60 __ decibels

Are digital tools meaningful for farmers?







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About 60 Decibels

<u>60 Decibels</u> is the world's leading customer insights company for social impact. We bring speed and repeatability to social measurement, making it easy to listen directly to the people who matter most.

Our network of 1,400+ researchers in 85+ countries gives you global reach. Couple this with standardized questions across thousands of projects and you get the largest data set of social performance benchmarks worldwide — with a focus on Financial Inclusion, Off-Grid Energy, and Agriculture value chains. These data help investors, funders, Fortune 500 companies, and NGOs understand their impact performance relative to their peers.

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Contents

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Above all, we thank the farmers who shared their time and voices with us. Running a farm is demanding, and we recognize the value of your time. Your experiences and perspectives are at the heart of this report, and we hope to have represented them well.

Implementing Partners







learn We about from farming our grandparents, but they don't all know about modern techniques. Now, simple. it's We SO not need do to like before travel information. to et get anything We can we need via phone.

32, Ethiopia

Metric Glossary

Digital Farmer Service (DFS)

Digital solutions provided by institutions, including public, private, or nonprofit entities dedicated to delivering at least one of five essential agricultural services digitally: information, inputs, markets, credit, and insurance. Engagement with DFS providers can occur directly via farmers' mobile phones or through digitally-enabled agents using various digital tools. The digitization of service delivery must be experienced by the farmer firsthand.

Type of DFS

- Information and Advisory: Assists farmers in accessing and managing farming-related information and advice digitally, covering agronomic practices, weather advisory, livestock management, and pest and crop disease management.
- Inputs and Equipment: Enables farmers to purchase or rent farm inputs and equipment digitally, including crop and livestock inputs and farm equipment such as tools and machinery. Digitally, farmers can search for/order inputs or equipment, make payments, and arrange pick-up/ delivery
- **Market Access:** Assists farmers in making informed decisions about selling their produce based on market information, connecting with buyers, managing storage and transportation, and receiving payments for their sales
- **Credit:** Enables farmers to access farming credit and make credit-based purchases digitally. This includes processes like applying for loans, receiving funds, making loan payments, purchasing, or renting inputs and equipment on credit, while excluding informal lending.

Meaningful Use

If a DFS altered some aspect of their farming season in a significant way. The criteria for meaningful use are:

- Has 'all' or 'most' of their needs met by the DFS
- Gives a Net Promoter Score (NPS) of 9 or 10
 (indicating high satisfaction)
- Reports a 'much better' farming season because of the DFS

Net Promoter Score® (NPS)

A common gauge of customer loyalty. It is measured through asking customers to rate their likelihood to recommend your service to a friend on a scale of 0 to 10, where 0 is least likely and 10 is most likely. The NPS is the % of customers rating 9 or 10 out of 10 ('Promoters') minus the % of customers rating 0 to 6 out of 10 ('Detractors'). Those rating 7 or 8 are considered 'Passives'

List of Abbreviations

DFS: Digital Farmer Service **NPS:** Net Promoter Score **KALRO:** Kenya Agriculture and Livestock Research Organization

We got good quality seeds without paying upfront paid we after harvest. For someone struggling, this helped me since didn't have the initial capital for sunflower seeds. was then ab⊥ e plant and still have pay schoo enough to fees

62, Kenya

Executive Summary

Digital solutions offer the potential to transform smallholder agriculture. With over a thousand agtech companies in the Global South, investors seek solutions that can scale—but these are hard to identify. Performance metrics such as "registered users" or "number of downloads" do not truly measure farmer adoption of a tool and reveal little about the actual farmer experience.

We set out to create a simple way to determine if farmers use a tool 'meaningfully'-specifically, whether the digital solution truly changes any aspect of how they manage their farm.

60 Decibels partnered with 18 agtechs and interviewed users about their experiences with these services. We examined the connection between satisfaction and reported outcomes, ultimately defining 'meaningful use' in a way that is easy to measure, relevant across all DFS types, and predictive of impact.

The purpose of the study was to define a measure of meaningful use. In doing this, we captured valuable insights from nearly 5,000 DFS users. This report summarizes those insights and elevates those voices.

Here's what we found:

1. Simple, standardized, farmer-reported metrics tell you a lot about a digital service.

DFS providers can ask farmers three simple guestions about their service to gauge meaningful adoption of their solution:

> Would you recommend the DFS to a friend?

> To what extent did the DFS meet your needs for that service type this season?

> Was this season the same, better, or worse because of the DFS?

These questions can be asked to farmers using any type of DFS, anywhere, and farmers can easily understand and answer them. The responses are highly correlated with self-reported outcome measures such as crop quality, production, investment, and earnings.

READ MORE ON PAGE 10

2. 'Active use' data is not commonly tracked by agtechs.

We initially planned to analyze company-defined measures of 'active use' alongside farmerreported engagement and outcomes. 'Active use' can be defined in various ways, such as monthly logins, app downloads, sales made through the service, or the frequency of reading messages. However, only 5 out of the 18 DFS companies were able to provide active use data. The analysis of these 5 companies showed no correlation between active use and meaningful use.

Additionally, we measured frequency of use, asking farmers how often they used the DFS, and analyzed frequency against meaningful use. We did not find a relationship between frequency and meaningful use. This reinforced our hypothesis that operational metrics are insufficient to predict the value a DFS provides to farmers.

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3. Digital tools are reaching underserved female farmers.

The benefit of digital services is often in their ability to reach more farmers at a lower cost than inperson services. 60% of the farmers surveyed report receiving a service for the first time and 55% say they have no access to alternatives, which is below the 60 Decibels Global Farmer Benchmarks. However, these rates vary with gender. 79% of females say they did not have prior access to a similar service and 77% do not have access to viable alternatives, indicating that DFS are increasing underserved women's access to services.

READ MORE ON PAGE 12 AND PAGE 14

4. Meaningful use is highest for digital information services.

Among surveyed information DFS users, 48% are meaningfully engaging with the serviceindicating that nearly half of farmers are using digital services in ways that genuinely enhance their farming. Meaningful use of input services was nearly as high, at 45%.

However, with fewer than half of users fully engaging with information or input DFS, there is still room for improvement. Digital providers can refine their offerings to better meet farmers' needs, creating services that deliver more value and foster stronger engagement.

READ MORE ON PAGE 15

5. Farmers who have used DFS for more than one year report greater impacts.

Farmers who have used DFS for over a year experience greater impacts on production, earnings, and investments, with especially strong effects among those using market access services. For example, 89% of farmers who have used market access services for over a year report increased earnings due to DFS, compared to only 12% of those using them for less than a year. This likely reflects growing trust and the cumulative benefits of sustained service use.

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11

Introduction

Nearly 500 million smallholder farmers grow a third of the world's food, yet many face significant challenges: remote locations, limited market access, inaccessible inputs for resilient crops, and a lack of critical information to sustain their farms.

Digital solutions are increasingly seen as a way to overcome these challenges by providing essential information, inputs, market connections, and credit, without relying on in-person interactions. But impact is only possible with sustained adoption of these tools by farmers.

So far, the digital agriculture sector has largely measured penetration through metrics like the number of providers, registered farmers, or app downloads. But these figures don't tell us if the farmers are truly incorporating the tools into their farming operations. Imagine a farmer is subscribed to an SMS advisory service. This farmer could read the messages daily and adopt the recommended practices—the farmer could also ignore the message or change phone numbers and never receive them. Either way, the farmer would be counted as a 'registered user.'

This leaves agtech investors without a clear metric that predicts if an innovation will scale and sustain. To bridge this gap, the Bill & Melinda Gates Foundation, Busara Center for Behavioral Economics, and 60 Decibels have partnered to develop a farmer-centric approach for assessing adoption of Digital Farmer Services (DFS) by smallholder farmers.

So how are we measuring this?

We developed a 'meaningful use' metric to assess if farmers are meaningfully incorporating DFS into their farming or business practices. This could be through tangible improvements in farm outcomes, access to previously unavailable services, and more efficient, convenient, or higher-quality operations through digital methods. This drives sustained adoption across seasons, leading to scale.

'Meaningful use' is the final stage in our DFS engagement ladder. The ladder progresses from farmers aware of DFS, to those with access, those using it, and ultimately, those engaging with it meaningfully.

To create this measure, we conducted focus groups, expert interviews, and partnered with 18 DFS providers across Kenya, Nigeria, India, Ghana, and Ethiopia. We surveyed up to 275 farmers from each provider and analyzed operational data to understand the link between 'active use' and real value.

Our goal was to arrive at a simple measure of meaningful use for DFS, which we've published in a brief guide. But in the process, we captured insights from the 4,800 farmers we spoke to that use DFS. This report summarizes those insights.



A Guide to This Report

4851 Farmers



Companies

We gathered insights from users of 18 different DFS providers across Kenya, Nigeria, India, Ghana, and Ethiopia. The users we spoke to represent four key service types:

• Information and Advisory Services (52%):

Our partners offer personalized weather updates, crop and livestock disease identification, pest management tips, and video classes on farming techniques.

• Inputs and Equipment Services (22%):

These services provide tools for purchasing or renting farm inputs like seeds, fertilizers, dry bags, and tractors, with options for ordering, payment, and delivery.

Market Access Services (17%):

These providers connect farmers with buyers, offers crop pricing information, and supports secure transactions, storage, and transport.

• Credit Services (16%):

These services enable access to formal farming credit, loan applications, repayments, and credit-based purchases.

Some providers offer multiple services, such as bundled information and input services, so some respondents and companies are counted in multiple service type categories.

The report begins with an overview of the farmers and methodology for assessing meaningful use, followed by an exploration of how farmers access and engage with DFS. It then analyses the value derived from DFS, including farmers' satisfaction and impact on the farming season, and assesses DFS effects on productivity, crop quality, and resilience. The report concludes with an in-depth look at how female farmers engage with DFS.

5

Countries

1.6 Hectares Farmed (Median)

Who did we talk to?

We interviewed 4.851 farmers between February and August 2024.

Most participants were from Kenya, 35%, and India, 33%. An additional 21% were from Nigeria, 6% from Ethiopia, and 5% from Ghana.

Nearly all farmers interviewed grow crops, with 3 in 5 cultivating maize, and 87% also raise livestock. The median cultivated land is 1.6 hectares, and farming makes up about three-guarters of each household's income.

A third of farmers surveyed have a university education, and 80% have access to a smartphone, with 74% owning one. Smartphone ownership is more common among men, younger farmers, and those with a university degree.

The median portion of household income derived from farming is 75%, highlighting the importance of farming in their livelihoods. Additionally, 71% of farmers report easy access to emergency funds, indicating relatively strong financial resilience.

The profile of the farmers we spoke to varies slightly depending on the type of DFS. Credit users in our sample are predominantly male (92%), similar to market access users (88%). In contrast, inputs and equipment providers have the highest proportion of female users (38%).

The insights in this report represent the 18 DFS providers we partnered with and do not reflect the entire DFS ecosystem.

52% of farmers 10 Providers Information & Advisory

17% of farmers 3 Providers Credit

22% of farmers 6 Providers Inputs & Equipment

16% of farmers 4 Providers Market Access

Who did we talk to?





Dimensions of the Meaningful Use Index

We developed the meaningful use methodology by using data from this study to correlate our meaningful use indicators with perceived impact data for each service type. The indicators that showed the strongest correlations with perceived impact and minimal overlap with one another were selected to build the index.

'Meaningful use' offers several key benefits:

- It focuses on value rather than just operational > use
- It provides an assessment of whether farmers > are on the path to achieving long-term impact from DFS
- It is standardized to compare across different > types of DFS services and modalities
- It is designed for quick and easy data collection > by providers, increasing sector-wide data availability

To read the full methodology, please see the Appendix.



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All my friends wish they were as lucky as me because I got assistance from the company. I got access to fertilizers and pesticides when I couldn't afford anything. In the end, they helped me get income for my family from my farming.

- Female, 40, Kenya

(A)

Net Promoter Score® (NPS)

On a scale of 0-10, how likely is the farmer to recommend the DFS service to a friend or family member, where 0 is not at all likely and 10 is extremely likely?

To be a meaningful user, a farmer must :

> Give a Net Promoter Score (NPS) of 9 or 10 (indicating high satisfaction)

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DFS Effectiveness in Meeting Farming Needs

Is the DFS meeting none, some, most, or all of the farmers' specific needs related to the service they are providing? For example, is the DFS meeting all of the farmers' crop information needs?

To be a meaningful user, a farmer must report :

> 'All' or 'most' of their needs met by the DFS

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Impact of DFS on the Overall Farming Season

Overall, because of the DFS provider, has the farmers' experience of this most recent farming season been better, the same, or worse?

To be a meaningful user, a farmer must report:

> A 'much better' farming season because of the DFS

02

Access and Engagement with DFS

The farmers we spoke to had been using the digital solutions for a median of 1 year.

In this section, we focus on key engagement metrics like farmers' prior access to services, how often they use them, and the availability of alternatives. These metrics give us valuable insights into how digital tools benefit farming communities. By evaluating how accessible and user-friendly DFS are, we can determine if they are helping make farming more efficient and inclusive, which is a core goal of providing services digitally.

Median Tenure (Months)

Q: How many months back did you start interacting with [Company]?





Are Digital Tools Meaningful for Farmers? 10 3 in 5 farmers report accessing a service for the first time, and over half lack access to a good alternative.

Of those who report having a good alternative, 2 in 5 say that alternative is non-digital.

79% of female farmers report using a DFS for the first time, compared to 56% of male farmers. In addition, only 17% of women have access to alternative services, compared to 46% of men. This suggests that DFS is addressing a gap by providing female farmers with resources and support they previously lacked.

Access also varies by age. Older farmers (40+) are more likely to report this as their first time accessing a similar DFS (62%) compared to younger farmers (58%). They are also less likely to have access to alternatives (60%) compared to younger farmers (51%).

Collectively, the 18 DFS providers in this study are below the 60 Decibels benchmark for first access (72%) and no access to alternatives (65%.) This could indicate that DFS are not reaching the most underserved farmers, relative to the agricultural social enterprises that constitute the 60dB benchmark and are a mix of digital and in-person offerings. This would align with 80% of the respondents having access to a smartphone and 30% having completed university education indicators which suggest the respondent population is relatively well-connected.

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Through the app, I get accurate weather information and learn about fertilizer, seeds, and better farming methods. I also sell my crops without any middlemen and get notifications just by sitting in my home on my mobile.

- Male, 35, India

Accessing Service for the First Time

Q: Before [Company] did you have access to [product / service] like [DFS] provides? % answering 'no'



Users without Access to Alternatives

Q: Could you easily find a good alternative to the service like the one [DFS] provides? % answering 'no'





Farmers use DFS during <mark>5 months per year, with a</mark> median of 4 interactions monthly.

Usage varies by service type: farmers using information and market access services engage the most, at 8 times per month, while those using credit and inputs services engage the least, at 2 times per month. This difference is expected, as farmers may check weather updates or revisit informational videos more frequently, while those using credit services might only log in occasionally to check their balance.

We examined the relationship between frequency of use, often called 'active use,' and meaningful use, and found they are not consistently correlated. This supports our initial hypothesis that to better measure the impact on farmers, we must move beyond the traditional 'active use' metric and focus on the value created for them. While active use is linked to meaningful use for information and credit services, this correlation is not observed for market access or inputs and equipment services.



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Because I started using the service, I was able to buy two tractors from the profit I made in the first year I started using it. So presently because of my achievement, almost my entire community is using the service!

- Male, 37, Nigeria



Q: In the last 12 months, how many months did you use [DFS]?



Times Used Per Month (Median)

Q: On average, how often did you [use service] during those months?*







Are Digital Tools Meaningful for Farmers? 12

Convenience

Overall, 3 in 5 farmers find it 'much easier' to access farming services through the DFS.

Farmers using input services report the greatest improvement in ease of accessing inputs due to the DFS, compared to other services. Easier access to inputs was strongly linked to increased production. Among those who found inputs easier to access, 55% reported a significant income increase because of the DFS, compared to 39% who found access only slightly easier. A similar trend was seen with information services. This suggests that more convenient access to essential services, made possible by digital tools, enables farmers to improve their overall farm performance.

More female farmers report that using information DFS made accessing farming information much easier, with 72% of women saying it was 'much easier' compared to 55% of men. This trend, however, does not apply to other types of services.

Convenience

Q: Did using the [DFS] [product/service] make it easier or harder for you to do [farm activity]?



Much easier Slightly easier Neither Slightly harder Much harder

feel more confident knowing that I might receive warning messages on my phone in case of unfavourable weather, such as floods. will help me epare accordingly for such occurrences

03

Meaningful Use

35-48% of farmers are 'meaningful users,' integrating the DFS into their farming practices.

This is higher than the national benchmark for Kenya (27%), which likely reflects the selection of companies that participated in this study.

The highest proportion of meaningful users is found among those using information services (48%) and input services (45%). Meaningful use is consistent across different age groups and genders.

However, with less than half of users meaningfully engaging across all DFS services, there is clear potential for improvement. This indicates that digital providers have an opportunity to better align their offerings with farmers' needs, creating services that deliver more tangible value and encourage deeper engagement.

In this section, we provide a detailed breakdown of the meaningful use indicators mentioned above and explore actionable strategies that providers can adopt to increase their rate of meaningful users.

Meaningful Use % meaningful users



Meaningful users

By addressing the gaps in engagement, providers can foster stronger connections with farmers and enhance the overall impact of their services.



use methodology, please see the Appendix.

Farmers' Definitions of 'Use' vs. 'Meaningful Use'

Many farmers define 'meaningful' usage of DFS as improvements in their farming, such as higher crop and livestock yields.

Busara conducted interviews to understand how farmers define both 'use' and 'meaningful use' of DFS, ensuring that our approach to defining meaningfulness accurately reflects farmers' perspectives.

Farmers define 'using' a DFS as engaging with the service to gain immediate, practical benefits. This includes receiving helpful information through text messages, phone calls, or in-person advice-that directly supports their farming activities. For example, farmers describe 'use' as applying DFS guidance, purchasing inputs through the service, or selling produce to or through the service. In essence, 'use' is about leveraging DFS tools and resources to support their daily farming tasks.

For farmers, 'meaningful use' goes beyond basic interaction and is defined by clear, actionable, and impactful guidance. They consider a DFS meaningful when it offers resources and advice that bring noticeable improvements, such as modern techniques that boost productivity. Farmers also see meaningful use as reliable access to essential resources like seeds and fertilizers that strengthen their livelihoods. To them, 'meaningful' means that the DFS provides lasting benefits, supporting their farming success and improving their overall quality of life over time.

This perspective is aligned with our definition of meaningful use, validating our approach. To learn more about cognitive debriefing approach, please see the Appendix.

66

Just like my family, fertilizer for my farm and my livestock are all meaningful to me.

- Male, 37, Nigeria

The wonders animals. suggested treatments that livestoc and more definitely them looking to their health

advice worked for mv They made my ier health P C acti recommend anvone Lmprove animal's

Male, 45, India

Collectively, the DFS providers studied have an NPS of 51. Satisfaction is highest among information DFS users, who value the accuracy and timeliness of the services.

The Net Promoter Score (NPS) is a key measure of farmer satisfaction and meaningful use of DFS, capturing how likely farmers are to recommend these services based on their experiences. The NPS for these DFS is above the 60dB farmer benchmark of 43, indicating they are wellregarded and provide valuable benefits to farmers. However, there are still opportunities to further increase satisfaction.

In Kenya, the NPS among surveyed companies is 52, which is above the national DFS average of 38. This indicates a relatively high satisfaction rate among these companies compared to the broader market.

Farmers who experience clear benefits from using DFS, such as improved crop quality and higher productivity, are significantly more likely to recommend these services. The key drivers of satisfaction vary across DFS service types:

- Information Services: Farmers report high satisfaction due to reliable, timely data on weather, pest control, and market trends, empowering them to make informed decisions.
- Input Services: Farmers appreciate access to high-guality, affordable inputs like seeds, fertilizers, and pesticides, which boost yields and resilience.
- Market Services: Farmers value real-time pricing and fair sale opportunities, which reduce reliance on middlemen and foster trust, enhancing satisfaction with market-oriented DFS.
- **Credit Services:** Farmers benefit from flexible financial options aligned with farming cycles, such as low-interest rates and harvest-timed payment plans, building trust and increasing the likelihood of recommendations.

Gender differences in satisfaction also stand out. Female farmers report a higher NPS than male farmers—55 versus 50—especially in information services, where women score an NPS of 64 compared to 55 for men.

While satisfaction is generally good, some detractors highlight areas for improvement that could further enhance DFS experiences:

- Information Services: Detractors request better customer service and support, improved communication, and enhanced diagnostics and treatment options to make the information more actionable and accessible.
- Input Services: Feedback from detractors includes a desire for better product quality, improved delivery timelines, and clearer communication around product details and support.
- Market Services: Detractors would like to see better prices, improved app functionality, and more accurate and complete market information to guide their sales and purchasing decisions.
- Credit Services: Detractors point to the need for better customer service, more competitive prices (particularly in warehousing or mixed market and credit services), improved communication, and greater payment flexibility that aligns with farming cycles.

Overall, DFS drive high levels of satisfaction, and targeted improvements in these areas can further boost both satisfaction and meaningful use, strengthening farmer advocacy and deepening impact.

Net Promoter Score® (NPS)

The Net Promoter Score (NPS) is widely used as an indicator of customer satisfaction and loyalty. It is measured by asking customers to rate, on a scale of 0 to 10, how likely they are to recommend a company's product or service to a friend—where 0 means 'not at all likely' and 10 means 'extremely likely'. NPS is calculated by subtracting the percentage of 'Detractors' (customers who rate from 0 to 6) from the percentage of 'Promoters' (those who rate 9 or 10).

Our analysis shows that NPS also strongly predicts the impact of services on farmers, making it a vital component of our "Meaningful Use" score.



Net Promoter Score

Q: On a scale of 0-10, how likely are you to recommend [DFS] to a friend or family member, where 0 is not at all likely and 10 is extremely likely? (Overall = 4851 | Information = 2534, Inputs = 1079, Market Access = 820, Credit = 752)



Effectiveness in Meeting Farming Needs

Less than half of farmers say their DFS provider meets all their needs for the service provided.

We asked farmers if the services provided by DFS meet all their farming needs (for that service), and 45% reported that their needs were fully met. This trend is generally consistent across different service types, though fewer farmers using credit services said all their needs were met. While this shows that DFS providers are meeting many of farmers' needs, there is still a clear opportunity to address remaining gaps and expand their impact.

To better understand the unmet needs, we asked farmers what their DFS providers could offer to better support them. Key areas for improvement include offering more technical and targeted support, such as best practices tailored to specific crops and livestock, large-scale farming techniques, and modern farming methods, as well as providing more financial assistance. We also observed differences across service types:

- Information Services: Farmers seek more timely weather updates and targeted information services, including guidance on cash crops like bananas, cotton, and tomatoes, as well as techniques such as aquaponics and hydroponics.
- Input Services: Farmers are looking for a wider selection of products-such as waterresistant crates, shade nets, weeding machines, chicken feed, and solar panelsalong with more dependable delivery services.
- Market Services: Farmers seek better pricing for their produce and more professionalism from buyers.

Overall, the percentage of farmers reporting that all their needs are met is similar between genders (43% of female farmers and 45% of male farmers). However, for input services specifically, the gap is more pronounced: 39% of female farmers report that all their needs are met, compared to 52% of male farmers.

The ability of DFS to meet farming needs is closely linked to improved outcomes. Among information service users with all needs met, 58% report increased production and improved produce quality, compared to 38% of those with most needs met.

In addition, for market access services, 64% of farmers whose needs are fully met report significant income improvements, and for credit services, 63% report an improved ability to invest.



Ability to Meet Farmer Needs

Q: Think about [service type] you needed for your farm/livestock. Did [DFS] [product/service] meet none, some, most or all of the needs?



Production Change for Information and Input DFS by Ability to Meet Farmer Needs

% reporting 'very much' increased production due to the DFS based on ability to meet farmer needs (n = 1,584)



Half of the farmers we spoke to report a 'much better' farming season thanks to DFS services, largely due to improved crop production and increased income.

Farmers know best how a service affects their farming season, so we asked them directly. Our goal was to gather their insights on how DFS services have changed their season and to identify the key factors driving those outcomes.

Half of farmers report a significantly better farming season due to the DFS, with input services having a slightly greater effect than other service types. Input services provide essential resources like seeds and fertilizers early in the season, directly improving yields and productivity. You can see more on the effect of input DFS on page 23.

Tenure with DFS is associated with reported change to the farming season, with farmers who have used DFS services for over a year more likely to report a significantly better season (56%) compared to those using it for less than a year (48%). This is especially true for input services (64% vs. 55%) and information services (60% vs. 47%). This may be because, over time, farmers become more familiar with the services, adapt their practices, and experience cumulative improvements in production and quality, resulting in better overall outcomes.

The main factors contributing to a better farming season are outcomes like improved crop production and increased income. Key drivers by service type include:

 Information Services: Farmers see better pest and disease control, leading to healthier crops and livestock. Adopting modern farming practices helps them work more efficiently and increase productivity. Improved farm management, with tools for irrigation and planting, reduces crop loss and labor costs, while making better decisions based on weather conditions optimizes their operations.

- Input Services: Farmers experience healthier livestock and improved crop yields, driven by access to better-quality seeds, fertilizers, and pesticides, leading to more productive and resilient farms.
- Market Services: Farmers achieve stronger sales and better market access, allowing them to sell their products more efficiently and at better prices, ultimately increasing their income.
- Credit Services: Farmers benefit from improved access to loans and financial services, enabling them to invest more in their farms, expand operations, and enhance productivity throughout the season.

There are also gender differences. Female farmers report a better farming season due to DFS compared to male farmers (58% vs. 50%), especially in information services, where 64% of women report a better season compared to 48% of men.

While most farmers report a good season, some experienced a worse season due to issues with DFS providers. The main problems included poor pest and disease management advice, leading to crop damage, insufficient training, recommendations for ineffective medication, and a lack of veterinary support. For information services, slow responses, inadequate guidance, lack of expertise, and missing local market information also contributed to lower farm production.

As you will read in the following section, we typically ask farmers about changes most directly linked to the service type. However, this metric demonstrates that a more general question around perceived impact can be asked across all DFS service types.

Impact on Overall Farming Season

Q: Overall, has your experience of this most recent farming season been better, the same, or worse because of the [DFS]? Has your experience of the farming season been:



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I got regular information on weather and rainfall. Before I had to ask other farmers for such information but now I receive this information directly on my mobile phone.

- Male, 40, India

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Perceived Impact of DFS

More than half of farmers report improvements in produce quality, production, earnings, and farm investments as a result of using digital services.

In developing the 'meaningful use' measure, we collected data on farmers perceived impacts for the purposes of correlation analysis.

In this section, we take a closer look at farmerreported impact data in its own right to explore how different types of DFS are changing farmers lives and outcomes.

For each type of DFS, we captured perceived impacts most relevant to that service. For information services, we focus on changes in farming methods, production, and quality. For input services, we assess the impact on access to appropriate inputs, production, and quality. For market access, we evaluate farmers' access to reliable markets and their earnings. For credit services, we explore how they affect farm investments.

The impact varies depending on how long farmers have been using the service, with some differences also observed by gender.

We also find that DFS can positively impact farmers' resilience to climate shocks. 2 in 5 farmers feel more prepared, expect quicker recovery times, and report increased knowledge in managing climate-related challenges as a result of using DFS. Read more about climate resilience on page 26.



Perceived Impact of DFS

Farmers using information and market DFS for over a year experience greater impacts.

This may reflect the gradual increase in trust and the cumulative benefits of continued service use over time. We examined increased production for information and input services, higher earnings for digital market services, and credit access for digital credit services.

22% of users reported challenges with the digital services, which impact both adoption and outcomes. The main challenges include delays in service delivery, technical issues, and insufficient communication from the provider.

To read more about this, and the impact each type of DFS service, see the deep-dives from page 22-<u>25</u>.

Q: Have you experienced any challenges with the [DFS]? (n=4850)

The PMF Survey's Global Benchmark on Scalability is 40%. That is, if over 40% of users would be "very disappointed" if they couldn't use a given product, that product has strong potential for sustainable, scalable growth. All DFS studied meet this threshold, with 40% or more of users saying they would be 'very disappointed' if they lost access to the service. This is is highest among input and credit service users.

Meaningful users are more likely to report being "very disappointed" if they lost access to the service.

In the cognitive debrief interviews, information DFS users expressed a strong reliance on the DFS for agricultural information, seeing it as crucial for improving practices and maintaining productivity. They noted that losing these services would disrupt their plans, reduce yields, and lead to disappointment. Although they could rely on prior knowledge or alternative sources, they emphasized that replacing the timely advice and the community support provided by DFS would be difficult.

Impact of DFS by Tenure

% of farmers reporting increased production, earnings, or investments due to DFS, by tenure



Sustainability of DFS

Q: How would you feel if you could no longer interact with the [DFS]?





60 __ decibels

Challenges



Are Digital Tools Meaningful for Farmers?

Impact of Digital Information and Advisory Services

Half of the farmers we interviewed use information services. Of these, one fifth are female. Most farmers using these services are under 40, and half have been using them for less than a year. The majority have at least a secondary education.

The information services in our study cover a wide range of topics, including weather updates, crop management practices, land preparation, pest and disease control, cattle farming (such as vaccinations, insemination, and calving), feed management, shelter, water conservation, soil testing, kitchen gardening, and beekeeping.

In cognitive debriefing interviews, Busara found that before using DFS platforms, farmers mostly relied on traditional methods and community knowledge, limiting their access to modern techniques. With DFS, information is now more accessible, allowing farmers to make better decisions and boost productivity. Farmers who applied DFS guidance reported that farming became easier, and yields improved, especially for crops like groundnuts and maize.

Among users, more than half said their farming methods significantly improved, with 71% of female farmers reporting a positive change compared to 50% of male farmers.

When asked how much of the information they applied to their farms on a scale of 0 to 10, most farmers indicated they used much of it, though fewer than half said they applied all of it.

Half of farmers using information DFS report that their produce quality has "very much improved," and 43% say their production has "very much increased" due to the service. These results are above the 60dB farmer benchmarks, where only 35% report this quality improvement and 38% report production increases.

Farmers who fully applied the information reported better outcomes than those who did not. Among these farmers, 70% reported improved farming methods (compared to 40% who did not fully apply the information), 57% achieved higher production (versus 31%), and 61% saw better crop quality (compared to 40%). The main reasons for not applying all the information were financial limitations and lack of access to resources. Addressing these barriers would enhance the impact of information services, allowing more farmers to implement the advice and improve their outcomes.

Female farmers see greater improvements in production and quality from using information DFS.

Information DFS have significantly improved farmers' practices, leading to better quality and higher yields of produce. Farmers who fully apply the information and advisory services see the greatest benefits. However, some users who do not apply all the information face barriers such as financial constraints, which prevent them from fully using these services. Addressing these challenges by offering bundled services that make inputs more affordable and accessible, along with more targeted and relevant information, could help extend the benefits to more farmers and ensure a broader, more consistent impact for farmers.

52%

of farmers we spoke to use digital information services

Application of Information to Farming

Q: On a scale of 0-10, how much of the information you received from [information DFS] did you apply to your farming, with 0 being none of the information and 10 being all of it? (n = 2534)



The primary reasons for not applying all the information are financial constraints and lack of access to resources.

Change in Way of Farming, Production, and Produce Quality because of Information DFS

Q: Has your [way of farming/production/produce quality] changed because of the information DFS? (n = 2534)



66

I went from being a casual worker to a recognized poultry farmer thanks to the provider's training I attended. Now, I run my own farm and earn enough to support my family.

- Male, 48, Kenya

Decreased / Got Worse No change Slightly Improved / Increased Very Much Improved / Increased

Impact of Digital Input and Equipment Services

1 in 5 farmers we surveyed use digital input services. Of these farmers, 38% are female, and 44% have been using the services for over a year, with an average tenure of 1 year and 4 months. The types of inputs farmers are receiving with these services are seeds, fertilizer, pesticides, storage bags, tractors, etc.

4 in 5 say that the DFS has improved their access to 'appropriate' inputs, meaning they are wellsuited to their land and farming conditions. Additionally, 90% report that the quality of the inputs they now have access to has improved.

A quarter of farmers say that DFS helped lower input prices, another guarter saw no change, and half reported that prices increased with their DFS provider. This indicates there is room to improve affordability.

2 in 3 users report receiving significantly betterguality products through the input DFS compared to what they used previously. Additionally, 9 in 10 input DFS users report improvements in both the quantity and quality of their produce as a result of the service.

Half of the farmers report that the quality of their produce has 'very much' improved due to the input DFS, and 65% say their production has 'very much increased.'

Male farmers are more likely to report increased production after using digital input services (57%) compared to female farmers (36%).

22% of users reported challenges with the digital service, mainly including delivery delays, poor customer service, limited product availability, low product quality, and technical issues with the inputs provided. Farmers who faced fewer challenges were more likely to report significant improvements in produce quality and overall production. Reducing these challenges can enhance impact.

Ultimately, digital inputs are transforming the way farmers access resources, improving both the quality and efficiency of their farming. As more farmers embrace these tools and overcome existing challenges, the potential for even greater success in agriculture becomes increasingly promising.

22%

of farmers we spoke to use digital input services

66

I would say that provider really understood what farmer's need and their pain points, which enables us to become better farmers. They provide us with farming equipment on credit, which has helped my farming overall.

- Male, 33, Kenya

Change in Access to Appropriate Inputs, Input Quality, Production, and Produce Quality because of Input DFS

Q: Has your [access to appropriate inputs/input quality/input price/production/produce quality] changed because of the input DFS? (n = 1079)



Very Much Improved / Increased

Slightly Improved / Increased

No change

Decreased / Got Worse



Impact of Digital Market Services

Farmers use market access services to sell their produce and connect with buyers. For this report, we also classified services that provide market information as part of market access services.

Among the surveyed farmers, 17% use digital market services. Nearly 9 in 10 of these users are men, and 64% are under the age of 40.

83% of market DFS users report improved access to buyers, while 86% of farmers report receiving better prices through digital market services and an increase in income from farm sales. On average, farmers experience a one third increase in their income through these services.

86% of farmers have gained more confidence in conducting sales through DFS, mainly due to realtime price updates, increased profits, and improved market transparency. However, farmers with less confidence expressed concerns about the reliability of the service and accuracy of the information provided.

Though the overall impact is similar for male and female farmers, women report a higher average income increase (45% compared to 31% for men). This may be because women face more barriers to market access, and digital services help them overcome these challenges, leading to greater gains.

Farmers using the service for over a year report a greater income increase (38%) compared to those using it for less than a year (25%). Longer-term users likely benefit from more time to optimize the service, build stronger buyer relationships, and see cumulative effects over multiple seasons.

There is still space to improve these services as 27% of users reported experiencing challenges with the digital service mainly, low price of produce, poor customer service, and delayed payments. Male farmers report much higher challenges than female farmers (29% versus 15%).

Digital market services are driving significant improvements in buyer access, sales confidence, and income for farmers, especially for those who use the services consistently.

17%

of farmers we spoke to use digital market access services

66

The provider has simplified the selling process for farmers, saving time and effort. I gained a lot of income as I was not paying any transportation for my good. They pay me better prices and transport the goods they bought.

- Male, 40, Nigeria

Change in Access to Appropriate Buyers, Reliable Markets, Price, and Money Earned because of Market DFS

Q: Has your [money earned/access to buyers/reliable markets/fair prices] changed because of the market DFS? (n = 820)*



Very much increased/Much more reliable

Slightly increased/More reliable

No change

Decreased / Got Worse

* For the question on 'reliability of market,' we only asked it to a select group of providers, resulting in a sample size of n=543.

Impact of Digital Credit Services

Credit DFS gives farmers access to different types of credit, such as in-kind (seeds, fertilizers), in-cash (loans for expenses), or credit based on stored produce. These digital providers enable farmers to receive funds, make repayments, and conduct credit-based purchases, excluding informal lending.

Among the farmers we interviewed, 16% use credit services. Nearly 90% of these users are male, 74% have been with the DFS provider for over a year, and most have at least a secondary education. Additionally, 62% of these credit service users are under 40.

Credit enables farmers to hire more labor. purchase better equipment, or upgrade infrastructure like irrigation systems or storage facilities—expenses they might not be able to afford without upfront funds. Nearly half of farmers report significantly increased investments in their farms due to credit DFS. Additionally, half of farmers say they are much better equipped to cover farm expenses and make these critical investments.

23% of users experienced challenges with the digital service, mainly technical issues and insufficient distribution of inputs. Farmers not facing challenges are more likely to report improvements, including better ability to cover farm expenses (55% compared to 19% of those experiencing challenges), increased ability to make investments (55% compared to 27%).

Digital credit services are crucial in helping farmers meet their financial needs throughout the farming season. Despite challenges like technical issues and insufficient input distribution, most users have seen significant improvements in covering farm expenses and making investments. Addressing these challenges will be essential to further enhance the effectiveness of these services and maximize their benefits.

16%

of farmers we spoke to use digital credit services

66

The provider offers very flexible payment terms that are highly favorable for farmers. Thanks to their credit service, we're able to acquire equipment that would have been difficult to procure on a cash basis.

- Female, 30, Kenya

Change in Farm Investment, Ability to Cover Farm Expenses because of Credit DFS

Q: Has your [farm investment/ability to cover farm expenses/ability to invest] changed because of the credit DFS? (n = 752)



Decreased / Got Worse

No change

Slightly increased/More reliable

Very much increased/Much more reliable

* For the question on 'ability to cover farm expenses,' we only asked it to a select group of providers, resulting in a sample size of n=482.



Investments

Impact of DFS on Climate Resilience: Perceived Resilience

2 in 5 farmers feel more prepared, expect faster recovery times, and report greater knowledge in handling climate shocks due to using DFS.

In light of the growing threat of climate change to agricultural communities, we assessed the impact of DFS on climate resilience, focusing on how these services enhance farmers' preparedness, knowledge, and recovery from climate-related events. We asked farmers to reflect on their perceived resilience, specifically how prepared they feel to handle potential climate shocks. This involved assessing how their DFS provider has strengthened their ability to manage future challenges, understand these risks, and recover more quickly.

Our findings show that DFS positively influence farmers' resilience to climate shocks. Information services have a slightly stronger impact on preparedness and knowledge for adapting to climate events, as they directly help farmers manage these challenges.

Credit services are more likely to shorten the expected recovery time after a shock, while market access and input services have a stronger impact on financial resilience to climate shocks.

In addition, female farmers report greater improvements in their resilience from using DFS across three out of four key metrics, with the exception of managing emergency expenses. This could be linked to men typically having greater access to income sources, making it easier for them to handle unexpected costs.



66

The accuracy of their prediction is very high. I often share the information with friends because the alerts help me prioritize my farm activities before the rain starts.

- Male, 43, Nigeria

Impact on Perceived Resilience by DFS Type

% of respondents who say their preparedness, knowledge, recovery, and ability to afford emergencies for future shocks 'very much improved 'due the DFS.



Impact of DFS on Climate Resilience: Perceived Resilience

Impact on Perceived Resilience by Meaningful Users

% reporting improvements in their preparedness, knowledge, recovery, and ability to afford emergencies for future shocks due to the company based on whether they are meaningful or causal users.



Farmers build resilience gradually, with no quick solutions. Using a service or receiving a message once isn't enough-they likely need to use it consistently to build resilience. Further, resilience and satisfaction are self-reinforcing. If a farmer is satisfied with a service, he or she will keep using it, continuing to build resilience.

We find a strong correlation between meaningful use and perceived resilience impacts. Meaningful users are more likely to report that their resilience as increased because of the DFS.

The rovider accessible go through can for website their anything VOU need customer and the care team attends customers to nicely-the are their job. good at

Male, 30, Nigeria

Gender Spotlight

Among the companies we studied, female representation differs across DFS types. Input DFS have 38% female users, while credit DFS have 8%.

Women make up 21% of respondents overall.

In this last chapter, we explore gender-based differences across key metrics to better understand how women experience and benefit from digital agricultural services.

We examine differences in first access, availability of alternatives, satisfaction, and how a DFS helps streamline farm activities. We also assess climate resilience, focusing on women's perceptions of their preparedness and adaptability to climate shocks due to the DFS.

Gender

Gender of farmers interviewed.



This gender lens reveals the ways that DFS influences farming experiences and outcomes for women, offering essential insights for creating more inclusive and impactful agricultural solutions.

Gender Spotlight

There were no gender differences in meaningful use, but we observed that female farmers reported greater improvements in access, convenience, and certain impacts.

Female farmers are more likely to access services like those offered by DFS for the first time, and they are less likely than men to have access to alternative service options. This suggests that DFS may play a critical role in bridging service gaps for female farmers, providing them with essential resources they might not otherwise access.

We also see that DFS are making farming activities easier for female farmers, such as selling produce, accessing information and inputs, and taking out credit. Overall, 71% of female farmers report that these activities are 'much easier' due to DFS, compared to 57% of male farmers.

The only gender differences we observed in impact relate to changes in production are for information and input services. For information services, female farmers report greater improvements in production from using DFS compared to men. In contrast, for input services, men are more likely to say their production has significantly improved due to DFS use.

66

The company has transformed me from a housewife to a fulltime farmer who is generating income through poultry. Now I am always busy and pay my own bills.

- Female, 47, Kenya



Access, Convenience, and Experience by Gender

* All relationships shown in this graph are statistically significant.

% with first time access to services, alternatives, ease of doing activity due to DFS provider, promoters, and facing challenges.

% accessing service for the first time % with no access to Ê alternatives % reporting 'much easier' 2 to do farm activity NPS® \bigcirc -100 to 100 (\mathbf{x}) % not facing challenges

05

Appendix

Methodology

From February to August 2024, 60 Decibels researchers conducted 4851 phone interviews with 18 DFS providers. These farmers were chosen randomly from their farmer database. Our findings accurately reflect farmers with available contact information.

A sample of 4851 farmers provides a confidence level of 90% and a margin of error of 1% in results for total farmer base of 99,666.

| Country | Kenya, India, Nigeria, Ethiopia, Ghana |
|--------------------------|--|
| Contacts Shared | 99,666 |
| Interviews Completed | 4,851 |
| Response Rate | 43% |
| Languages | English, Kiswahili, Hausa, Pidgin, Hindi, Marathi, Telugu, Ibibio, Twi |
| Average Survey Length | 19 mins |
| Confidence Level | 90% |
| Margin of Error | 1% |
| | |

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Benchmarks

The Performance Relative to the 60 Decibels Global Farmer Benchmarks compares the provider's performance to that of 82 agricultural companies and 15,778 farmers worldwide. These companies include a range of agricultural services, not exclusively digital services.

| Indicator | Description | 60dB DFS Benchmark | 60dB Global Farmer Benchmark | |
|-------------------------|---|-----------------------|------------------------------------|--|
| Gender | % of female respondents | 21 | 29 | |
| Tenure with company | median # of months interacting with company | 12 | 39 | |
| First Access | % accessing service for the first time | 40 | 72 | |
| Alternatives | % without access to good alternative for service | 55 | 65 | |
| NPS | Net Promoter Score (-100 to 100) | 51 | 43 | |
| Way of farming | % "very much improved" their way of farming (information DFS) | 54 | 35 | |
| Increased production | % "very much increased" crop production (information DFS, inputs DFS, and credit DFS) | 45 | 38 | |

Meaningful Use Methodology

We developed the 'meaningful use' (MU) measure to assess the value farmers gain from using DFS services. Unlike the traditional 'active use' measure, which only indicates usage frequency, MU directly evaluates the value farmers perceive. Our hypothesis is that MU provides a clearer and more accurate assessment of DFS's impact on farmers.

To create the 'meaningful use' score, we conducted focus groups with farmers and consulted experts on how DFS delivers value. We then tested the score with 4,800 farmers using services from 18 DFS providers across Kenya, Nigeria, Ethiopia, Ghana, and India. Our findings confirmed that the 'meaningful use' metrics strongly correlate with perceived impacts of DFS, such as increased production, higher earnings, greater farm investment, improved product quality, and better access to reliable markets.

The MU score is based on multiple indicators to comprehensively measure value. We initially shortlisted the following indicators:

- Effectiveness of DFS in meeting farming needs (4-point scale)
- Convenience of accessing services through DFS (5-point scale)
- · Comfort with using digital tools due to DFS (5point scale)
- Likelihood of recommending DFS (11-point scale)
- Level of disappointment if DFS services are lost (3-point scale)
- Impact of DFS on the overall farming season (5-point scale)

Correlation tests:

To validate our MU module, we used correlation tests to examine how our indicators relate to various impact metrics and to each other. All indicators showed similar correlation levels with impact metrics: around 50-60% with changes in farming methods, produce quality, and production, and 40-50% with input access and quality. We found that the perceived impact of DFS on the overall farming season was strongly correlated with convenience, comfort, and level of disappointment.

Given the consistent correlation patterns, we narrowed our focus to three final variables for the score:

- DFS effectiveness in meeting farming needs
- Likelihood of recommending DFS
- Impact of DFS on the overall farming season

Additional Information

After completing lean data collection with farmers from 18 digital providers, Busara conducted a cognitive debrief with 40 farmers in Nigeria, Ethiopia, Kenya, and India. Cognitive debriefing is an interview process designed to uncover how participants interpret and experience specific concepts or tools, offering insights from their perspective. This debrief explored farmers' experiences with digital tools and gathered their views on the 'meaningfulness' of these interactions. The process involves several key steps:

- 1. Selecting a Representative Sample: Busara chose 40 farmers across multiple countries to ensure the debriefing reflected the larger survey population.
- 2. Designing Probing Questions: Specific follow-up questions were created to explore whether farmers found the survey questions clear, relevant, and easy to answer, and if they were comfortable with their responses.
- 3. Conducting In-Depth In-Person Interviews: Farmers were interviewed individually in person, with interviewers guiding them through each survey question and encouraging them to "think aloud" about how they interpreted and answered each one.
- 4. Using Probes to Identify Issues: Interviewers asked follow-up questions to reveal any areas of confusion, discomfort, or inclination toward socially desirable responses. Prompts included:
 - "What does this question mean to you?"
 - "How did you come up with your answer?"
 - "Was this question easy or hard to answer? Why?"
 - "Are you comfortable answering this auestion?"
 - These probes helped reveal any areas of confusion, discomfort, or inclination toward socially desirable responses.

- 1. Analyzing Challenging Questions: Interviewers noted any questions that caused difficulty, particularly those requiring recall or numeric responses. Open-ended numerical questions, like estimating production increases, were especially challenging for participants.
- 2. Refining the Survey: Based on the debrief findings, Busara revised the survey to improve clarity, removing or simplifying questions as needed. For example, open-ended numerical guestions were excluded due to the challenges reported.

The deep-dive into the cognitive debrief data focused on information DFS users, as they made up the largest proportion of farmers.

Overall, we found that farmers understood the questions well and could answer them easily, particularly when they were presented in a Likert or 0-10 scale format. The only questions that posed challenges were open-ended numerical ones, such as estimating the percentage increase in production due to DFS. As a result, these questions were omitted from the report.

Meaningful use metrics:

NPS (Net Promoter Score): Farmers who benefited from DFS often recommended it to fellow farmers, community members, and family, sharing practical insights on farming techniques, nutrition, and product usage. Feedback from those who acted on these recommendations was positive, with many reporting improved farming outcomes and satisfaction with the services.

Needs met: Farmers showed a clear understanding of this question and thoughtfully reflected on what additional support the service could have provided.

Impact on season: Farmers demonstrated a clear understanding of DFS's impact on their farming activities. Examples they provided included:

- Improved crop quality through access to pesticides and herbicides.
- The ability to produce maize twice a year with irrigation farming.
- Enhanced livestock practices through better sanitation and vaccination.
- Timely weather information that helped manage unexpected rain and protect crops.
- · Increased productivity through education on modern farming techniques.

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| I | recorde | d | my | bes | t | yie | ld y | et. | |
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About 60 Decibels

60 Decibels is a global, tech-enabled impact measurement company that brings speed and repeatability to social impact measurement and customer insights. We provide genuine benchmarks of impact performance, enabling organizations to understand impact relative to peers and set performance targets. We have a network of 1,400+ researchers in 80+ countries and have worked with more than 1,000 of the world's leading impact investors, companies, foundations, corporations, NGOs, and public sector organizations. 60 Decibels makes it easy to listen to the people who matter most.

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> good products

for farmers.



> That are easily accessible