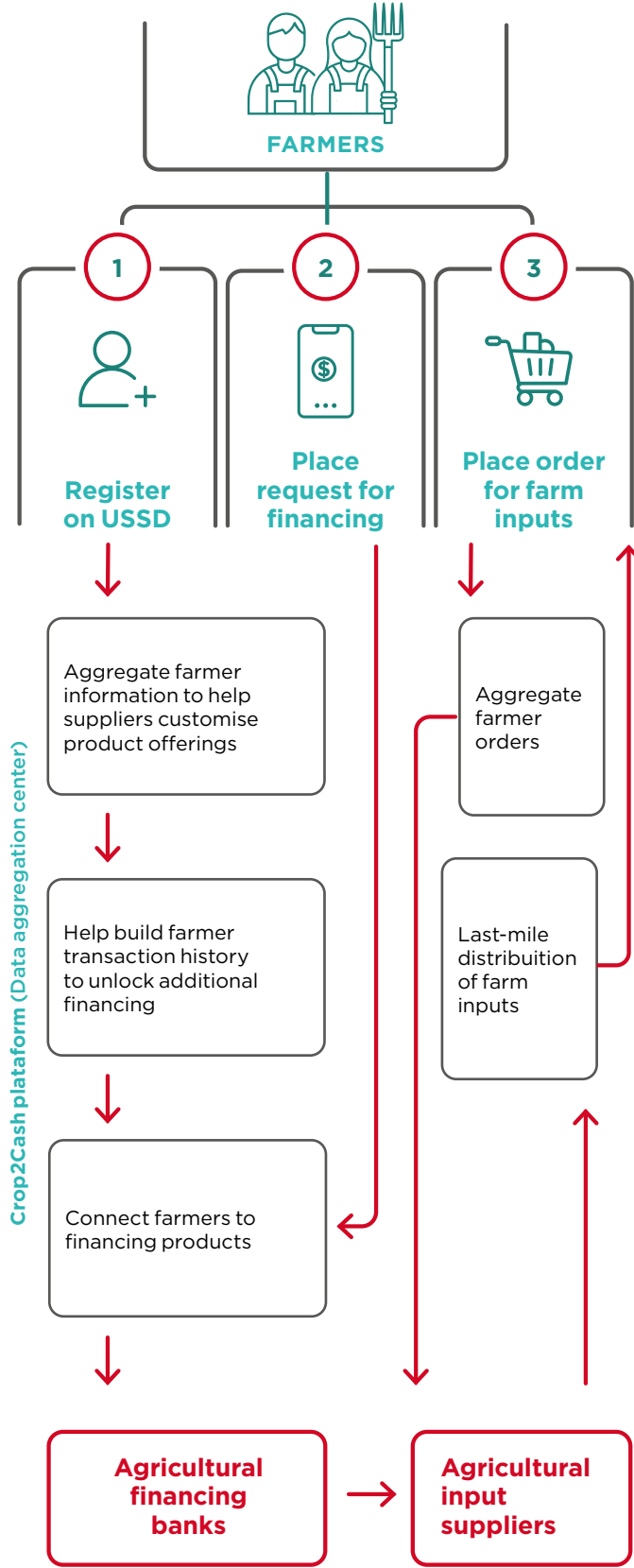


Figure 2
How the AI-powered advisory service works

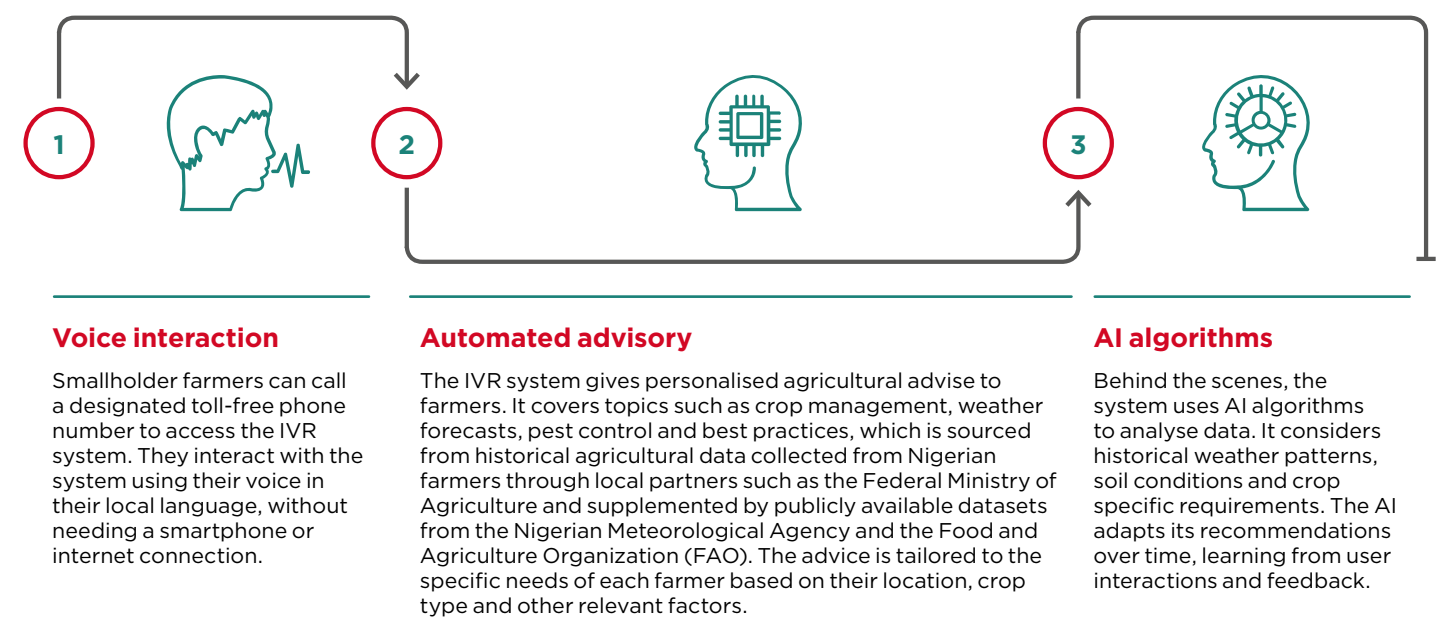
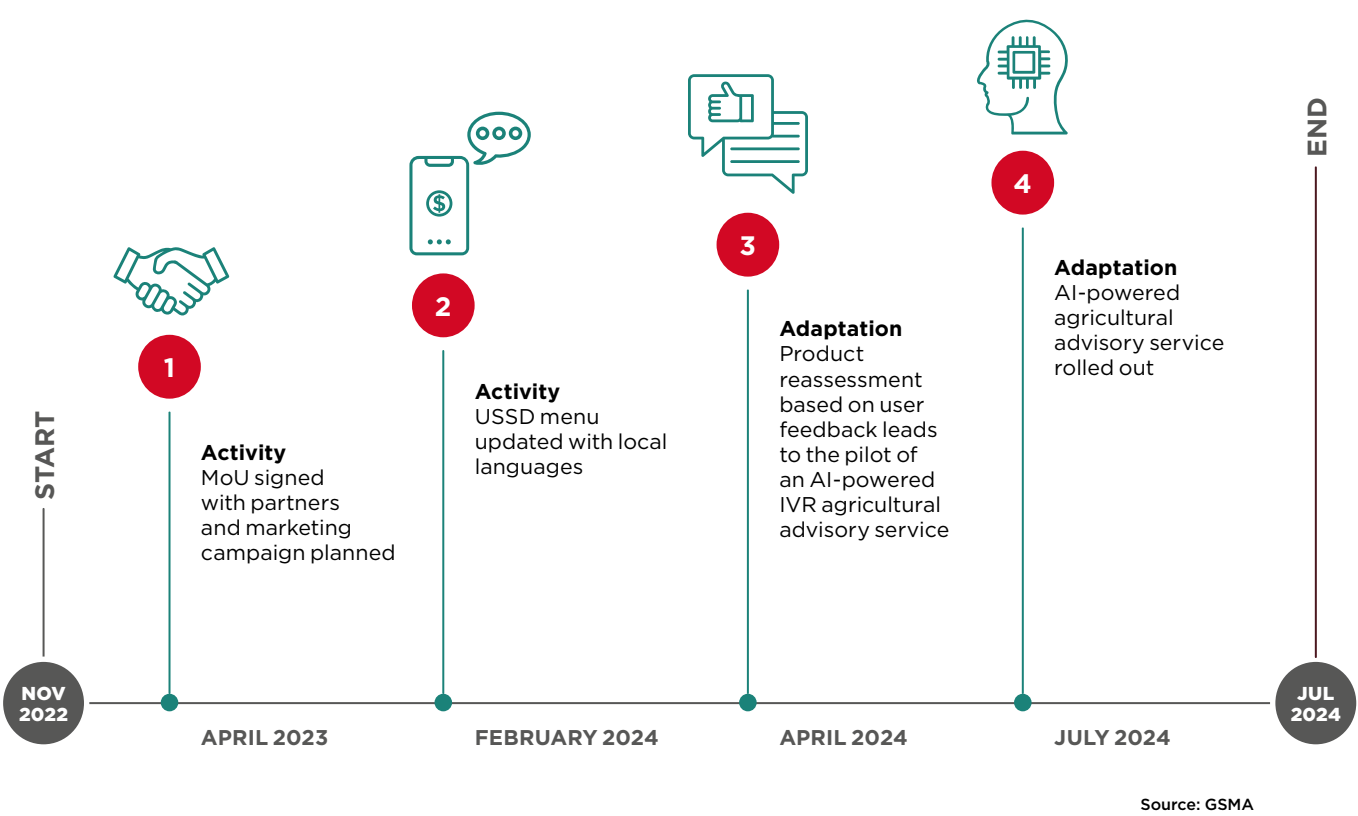


Figure 3
User interface of Crop2Cash app



Key project activities

Figure 4
Key milestones of the Crop2Cash project



Implementation strategy

The focus of the grant project was to onboard more users and unlock credit, which would enable farmers to access financial services. This was to be accomplished through the development of a user-friendly USSD solution and securing partnerships.

Due to some underspending in the grant because of the devaluation of the naira, Crop2Cash had room to reevaluate the project and introduce a new feature. Solutions like Crop2Cash depend

on extension agents to provide information and enable users to access services. Ideally, one extension agent should be responsible for 10 to 50 farmers. However, in Nigeria, the ratio is more likely to be one agent to 10,000 farmers. Crop2Cash saw this as challenge that could be solved with the help of digital technology. In October 2023, the team started planning an IVR service, powered by AI, to provide agricultural information and advice in local languages. The pilot solution was launched 10 months later as the National Hotline for Agriculture.

Partnerships

During the grant period, Crop2Cash embarked on several partnerships that enabled them to expand their offering.

To help farmers adapt to climate change, Crop2Cash entered partnerships with agricultural input and financial services providers. Notably, they entered a partnership with seed company Seed Co to offer farmers access to drought-resistant seeds through their platform. Seed Co provided an improved variety of seeds and agronomy services to help farmers improve their yields.

Crop2Cash also partnered with First City Monument Bank (FCMB) to provide farmers with access to financial services during the grant period. By leveraging their services and APIs, Crop2Cash was able to integrate farmers' information to create account details and ensure credit checks were carried out before financial services were offered. Crop2Cash also collaborated with Royal Exchange General Insurance to provide premium insurance for financed farmers.



Building climate resilience

Overall impact

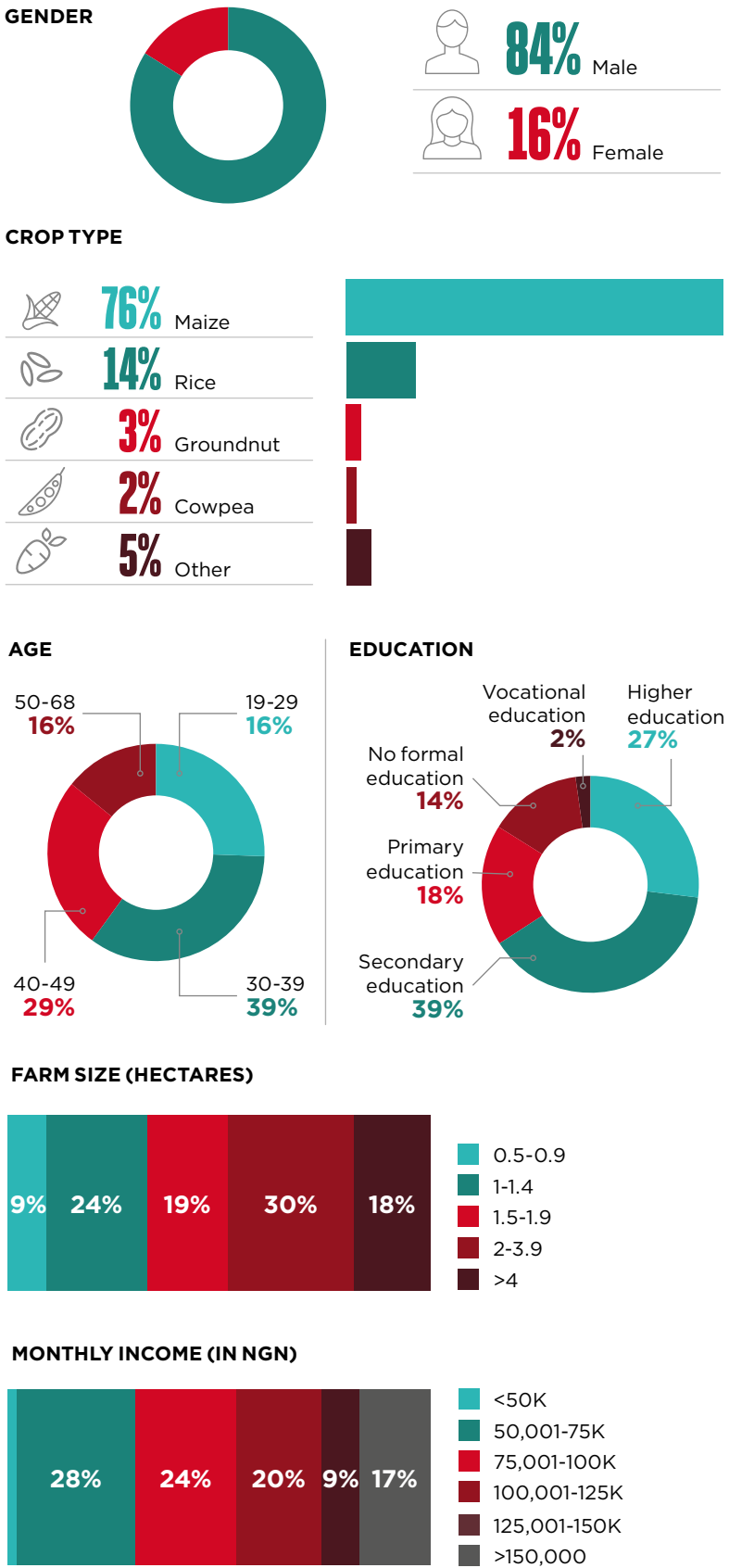
Crop2Cash has supported Nigeria's farming communities to build resilience to the effects of climate change. By providing climate-smart agricultural inputs, agricultural advisory and financial services in local languages, they are building the capacity and knowledge of farmers, strengthening their ability to adapt to changing weather patterns and adjust their activities to new conditions. Interviews with the Crop2Cash operations team and a sample of users revealed the following achievements during the grant period:

- **313,735 people** reached
- **68,491 farmers supported** to adapt and build resilience to climate change shocks
- **1,394 farmers** accessed loans and insurance
- **US \$541,558** in loans disbursed

Crop2Cash user profile

The average Crop2Cash user is a 39-year-old male farmer with secondary education, managing a two- to four-hectare farm in Kaduna state where he cultivates maize, with a personal income of less than NGN 125,000 (USD \$82) per month. Figure 5 provides an overview of the profile of users we engaged with for our research.

Figure 5
Crop2Cash user statistics



*Farmers in Nigeria typically make between 55-165k NGN

The vast majority of farmers report that weather patterns are changing and they are taking steps to adapt

According to GSMA research, 83% of Crop2Cash users report that weather patterns are changing. 58% of these users say this has had an impact on their daily lives, with some reporting health challenges such as coughs and fevers due to excessive heat. Although many of the surveyed users reported doing nothing specific to adapt to climate change, 35% have changed their planting and harvesting calendar and 33% have changed the crops they grow.

Outcome 1: Crop2Cash helps farmers access agricultural inputs through input financing

70% of the surveyed farmers use Crop2Cash to finance inputs such as fertilisers, agricultural chemicals and seeds. The vast majority believe that Crop2Cash's input financing services enables them to access agricultural inputs quicker, and more than 90% believe they are available at a decent price.

The vast majority also believe that Crop2Cash input financing helps them to maintain their farming operation and enhances their ability to recover from climate events.



“

The input financing has helped me adjust to changes in climate and weather patterns while maintaining my farming activities because I get the inputs that help me with maintenance, planting and ensuring the soil is rich up to harvesting.

Male farmer, 55 years

”

Lesson 1

Lack of awareness can lead to features not being used

The main barrier to farmers using input financing is lack of awareness of the feature or how to request it. Additionally, 99% of users go through an extension agent, indicating the need for in-person engagement and the possibility of simplifying the process. A third of users are also unaware they have a mobile money account, even though all users have access to their Wema mobile wallet. More work is needed to raise awareness and build the digital and financial skills of users.

Figure 6

Access to input financing

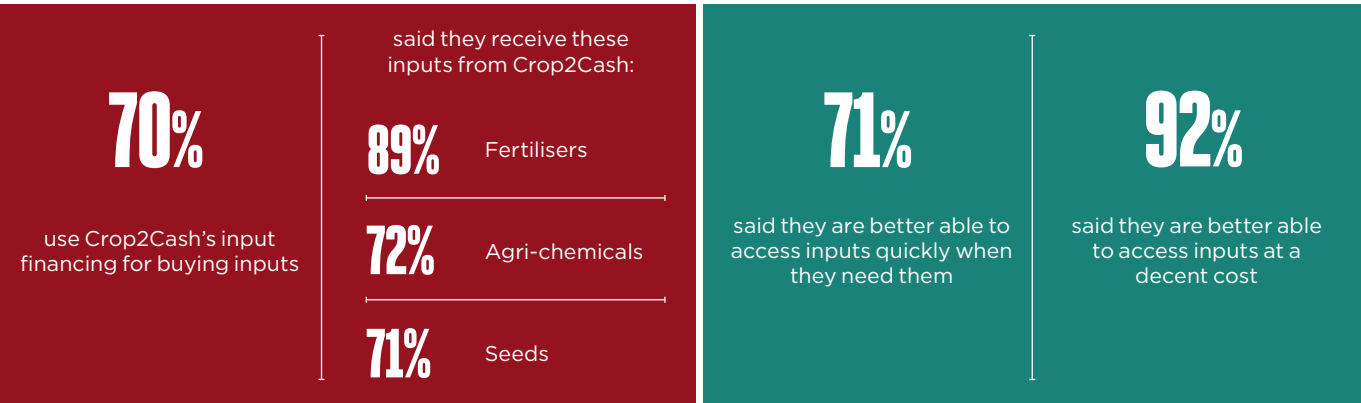


IS THE SERVICE BEING USED?



IS THE SERVICE BRINGING CHANGE?

Out of the 70% of Crop2Cash users who use the service:



Lesson 2

Even though weather insurance has not been used, it offers farmers peace of mind

Only 7% of input financing users were aware that the feature offers weather insurance. At the time of the survey, none of the farmers had received a payout. However, of the ones who were aware, the majority stated they were satisfied with the feature and some stated they would never take separate weather insurance if it was not bundled with the input financing. In fact, 75% stated that the insurance reduces their stress related to a climate event.



“

If bad things befall on us, it guarantees a recovery and I know it is not the end for me. This insurance has helped with my peace of mind truly, even though I prepare against any misfortunes.

Male farmer, 35 years

”

Lesson 3

Digital tools are an entry point to financial inclusion

Even though users see the potential benefits of a digital marketplace, many still prefer traditional markets. Gaining access to digital tools should not be seen as a silver bullet, but rather a step in a journey that leads to more sophisticated use over time. Some of the barriers reported by users were not knowing how to access the marketplace and not being “tech savvy” enough. More work could be done to improve the digital and financial skills of target users, and to simplify the marketplace so that using it is not overwhelming to those with less digital experience.

“

I know how to use USSD, but agents seem more convenient to use. For example, if there is no light and my phone has no charge, we can use another person's phone and request that an agent helps.

Male farmer, 25 years

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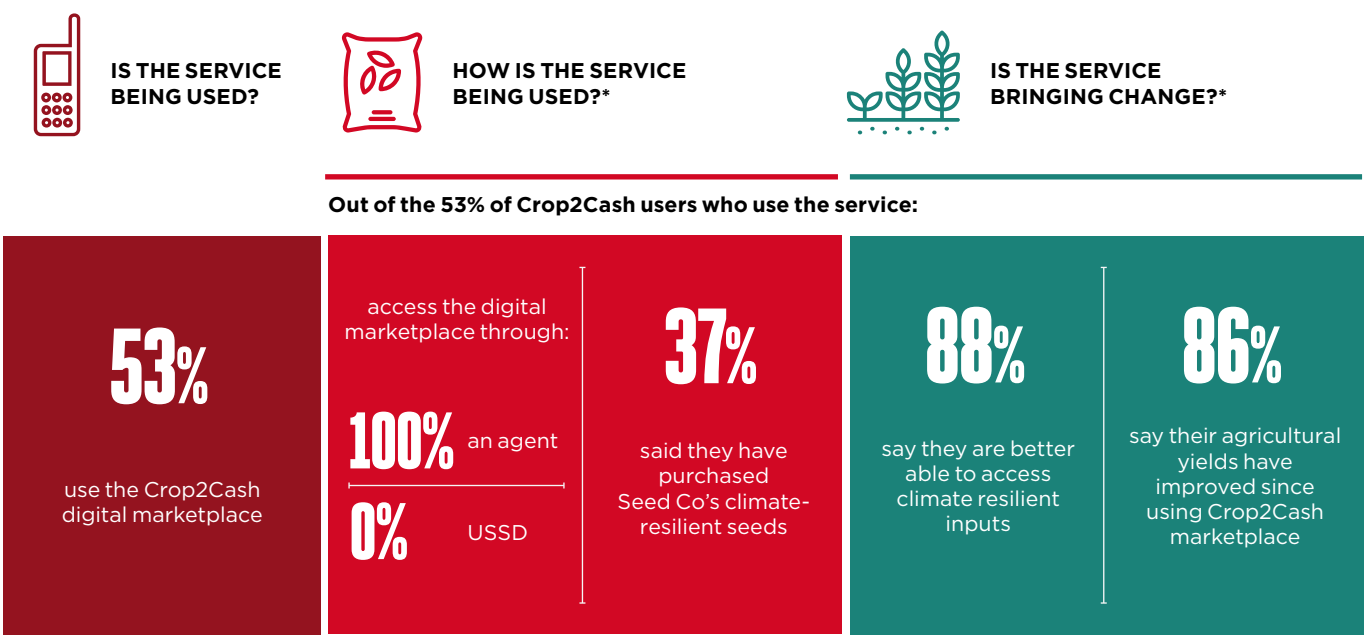
Outcome 2: Crop2Cash helps farmers access agricultural inputs through input financing

More than 90% of users reported that the Crop2Cash digital marketplace helps improve their crop yields and overall income. They also stated they have better access to climate-resilient agricultural inputs such as drought-resistant seeds, and they are more convenient than they would be without Crop2Cash. However, most continue to purchase their inputs at local markets and the Crop2Cash digital marketplace is seen as a complementary solution to more traditional channels.



Figure 7

Access to digital marketplace



Outcome 3: Crop2Cash improves farmers' knowledge and helps them change practices

About 93% of smallholder farmers in Nigeria face challenges accessing reliable agricultural information.⁵ Crop2Cash's weather information and agricultural advice features have a high level of satisfaction among users, who report they have helped them to change their farming practices and adapt to changing weather conditions. Advisory users reported they have learned new things and all of the farmers interviewed implemented some or all of the advice provided by Crop2Cash. Most also reported improved agricultural yields and income since they started using the advisory and weather information services provided.



The advice seems to come at times when it is relevant, whether for raining season farming, for treating pests for harvesting and the likes, so it is timely, it is good. I learn about measures to take in order to survive through different seasons of farming, also how to manage the inputs.

Male farmer, 51 years

Lesson 4 Users struggle with the complexity of the advice

Despite a high level of satisfaction among users, most reported that the information provided is too complex. There is an opportunity for the AI agricultural advisory service to help make sense of more complex information, as it offers the chance to ask follow-up questions and break answers into smaller steps.

Outcome 4: AI makes it easier to get agricultural information

Crop2Cash's AI-powered agricultural advisory service, which was in the pilot stage,⁶ had some initial limitations. Some farmers reported it was unable to answer some of their crop-specific questions or provide information on financial and farm management decisions.

However, users also recognised that the solution can play an important role in educating farmers and helping them adopt more effective farming practices, especially since it is available any time of day. They also expressed that it could simplify farming activities and make it easier to manage their daily operations.



Before, when I had a problem, I had to call an agent and wait to get an answer. Today, I can reach customer service and resolve my issues fast, this is just easier.

Male farmer, 35 years



Lesson 5 Although some farmers are quick to adopt new technology, it is important to build trust, particularly among older farmers

At the time of the survey, some of the older farmers expressed they are more comfortable with traditional in-person communication. It was also mentioned that the AI bot is perceived as a white person and, therefore, an outsider in the community. However, feedback received by Crop2Cash since the launch of the pilot indicates that community members who are less familiar with digital technology appreciate using the IVR feature as it feels like they are speaking to a real person rather than communicating with a device. Building trust and familiarity with new technology will be instrumental for this feature to be successful, and the AI feature shows promise for humanising the service and including people in the community who otherwise would not use digital technology.



5. Babban Gona. (n.d.). "Uncommon Facts about Smallholder Farmers in Nigeria".
6. It is important to note that, at the time of the survey, the AI agricultural advisory service had only been available for about a week and most farmers had only been using it for a very limited amount of time before answering these questions.

What's next for Crop2Cash?

Strengthening commercial viability

During the grant period, the AI agricultural advisory service was developed and launched as a pilot version. It has since been improved and two more languages added, with more languages in the pipeline. The lack of extension agents to provide information to farmers is an issue faced by farmers not only in Nigeria, but also in other parts of Africa and the world. An AI service therefore has the potential to close this gap and scale significantly in Nigeria and other markets. The first of its kind in Nigeria, the AI agricultural advisory service has added significant value to Crop2Cash's solution, making them stand out among similar solutions in the region.

Crop2Cash is continuing to work with strategic partners to unlock ways for farmers to access financial services and climate-resilient inputs. They could also benefit from partnerships with mobile network operators (MNOs) to reach more farmers and enable them to access Crop2Cash solutions through the MNO's mobile money service.

Looking ahead

During the grant period, Crop2Cash managed to secure additional funding from several investors, including \$350,000 from Village Capital to help them grow and scale their impact.

Crop2Cash has now expanded beyond Nigeria and is also operating in Kenya with the aim to enter additional markets in the future. Over the next 5 years, Crop2Cash aims to expand their AI advisory service to countries in East and West Africa, with the ambition to reach 3.5 million smallholder farmers. They also plan to further expand their marketplace through securing additional partnerships to enable farmers to get access to \$200 million worth of inputs annually.





Conclusion

With the support of the GSMA Innovation Fund for Climate Resilience and Adaptation, Crop2Cash has contributed to building the resilience of smallholder farmers facing climate- and drought-related challenges in Nigeria.

Crop2Cash has demonstrated that even though many smallholder farmers still prefer human interaction and more traditional ways of receiving

information and advice, digital technology has the potential to bridge the gap if users feel they are interacting with a real person. The AI agricultural advisory service, in combination with providing farmers with access to financial services and climate-resilient agricultural inputs, could pave the way for a more sustainable future for agriculture and the lives of smallholder farmers in Africa.

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