



Can digital services help tackle the extension service dilemma?

Evidence and lessons on improving farmer practices at scale from the ILO's An Ka Baara project in Mali

Meet Manfa, a 42-year-old farmer, who produces chili peppers in southern Mali on a small 0.1-hectare plot close to the border with Guinea, where much of his produce is exported. Manfa is an experienced farmer, having grown vegetables for more than 20 years. Yet, despite his experience, he faces major challenges with his chili pepper crops. Last season, he lost about 70 per cent of his seedlings to crickets and other pests.

This season, however, things changed. It all started when he received a promotional robocall on his phone. The call shared advice on how to fertilize vegetable plots and invited farmers to access additional advice, on demand and free of charge, through the “Kunafoniw” 3-2-1 service (see box 1). To learn more, Manfa dialled 37321 to access the service. There, he found several messages on chili pepper production, including advice on preparing a nursery and caring for seedlings. He learned, for example, that seedling beds could be covered with mosquito netting, secured to the ground, to protect them from pests. After applying this technique, along with others he had discovered, Manfa reduced his seedling losses to less than 10 per cent. Overall, he also reported increasing his yields by around 50 per cent, a result that he attributes largely to the advice received through the service.



Manfa Kané, a chilli peppers producer in southern Mali. *Photo credit: IDEAL CONCEPT – IDC Media.*

► Box 1: Viamo and its Interactive Voice Response System “Kunafoniw”

“Kunafoniw” is an Interactive Voice Response (IVR) service operated by Viamo in Mali, in partnership with the mobile network operator Orange Mali. It allows any Orange Mali sim card holder to access pre-recorded voice messages on a variety of topics (including health, news and agriculture) using basic mobile phones, without requiring internet access. This makes it particularly well-suited to rural areas with limited connectivity and users with low literacy levels.

In practice, users navigate the system using their phone’s numeric keypad. After dialling the service number, they hear a voice prompt guiding them through a series of options – for example: selecting a language, then a topic, then a sub-topic, then a specific message. Each step corresponds to pressing a number (e.g. “Press 1 for Bambara, Press 2 for Fula”, etc.; “Press 1 for agriculture, Press 2 for health”,

etc.), allowing users to independently access the information most relevant to them. Once a message is selected, the audio recording is played. Users can listen, replay and navigate to other messages as needed.

Across Mali, thousands of farmers like Manfa listened to IVR messages on farming best practices developed by the ILO's An Ka Baara project, and many reported putting what they learned into practice (see box 2). This case study examines the central question: Can a basic phone service provide practical technical advice that farmers can use? This brief unpacks the ILO's work to answer this question through details on the intervention's context, design, reach, reported results and lessons.

► **Box 2: ILO An Ka Baara's Viamo intervention results at a glance**

► **New messages made available on the platform**

- 199 pre-recorded short messages and 13 dramatized audio episodes made available
- Available in five languages, on demand and free of charge, to Orange Mali subscribers
- Advice covering 10 vegetable crops, mangoes and farm business management

► **Reach of the new messages between January 2025 and June 2026**

- 380,000 unique listeners (out of 440,000 callers that "accessed" the messages)¹
- 3.35 million messages listened to (out of 4 million messages "accessed")
- More than 6.6 million minutes of listening time (equivalent to 110,000 hours or 12.6 years)
- An average of 8.8 messages per unique listener, and more than 17 minutes of listening time

► **Individual survey results**

- 244 "highly engaged" farmer listeners (having listened to 4+ messages) surveyed
- Almost all (98 per cent) recalled at least one piece of advice received
- More than three quarters reported implementing advice received
- About two thirds reported the advice contributed to income increases
- Roughly half reported income increases of more than 10 per cent and two in five reported increases of at least 25 per cent.

The intervention

What is the context?

Agriculture is the backbone of the Malian economy. However, productivity remains extremely low, leaving many households trapped in poverty. Rapid population growth compounds this challenge: more than 200,000 young people enter the labour market every year with few employment prospects.² For many, the choices are: stay on the family farm or seek opportunities elsewhere, such as in cities like Bamako to work

¹ A message is considered "listened" to once at least 75 per cent of its content has been listened to. If a listener does not reach that threshold, the message the listener was listening to is only considered to be "accessed" (not "listened"). Moreover, a "caller" becomes a "listener" only once they have listened to at least 75 per cent of at least one message. If a caller does not reach that listening threshold, they are not considered an active listener.

² [Creating Markets in Mali: Country Private Sector Diagnostic \(ifc.org\)](https://www.ifc.org/publications/creating-markets-in-mali-country-private-sector-diagnostic)

in the informal sector, in artisanal gold mines where dangerous and exploitative conditions are widespread³ or even as recruits in armed groups⁴.

Against this backdrop, vegetable farming has emerged as one of the country's most promising livelihood opportunities, particularly for women and youth. Unlike the country's dominant agricultural activities – cotton, livestock and cereals – vegetables can be grown on small plots with limited mechanization and modest upfront investment, while generating quicker and higher returns. Fuelled by growing urban and regional demand, the area devoted to small-scale vegetable production has expanded more than ten-fold in recent decades.⁵

At the same, the sector is knowledge-intensive and often unforgiving: mistakes in seed selection, nursery management, irrigation or pest control can quickly translate into crop failure or lost income, even for experienced farmers. The problem is simple: most vegetable farmers have never received formal training. Agricultural education in Mali has historically focused on livestock and cereals, public extension services are underfunded, input providers are concentrated around urban centres, and private advisory services are virtually non-existent as vegetable producers cannot afford them.

What was the ILO's intervention?

Recognizing that conventional extension services were unlikely to meet the scale of demand, the ILO's An Ka Baara project, funded by the Swedish International Development Cooperation Agency (Sida) and the Italian Agency for Development Cooperation (AICS), turned to digital advisory services.

To address this, the project chose to work through Kunafoniw 3-2-1, an existing service operated by Viamo in partnership with the mobile network operator Orange Mali. This allowed the project to use established telecommunications infrastructure and an existing national delivery channel rather than creating a new project-owned platform whose operation would depend entirely on continued project financing.

The project initiated, financed and steered the intervention. It defined priority topics, and oversaw the development of 199 advisory messages: 139 on ten vegetable crops, 39 on mango production and 21 on farm business management. Agronomic and communication specialists supported the drafting and strengthening of the messages, with technical input and validation from the National Directorate of Agriculture before they were translated and recorded in Bambara, Songhai, Tamasheq, Fula and French.

Viamo supported adaptation and production for the IVR format, integration into Kunafoniw, platform promotion and provision of usage data. Orange Mali provided the telecommunications channel through which subscribers accessed the service. Once online, the project funded its promotion through several channels: a Viamo robocall (the one Manfa received), rural radio advertisements, promotion at a mango festival, and training of extension officers from the National Directorate of Agriculture so they could promote the service in their own advisory work.

► Box 3: An example of a message on watering (translated from French)

Did you know that proper watering can improve the quality of your produce? Here are some simple tips to follow:

- Adjust your watering frequency based on your soil type. The more clay your soil contains, the better it retains moisture. Clay soils can sometimes hold water for two to three days. In contrast, sandy soils generally need to be watered at least once a day, even in the cool season, as they dry out very quickly.

³ According to [ILO estimates](#), between 400,000 and 1 million people are involved in the artisanal mining sector in Mali.

⁴ [Journey to extremism in Africa: Pathways to recruitment and disengagement | United Nations Development Programme](#)

⁵ <https://worldveg.tind.io/record/74195?ln=en>

- Gradually increase the amount of water as your plants grow. Water needs are highest during the flowering and fruiting stages.
- Adjust watering times depending on the season. During the cool and rainy season, water between 9 a.m. and 4 p.m., directing water to the roots to avoid wetting the leaves. This helps reduce the risk of diseases linked to nighttime moisture. During the hot dry season, to limit evaporation, water preferably between 7 a.m. and 9 a.m., and between 5 p.m. and 7 p.m.
- Follow good water management practices. Check soil moisture before watering by inserting your finger about 2 cm into the soil. Use mulch to reduce watering needs, especially in the hot season. Make sure to use good-quality water, as wastewater can harm your plants and affect the quality of your harvest.

► Box 4: The intervention set-up and incentives

An Ka Baara made a substantial upfront investment required to develop, validate, translate, record, integrate and promote the advisory content. Once the messages were incorporated into the platform, however, the cost of continuing to make them available is considerably lower than the original content-development and production investment, and farmers can access them for free.

The initial incentive for Viamo is a direct payment for its services. However, their long-term business model depends on having a reliable platform to reach large audiences by both development partners and Orange Mali. If content disappeared soon after a project ended, that value proposition would diminish. Moreover, high-quality content also makes the platform more attractive to users, which in turn strengthens Viamo's offer to future partners.

Orange Mali's incentives include differentiation of its subscriber offer, customer loyalty, perceived network value, visibility and institutional or corporate-responsibility benefits. This is important in a context where pre-paid customers can easily switch service providers.

The model also involves a trade-off. The service was available to Orange subscribers rather than across all mobile networks. While development programmes commonly seek network-neutral coverage, exclusivity may be part of what gives a mobile network operator sufficient commercial or reputational incentive to support "free" access.

Viamo has indicated that content generating demand would normally remain available, but longer-term continuity also depends on the durability of incentives, continued visibility of the service and the evolving involvement of relevant public institutions.

The reach

How many people accessed the service?

To determine the reach of the messages following their launch on the platform in December 2024, the project relied on aggregated Viamo data for the period of January 2025 to June 2026. Results are summarized in the table below.

People who listened	380,000 unique listeners, who listened to more than 75 per cent of the content of at least one message
Number of messages listened	3.35 million messages listened to
Time spent	6.6 million minutes of listening (equivalent to 110,000 hours or 12.6 years)

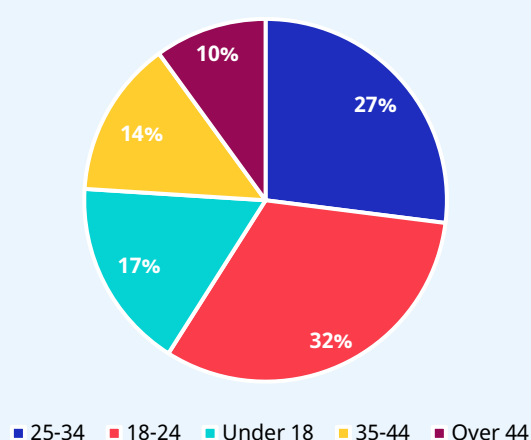
Average engagement per listener

8.8 messages per listener, equivalent to more than 17 minutes of listening time

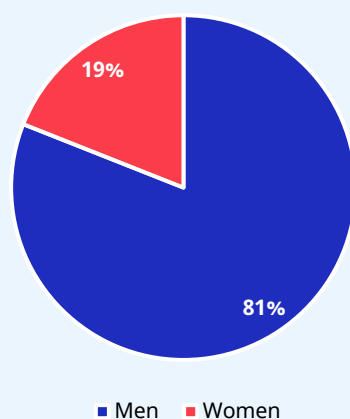
What do we know about the listeners' profile?

According to Viamo data, about 62 per cent of listeners provided information on their profile, summarized in the following charts.

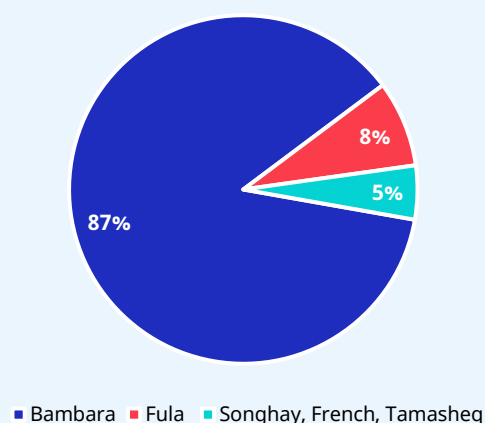
► How old were the listeners?



► What gender were the listeners?



► What language did they listen in?

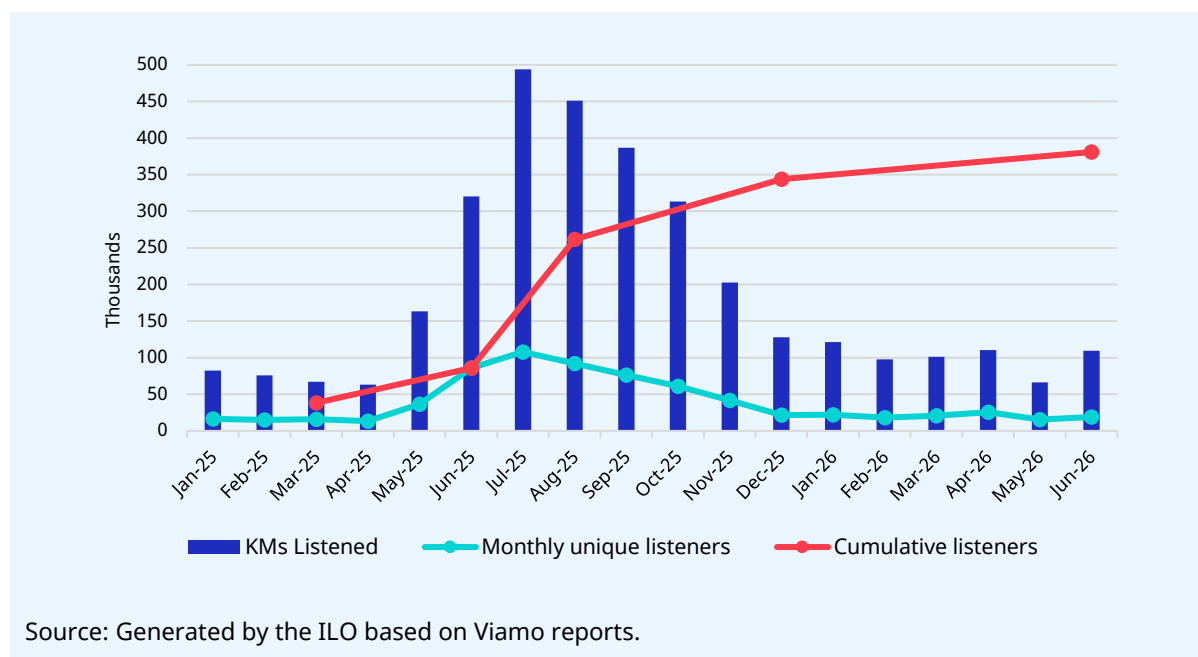


In summary, use was concentrated among relatively young users who listened in Bambara. Recorded participation by women was substantially lower than by men. It should be noted, however, that phones and SIM cards are routinely shared in West Africa while there is also a gender gap in terms of phone ownership. As such, the person whose profile is registered on the service may not always be the individual listening and women listeners may be widely underestimated.⁶

⁶ Maternal health messages developed a couple years prior and having achieved wide reach in Mali displayed a similar gender gap suggesting women listeners may be underestimated by platform data. For more information, see: [Digital health for mothers and newborns](#).

How did listening trends change over time?

As shown below⁷, the service uptake started relatively slow before peaking in July 2025 at more than 100,000 monthly unique listeners and close to 500,000 messages listened. From August, the service outreach declined back to around 20k unique monthly listeners and 100k messages per month.



Following inquiries about the large usage swings, it may be largely attributable to the removal and reinstatement of the minimum credit balance requirement of FCFA 100 (approx. USD 0.20) imposed on Orange Mali subscribers to access the service considering that similar swings were observed across other messages in Mali.

Are there any patterns in terms of listening behaviour?

More than two-thirds of listeners (268,000) listened to less than four messages. In other words, a large majority of users had limited repeat engagement after exposure to the messages. However, this also means that a minority had very high levels of engagement, pushing the overall average up to 8.8 messages per listener (see table below).

	All listeners (with >= 1 KM)	Listened < 4 messages	Listened >= 4 messages
Number / % of total	380,000 or 100%	268,000 or 70%	112,000 or 30%
Average KMs per listener	8.8	3 or less	22 or more ⁸

[Evaluating a mobile voice messaging awareness campaign in Mali, a descriptive observational study](#). Citation: Tounkara FK, Tégoué I, Touré O, et al. Digital health for mothers and newborns: Evaluating a mobile voice messaging awareness campaign in Mali, a descriptive observational study. Int J Gynecol Obstet. 2025;00:1-12. doi:10.1002/ijgo.70617

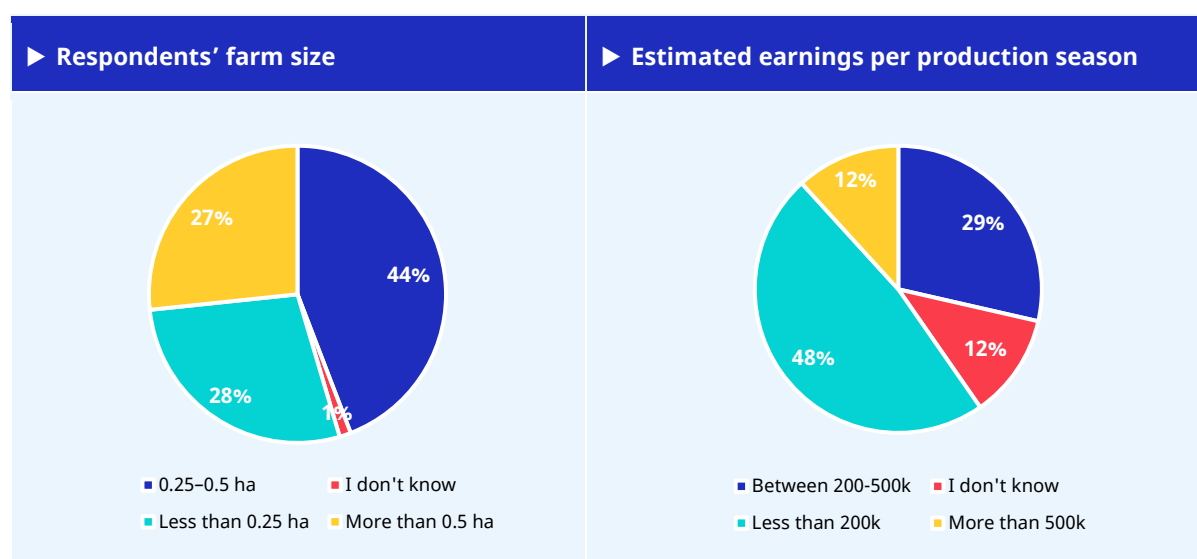
⁷ The cumulative listeners line is a projection, and should be viewed as indicative rather than definite. It is inferred based on the number of unique listeners mentioned in Viamo reports extracted at different points in time throughout the project period.

The impact

In an effort to better understand the impact of the message service and the intervention at large, the project conducted phone surveys to Viamo users. Here, the project surveyed 244 horticultural producers⁹, who had been identified by Viamo as being active in the project regions and having listened to four or more of the messages. As such, the survey deliberately focused on a more engaged segment of users rather than the listener population as a whole, as impact from more engaged users was considered more likely. Despite using intentional efforts to target female respondents, who represented less than 20 per cent of all listeners according to Viamo data, only 7 per cent of the respondent sample was female.

The project complemented the survey with a small number of field visits to document "success cases", including Manfa's story, during which interviewed farmers reiterated their survey responses. It did not independently verify reported changes in agricultural practices, yields or incomes. The reported outcomes, therefore, reflect farmers' own accounts rather than objectively measured impacts.

Characteristics of survey respondents

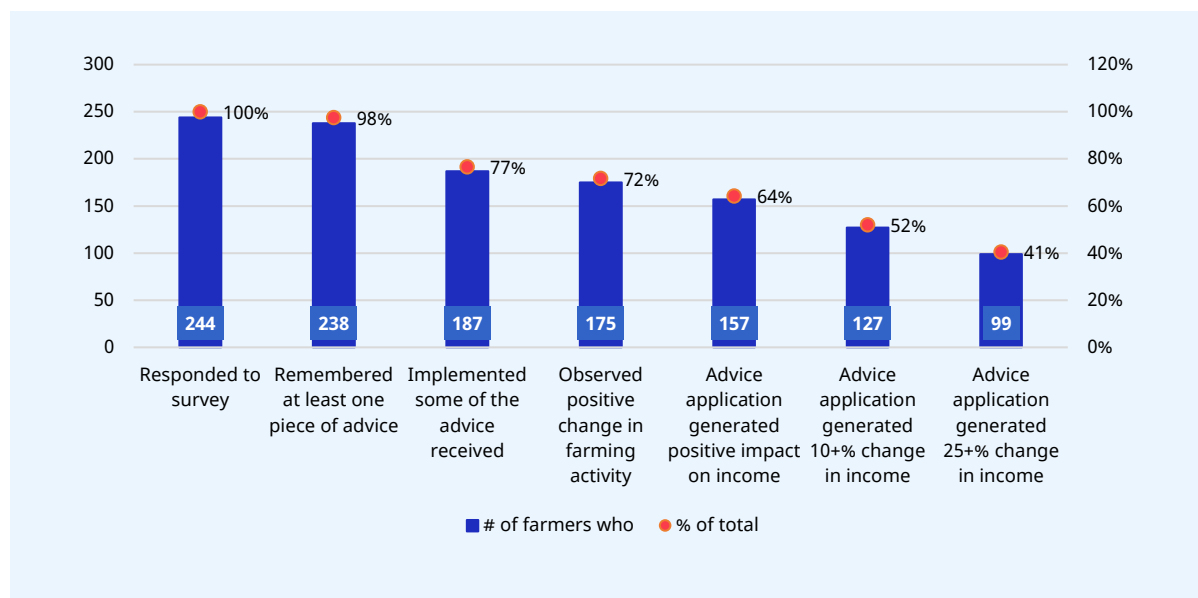


In line with the overall makeup of the vegetable sector, the farmers reached in the survey were mainly small-scale farmers with plots of less than 0.5 hectares and earning, on average, less than FCFA 500,000 per production season (equivalent to less than USD 1,000).

⁹ About 40 per cent of people called said they had either never heard of Viamo, never used the service, or were not horticultural producers. These figures may likely be explained by several factors including shared phone patterns (someone else than the respondent used the phone to listen to the messages), untruthful answers from respondents, and a portion of "just curious" listeners who genuinely were not horticultural producers but still listened to at least four messages.

Survey results

► Number of farmers surveyed



Advice recalled and applied

Across all farmers surveyed, almost all (98 per cent) recalled at least one piece of advice from the Viamo messages. More than three-quarters reported having applied at least some of that advice, while those who did not, commonly cited lack of time or resources as the main barriers. Among those who applied the advice, many reported previously relying on inherited practices, such as insufficient soil preparation, watering too much or at the wrong time, or applying inputs without measurement. The most frequently cited changes included improved bed-making, respect for recommended spacing, more controlled irrigation, greater use of organic fertilizer, improved pest management, and more careful harvesting and storage. Together, these responses suggest that the intervention promoted not only the adoption of relatively simple agronomic practices, but also a broader shift towards more deliberate and structured crop management.

Impact on production and incomes

Among farmers who reported positive change, more than 90 per cent declared the changes had to with production (higher yields and better product quality) while around a quarter also reported other improvements, notably reduced costs. Overall, more than half of all farmers surveyed reported achieving an income increase of at least 10 per cent while two in five reported income increases of at least 25 per cent.

Extrapolating the survey results to all listeners

Extrapolating survey results collected from 244 farmers to a population of 380,000 listeners is an inherently perilous exercise, in particular when sampling methods used are not entirely random¹⁰, and results are self-reported rather than independently verified. While these do present challenges, we have intended to make credible impact and outreach estimates, which are as follows:

¹⁰ The sample was notably focused on the project zones (Sikasso, Koulikoro and Bamako). Moreover, it focused on listeners that had already accumulated 4+ KMs listened by the time of the survey, conducted in October 2025. Survey respondents may therefore represent a category of early adopters with different outcomes compared to the wider population of listeners having listened to 4+KMs by June 2026.

	Total #	Confirmed horticulture producers ¹¹	Reporting income increases of 10% or more	Reporting income increases of 25% or more
Survey respondents	430	61%	52%	41%
Wider population (with 4+ messages)	112,000	68,000	35,000	28,000

Applying the survey results to this group suggests a significant impact on income improvement. It suggests that around 35,000 listeners may have increased incomes by more than 10 per cent, while more than 28,000 may have increased their incomes by more than 25 per cent. Also, as the service is still in operation and listeners actively engaged, positive benefits should accumulate to new and existing farmers alike.

Given that the project spent approximately USD 240,000 on this intervention, this intervention cost an estimated USD 6.85 per farmer that increased its income by at least 10 per cent, and USD 8.57 per farmer that increased their income by at least 25 per cent¹².

Lessons learned

The introduction of the 3-2-1 service has had substantial outreach, which translated into tangible agronomic and economic benefits for smallholder farmers. So, what led to the success? We zeroed in on three key contributing factors including: (i) sectoral context; (ii) drivers of engagement; and (iii) design of practical voice content.

Sectoral conditions

Several characteristics of the horticulture sector in Mali likely made the intervention particularly well-suited to the provision of advice through IVR technology.

► Characteristic	► Why it matters
Large number of remote, dispersed smallholders	Vegetable farming has boomed in recent decades in Mali, and many farmers are located in remote areas of Mali, where they have limited access to extension services or other reliable sources of technical advice. This made IVR a valuable complement to existing advisory systems for a large potential audience.
Knowledge- and labour- intensive production	Vegetable farming involves many tasks and decisions throughout the production cycle. Mistakes in nursery management, soil preparation, spacing, irrigation, fertilisation, pest control, harvesting or storage can have major implications for yield and quality. This creates substantial scope for practical advice to improve outcomes.

¹¹ 261 respondents out of 430 people called (representing about 60.7 per cent overall) reported they were horticulture producers. 91 (or about 21 per cent) said they were not horticulture producers, while the rest said they did not know Viamo or had never used it. As previously mentioned, this might also be due to phone sharing as a result of which the person responding to the survey might not have been the person who accessed Viamo from the phone reached.

¹² This does not include overhead or project staff costs, which would increase the overall cost of these interventions, but were difficult to estimate.

Large and widespread productivity gaps	Productivity is very low in the vegetable sector in Mali, with farmers often relying on inherited or improvised practices rather than deliberate crop management. Such conditions are often found in sectors with low barriers to entry and many relatively inexperienced producers.
Short production cycles	Because vegetables produce results within a few months or even a few weeks, farmers can quickly observe whether new practices are beneficial. This rapid feedback likely reinforces learning and encourages continued adoption.

Drivers of engagement

Even where IVR is well-suited to the sector in question, widespread and sustained use depends on several additional factors, not all of which are within the control of development projects.

► Factor	► Explanation
Large, existing farmer-user base	By the time the messages were launched, the 3-2-1 service had already been operating in Mali for almost ten years and had accumulated hundreds of thousands of users, of which 45 per cent were estimated to be involved in agriculture. The wide reach of the messages was likely due to this large pre-existing audience already familiar with the platform.
Complementary promotional channels	The combination of a promotional robocall on a broadly relevant horticultural practice with promoting the service through rural radio programmes, agricultural events and engagement with public extension officers drove more awareness.
Low-friction access	Usage increased sharply after the minimum-balance requirement was removed and declined after it was reinstated, which shows that even a small barrier or uncertainty about whether a call will consume credit can strongly affect uptake.

Together, these findings suggest that engagement depends both on making users aware of relevant content and on minimising the effort and uncertainty involved in accessing it. Questions remain on the drivers of repeat engagement, however, which are also likely to depend on the perceived usefulness of the content and the ease with which users can find and return to relevant advice.

Message design choices

Several design choices likely increased the usefulness, durability and potential value for money of the substantial upfront investment made by the ILO to develop the content.

► Lesson	► Explanation
Build on existing technical guidance and message design principles	Developing the content required significant agronomic expertise and extensive back-and-forth to ensure advice was technically sound, and easy to understand and act upon. Future interventions could substantially reduce costs by building on existing technical guidance, adapting previously developed content like extension materials where appropriate, and leveraging message design principles established through previous IVR projects.

Focus on attainable, high-value practices	Each message typically centred on a small set of key actions, explaining what farmers should do and why it mattered. Survey respondents frequently recalled and reported applying similarly concrete recommendations.
Standardise content where possible	The project used several messages, such as on crop rotation, fertilizer use and irrigation best practices across multiple crops. Developing modular content that can be reused across multiple crops, where appropriate, reduces production costs without sacrificing the appeal of on-demand, crop-specific guidance for users (since users still reach the messages by selecting crop and stage).
Maximise “life expectancy” of content	Once developed, IVR content can continue to be accessed at relatively low additional cost. Focusing on “timeless” practices rather than promoting particular technologies or inputs is likely to increase the long-term relevance of content and reduce the need for costly updates.

Together, these design choices show that the value of IVR content depends not only on production cost, but on whether the messages are technically credible, actionable, easy to navigate, reusable, durable and connected to an effective delivery channel.

Conclusion

The An Ka Baara experience demonstrates the potential of voice-based services to make practical technical advice available at significant scale. Platform data demonstrate broad reach and substantial use, while survey results provide evidence of recall, application and reported production and income benefits among more engaged users. Three elements appear particularly important: content that users can understand and act upon; access that is genuinely easy and affordable from the user’s perspective; and delivery arrangements that create sufficient value for the platform provider, mobile network operator and relevant public institutions.

IVR was designed as a complement rather than a substitute for field-based advice and to wider interventions addressing inputs, finance and other constraints. The implications also extend beyond horticulture: similar voice-based models may be relevant wherever practical guidance can be standardised, delivered in appropriate languages and applied without continuous individual diagnosis (for example, in farm business management, entrepreneurship, occupational safety or skills reinforcement). From a market systems development perspective, the central question is, therefore, not only whether voice technology can reach people, but whether useful content, accessible delivery and viable institutional and commercial incentives can continue beyond the initial project investment.

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