



Exploring the business case for Digital Climate Advisory Services (DCAS)

India case study

Contents

Key takeaways

- Where farmers can access it, DCAS more often than not has a strong business case for them. **84% of the farmers surveyed as part of this study are using DCAS at least on a weekly basis, and 71% believe that DCAS is worth the time, effort and resources** invested in using it.
- However even in the current phase of the market, where much DCAS is subsidized by public, donor or upfront company investment, and **free or very low cost for a farmer, the business case is not overwhelming. Only 55% of the farmers surveyed expressed that DCAS are meeting their needs and expectations**, as many applications provide generalized broad advice that is not useful. There are also key aspects of DCAS where farmer adoption is low. **Only 5% of farmers explicitly stated that they use digital solutions for weather forecasting and just 16% use it to gain access to market information.**
- For companies, the business case is very strong in certain industry sectors, particularly inputs and technology, and to a lesser extent for producers, traders and food and beverage companies. For any company that relies on large-scale engagement with farmers to sell products or procure their produce, digital solutions are an obvious direction of travel.
- **But the need for tailored solutions across vast geographic areas presents a challenge to companies** - this requires heavy investment. Existing wide scale coverage of public-funded DCAS, means that companies have to go beyond the existing generic services to get the requisite engagement from farmers.
- Making these investments for companies is challenging when farmer and intermediary ability and **willingness to pay for these services remains very limited**. As one interview stated "Yes, there is a convincing business case. But at the end of the day, will the farmers pay for it? That is the million-dollar question."
- An optimal outcome is that farmer-centric, tailored solutions that are segmented by the specific crop or geography are being delivered to farming communities across the country at no/low-cost to the farmer, or paid for via effective intermediary models that make it affordable, and in line with company investment capacity. **But there is still far to go to reach this outcome.**
- To help reach it, we provide a set of recommendations for more effective public/private collaboration to **scale up tailored DCAS, investigating the potential of low-cost peer-to-peer delivery options, increasing high risk-tolerant donor/impact investments in farmer-centric models, and broader infrastructure investments.**
- We also identify the need for a DCAS **learning community of practice** and an **open-data sharing platform** where public and private actors can mutually benefit from the data that each hold.

① Background & context

India is one of the largest and fastest-growing markets for digital technologies, with 560 million Internet subscribers and 1.2 billion mobile phone subscriptions.¹ Increasingly there has been penetration of mobile phones into rural regions of India that has helped drive the development of **Digital Climate Advisory Services (DCAS)**.² DCAS refers to the **provision of climate-related advisories and services to farmers via digital tools and platforms. These include online portals, mobile applications, more traditional, digitally enabled services like radio and interactive voice response systems.**

The type of advisory can range from meteorological data and crop cycle alerts, to bundled services including access to inputs and good agricultural practices, market information, insurance, and finance. DCAS has experienced significant growth in India, where there are over 600 agri-tech start-ups that have emerged in the past five years.³

DCAS can help farmers and companies improve their productivity and resilience. **It is estimated that the widespread adoption of digital agriculture in India could increase yields by 15 to 20%, adding USD \$20-25 billion of economic value per year by 2025.**⁴

However, despite progress in rolling out digital services to rural areas and the potential benefits of DCAS, **smallholder farmer access to these services remains limited.** There have not been comparative studies of the active users of DCAS in India, but **69% of farming households in the country do not have access to the Internet** and would therefore be unable to access and use a large number of these services.⁵

This indicates that whilst the potential benefits of DCAS are clear, there is a pressing need to understand what aspects of the business case are already apparent for farmers and the companies they supply and buy from, and what gaps need to be addressed to enable adoption at greater scale.

This is a partner paper to the **'Digital Climate Advisory Services for sustainable and resilient agriculture in India'**, also developed by WBCSD, which provides a broader overview of DCAS in India and focuses on specific actions the business community and WBCSD members can take to maximize its potential for improving productivity and resilience for farmers.



② Methodology

From February to April 2021, WBCSD carried out targeted interviews with farmer organizations, research organizations and WBCSD India member companies to gain qualitative insights into their perceptions of the business case for DCAS.

A selection of these organizations were supplied with a set of survey questions to engage in a limited number of interviews with farmers they work with directly, to gain further qualitative insights and complementary quantitative data. It is important to note that with this survey size the results are not scientific in nature, but provide some helpful indications of how farmers are using DCAS in the groups sampled.⁶

Perspectives provided during the interview process are anonymized and aggregated into this study, supplemented by secondary research to help assess the realistic business case for DCAS in India.



③ Farmers' perspectives

Key benefits of DCAS

The subset of farmers surveyed in this study are using DCAS on a regular basis. **84% are using DCAS at least on a weekly basis**, or more frequently.

DCAS can benefit farmers in several ways. It can provide customized advice on what types of crops to grow, when to sow, the optimal quantity of inputs to use, and modern farming techniques. This helps to improve **farmer knowledge on new techniques and skills which helps to save time**. The majority of the farmers (61%) interviewed in this study are using DCAS for this **customized agronomic information**.

The increased knowledge and personalised advice **can help farmers increase profitability, yields and reduce the application of inputs used**.

A farmer surveyed indicated that DCAS "improves profitability, it improves yield, plus we can reduce the application of fertilizer and everything else."

Over two thirds of the farmers surveyed indicated that DCAS increases the profitability on the farm. This is backed up in the secondary research, where a 2019 survey of 1,105 households in eastern India demonstrated that using DCAS and broader digital advisory with farmers can increase farmer income from 25-29%, and productivity by 18%.⁷

71% of farmers surveyed believe that DCAS is worth the time, effort and money invested in using it. The true benefits from DCAS are likely even higher, as farmers who receive information via DCAS will occasionally share this with other farmers, creating additional benefits.⁸

It is not just customized agronomic information that is benefiting farmers, but increasingly **YouTube and WhatsApp** are being used by farmers to network and exchange information.

Just under half (45%) the farmers surveyed used alternative routes to access information such as WhatsApp. These platforms could serve as an entry point for farmers into more customized DCAS models as video-based advisory is found to be a cost-effective channel to improve farmer knowledge and practices.⁹ These applications can help to **raise the income of smallholder farmers and promote the empowerment of women**. For example, in Bihar, the majority of the goat farmers are women who manage less than half an acre of land. Through uploading and sharing images of their goats through these channels, the farmers were able to access a larger market and increase profits by 20-47%.¹⁰



Main challenges

Although the farmers in this study are using DCAS on a regular basis, **it is acknowledged that access and the ability to operate DCAS is still lacking** in some regions of India. Farmers might not use “the apps due to lack of interest/ knowledge/communication, even though they have access to a smartphone.” This reflects the fact that the adoption of digital solutions such as DCAS is often limited due to low levels of digital literacy, education and trust.¹¹

Farmers are receiving **a plethora of generalized messages which is reducing their trust in these applications**. These messages are coming from private sector, NGOs, public institutions and government which is “overloading farmers with lots of useless data”. This is a particularly pertinent challenge in India, where farmers have reported that they prefer to continue using current agricultural practices as opposed to adopting new practices, with 70% of farmers distrusting any extension advise.¹² Customized information requires two-way communication and farmers might be unwilling to provide accurate data to companies as they have a lack of trust.

Although, just **over half (55%) of the farmers expressed that the application is meeting their needs and expectations, many applications provided generalized, broad advice that is not useful to the farmer**.

Farmers expressed that they have “specific problems that we want the application to address”. This reflects the fact that the **majority of the farmers (84%) are receiving this advisory for free**, and a lot of digital models are yet to mature.

Linked to a lack of trust and customized advisory, the **farmers in this study are not using a singular application or service for DCAS, preferring to use multiple applications**. The farmers expressed that they “cannot rely only on the digital services and only on one single apps/ services. Therefore, they are using one or many apps for different agricultural purposes.” This could be due to the fact that many of these applications act as a standalone product, as opposed to providing an application that bundles several services together into once product.

Despite the fact that India is a region that has a diverse climatic variability which can directly influence when and where to grow certain crops, **only 5% of farmers proactively stated that they used the application for weather forecasting**. DCAS was more commonly used for access to agronomic information and markets. This would suggest, based on those involved in this study, that weather and climate data is not widely prioritized. Providing locally relevant weather and climate information in India is challenging due to a number of barriers including difficulties in predicting monsoons, in understanding seasonal climate forecasts, poor reach into remote areas, lack of time to incorporate forecasts into farmer decision-making, and the tendency for farmers to plan short-term cycles as opposed to longer term planning that is required.¹³

Only a small subset of farmers (16%) were using DCAS for market information on pricing and vendors to sell to. This could allow farmers to achieve a better price and have more negotiating power. One respondent exclaimed that a farmer could use DCAS to “directly contact prospective buyers, helping to increase market access”

④ Examples of DCAS

Example 1

[The Intelligent Agricultural Systems Advisory Tool \(ISAT\)](#), is delivering climate information to farmers at scale. It is a tool developed by ICRISAT and Microsoft that is capable of generating and disseminating data-driven location specific advisories that assist in farm level decision making. This tool was designed to better serve farmers and create stronger connections between value chain actors. Some key benefits related to ISAT include:

- More than 80% of farmers were satisfied with the frequency, relevance, and understandability of the messages delivered;
- 5,000 farmers in 10 districts of India have been receiving messages directly since 2016; and
- Indirectly, the information reaches another 40,000 farmers, resulting in an estimated 20% increase in groundnut and chickpea yield, contributing USD 225 a hectare to farmer income.¹⁴

ISAT also partnered with Kalgudi, a free online platform developed by Vasudhaika Software Solutions, India, for producers, traders, service providers, and others in the agriculture value chain. This provided a platform for ISAT to disseminate its weekly messages to a larger network of farmers. This platform is trusted by farmers as the advice is in local languages and provided by reputable sources. This helps to create a two-way communication and feedback loop between farmers and ISAT.

This application is currently free to farmers, but pilots are being explored with the private sector to innovate and scale out this application.

Example 2

UPL – Nurture Farm

In 2020, UPL created an AgTech platform called [nurture farm](#), which promotes itself as a farmer-centric business model. Nurture farm provides advisory services as well as bundling other services across the breadth of farm management into the application including insurance, rewards, weather forecasting and customer support.

Although this was only launched in the last year there have been clear benefits to farmers who have seen on-farm productivity increases up to 30% and the associated cost savings with optimal input usage, as well as UPL who have access to increased traceability, transparency and data.

⑤ Company perspectives

Key benefits of DCAS

Traditionally in India, the main method of diffusing agricultural knowledge and advisory is through public sector-supported extension services. However, the effectiveness and scale of these programs has been questioned.¹⁵ For instance, in India it is estimated that the ratio of extension workers to farm holdings is 1:1162, compared to the recommended 1:750.¹⁶ However, **DCAS can reach farmers at a scale not possible through face-to-face interaction alone.** “In a country like India the level of face-to-face interaction needed to scale effective agricultural advisory services is not possible. It cannot reach the scale required. This is why we are investing heavily in digital solutions.” These technologies can allow companies to reach farmers they would otherwise not reach and provide advisory to tens of thousands of farmers. Often this is done with a mixture of face-to-face interaction and digital applications.

For example, the e-Choupal model by ITC provides advisory and access to markets and has reached 4 million farmers, with plans to reach 10 million farmers by 2022.¹⁷

Companies are realizing the potential of DCAS, including enabling farmers in their supply chain to achieve higher productivity along with increasing the resilience and transparency of their supply chains. Benefits that were cited include increased supply chain security, reduced supply chain carbon emissions, increased outreach, a larger market share, more customers, supplementary and improved farmer data, and higher crop quality and consistency.

DCAS is a useful tool to help companies **build relationships and trust with farmers through focused advisory.** Through these applications “farmers feel connected and can directly raise complaints, it is a two-way communication. This helps to build relationships.”

Digital tools such as Plantix and Kalgudi are creating these two-way information flows between researchers and farmers.¹⁸ This can help to establish mutually beneficial relationships between companies and farmers and increase transparency.

DCAS is helping to **make ‘last-mile’ engagement more cost effective.** This can even be achieved through simple messaging services. For example, one interviewee reported that “60 farmers have engaged in an intercrop and rotational crop program (encouraging climate-smart, high-nutrition crops alongside cash crops). A WhatsApp group was set up where they share stories and engage with the scientists on the program, which was very successful”. DCAS has proven useful for connecting farmers during COVID as traditional extension was suspended, for example Bayer has partnered with AgroStar on an e-commerce platform in India, enabling Bayer to provide seeds and crop protection products for multiple crops directly to 15,000 farmers’ doorsteps.¹⁹



Main challenges

The geographical and climatic diversity in India is a major challenge when trying to develop DCAS that is customized to farmers' needs. "India is a very diverse country in terms of climate and different geographies. One advisory service will not work for all farmers". There are many variables to be considered when designing effective DCAS in India including climate data, natural disasters (flood, cyclone, drought, etc.), local language, the water availability, poverty levels, size of landholding, access to market etc. The amount of time and resources needed to achieve this level of tailoring is a major challenge, though technology and design improvements can help reduce costs over time.

As showcased by the farmer surveys, very few farmers are currently paying for DCAS. **The farmers and farmer organizations' willingness to pay is key to the long-term sustainability of these applications.** As pointed out from a company response "Yes, there is a convincing business case. But at the end of the day, will the farmers pay for it? That is the million-dollar question?"

The DCAS business models presented by companies are still at a nascent stage. Consequently, companies **were only able to provide limited quantifiable data related to the benefits of DCAS at this stage.** It is difficult for companies to demonstrate the business case of DCAS on their own and often they will rely on others to be able to provide some of this data. However, the e-Choupal business model which has been established for a number of years, has an average return on investment of 32.3% per year.²⁰

The Indian Government plays a strong role in digital agriculture in India. For example, it has set up the Electronic National Agriculture Market (eNAM) which is available in 585 markets in 16 states, which also provides advisory through its mKisan SMS portal. However, it was reported by companies that **generalized advisory to farmers, typically provided by public institutions mean it is difficult for companies to show the business case and build trust with farmers.** "Typically, it is public intuitions that disseminate this advice, but they do not have the capacity to provide localized information and tend to use simplistic SMS messages."

Public institutions might struggle to create the customized DCAS required, as often the information might not be catered to communicate with the average farmer.²¹

It was also acknowledged that there is risk of **DCAS exacerbating the existing wealth and gender divide between farmers in India.** This divide could come from those that have access to smartphones and the resources to act on the advice they are given. This could have an impact on marginalized groups in India, for example women are less likely to own a smartphone than men.²²

Whilst this issue is already well-documented, it should be reiterated that despite significant progress in India, there is still a **lack of reliable mobile coverage in rural areas, which continues to hold DCAS back.** "Farmers need to be covered by the network in order to receive advice. There is a pressing need for improved mobile coverage in India." Internet access remains low in rural India, where only 31% of farming households have access.²³ With a lack of mobile and Internet access, it is difficult for companies and farmers to utilize the benefits of DCAS.

⑥ Recommendations

Based on this study, **it is clear that there is a business case for DCAS in India**, both from a farmer and company perspective. But there is still a way to go with developing these DCAS models and their business case to reach the scale and impact required. Recommendations for where the business community and public sector, donor and impact investment community can work together to overcome the challenges outlined in this study include:

1. More effective public/private collaboration to leverage the respective strengths of each.

The Government has a large and well-established reach through its existing programmes. These programmes should be further developed to move beyond generalized advisories to geographically and socially tailored DCAS. A multitude of private DCAS providers in the country have experience of delivering highly effective farmer centric and tailored services, but don't have the resources to scale these models without

compromising on quality. If these public programmes can work effectively with the private sector to combine quantity and quality, farmers across the country will benefit.

2. Investigating the potential of low-cost peer-to-peer delivery options in combination with more sophisticated digital applications.

Many companies in this study reported that the first point of call for farmers they engage with for advisory services is WhatsApp groups and other mainstream platforms, where information is shared by peers and lead farmers. The reach of high quality app-based advice can be amplified quickly when it is communicated via social media groups by lead farmers. Currently this largely happens informally, but if DCAS developers and companies can more formally integrate these peer-to-peer

models in their advisory services to farmer groups and intermediaries, they may still be able to meet their commercial objectives whilst reaching many more farmers than business as usual.

3. The donor and impact investor community can support innovative farmer-centric models to refine their models ready for scaling.

We found a range of effective farmer-centric and tailored DCAS models at pilot or early-stage development across the country. Many of these models require more risk tolerant and longer tenor finance to help transition from pilot schemes to achieving wider coverage. This will aid the development of multiple DCAS models in India that are focused and segmented to specific crops and geographies, helping to address the customization, language and cultural barriers.

4. **Investing in the wider infrastructure and ecosystem for DCAS in India.** This could include investments into weather sensors in different regions to capture localized weather data, wider infrastructural investments to increase mobile and Internet access, exploring the use of mobile communication networks to observe rainfall patterns and creating platforms for farmers and companies to engage. This will allow DCAS to be locally adapted to use and benefit farmers. Improvements in supporting infrastructure can also reduce costs, enabling DCAS delivery that is more accessible to farmers.

5. **Facilitating collaboration and data-sharing between different actors.** Many common challenges were identified by the range of stakeholders interviewed for this study, which go beyond any individual organization's power to address. The time is ripe for establishing a learning community of practice to help foster collaboration and coordinate on pre-competitive shared challenges.

There also appears to be a specific need to facilitate an open-data sharing platform where public and private actors can both benefit significantly from the data that each hold. Also see the data-sharing recommendation in the partner paper to this study "**Digital advisory Services for sustainable and resilient agriculture in India**". More work is needed to explore further some of the key issues related to data-sharing including data ownership, data rights, data privacy and data security.



Endnotes

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