



# Digital Climate Advisory Services for sustainable and resilient agriculture in India

Knowledge paper from the work of  
WBCSD's Farm of the Future in India

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# ① Introduction

**Agriculture and its allied sectors make the lifeline of the Indian economy by contributing to 17.8% of the country's Gross Value Add (2019-2020, at current prices). The sectors provide livelihood to over half the workforce in India and contribute to the food security of the country and the world. India is a major producer of milk, fruits, vegetables and staples, and exports large quantities of these products, dairy and livestock.**

Some of the challenges that the Indian agricultural sector faces are cross-linked, and cut across the climate, nature, food and social systems.

- Close to 80% of the Indian farmers are smallholders who have low purchasing power and face issues such as low credit access and price volatility leading to low farm profitability.
- About 70% of the net sown area in India is rainfed and is highly impacted by variability in weather conditions due to climate change and water stress.

- Inadequate and lack of timely access to extension services, and unavailability of sufficient cold storage leads to food loss on the field. Upto 16% of the fruits and vegetables produced in India are lost on the field.
- Government policies on agriculture, such as farm-loan waivers, subsidies on water and power, free market laws often lead to policies such as subsidies on water and power for agriculture may lead to unsustainable farm practices such as overuse of water and power.
- Digital illiteracy and inequality mean that marginalized sections of the farmer community do not get their fair share of value from agriculture.
- Companies in the food and agriculture sector and financial institutions to ensure delivery of high-quality products and services, improve information flow and address market inefficiencies.
- Governments in ensuring access to their programs and policies as well as monitoring of their implementation efforts.
- NGOs and implementation partners to ensure the reach of localized solutions for farm management and livelihood improvement.

This paper examines the role of Digital Climate Advisory Services (DCAS) in Sustainable Agriculture in India. It highlights the demand and supply-side issues in DCAS and explores the role of businesses in particular in scaling the use of DCAS to promote sustainable and resilient agriculture in India. This paper has been developed through collating inputs and insights from the WBCSD member companies active in the food and agriculture sector in India.

In the last decade or so, digital solutions have gained significance in addressing some of the above issues in agriculture in India. In particular, digital solutions have helped.

- Farmers get access to timely and useful information to manage farms and sale of their produce better.

## ② Digital Climate Advisory Services (DCAS) and the value proposition

DCAS refer 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.

A typical DCAS delivery model is outlined in the figure below.

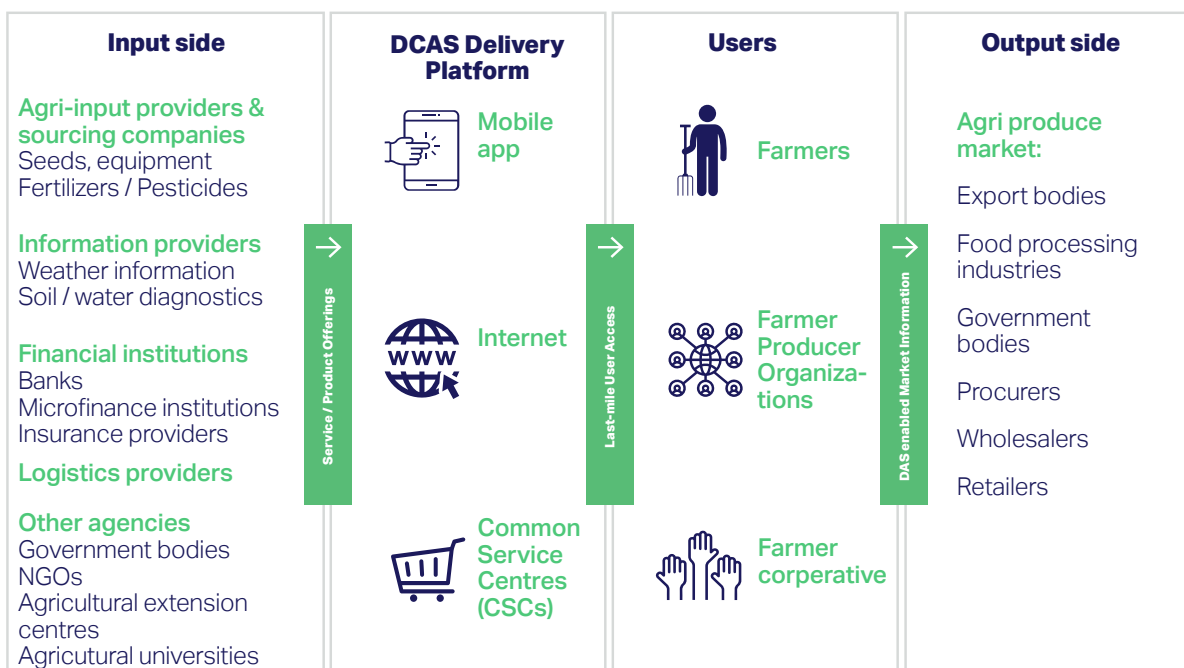
A DCAS delivery model involves different stakeholders that are directly or indirectly involved in the provision of advisory to farmers. Data providers, technology developers, NGOs who ensure outreach and delivery are often directly involved. Also critical is the role of financiers of advisory solutions such as governments, or businesses. Digital advisory services are often bundled with sale of farm products and services including credit and insurance by companies. Bundling is a way to ensure farmers receive the inputs and services they need along with farm advisory, and for companies it is a way to ensure their investments are in line with their business goals.

In theory, a successful DCAS model delivers value for:

1. **The farmer** – in ensuring better adaptation to climate related variabilities including weather changes and pest attacks; improved farm profitability and returns through better farm management and sale of produce.
2. **Climate** – Better farm management can reduce or lead to a net capture of greenhouse gas emissions.
3. **Nature** – in ensuring farmers practice low impact agriculture.

A successful DCAS delivery model is one that keeps the farmer at the center, and ensures the model delivers value to all stakeholders involved.

Figure 1: A typical DCAS delivery model





## Moo Farm on farmer-centric advisory model

An award-winning start-up called Moo Farm offers dairy farmers in India with a range of services to meet all their cattle-rearing needs through an innovative application. Farmers can network with fellow farmers on frequently asked questions, schedule a veterinarian consultation, get access to an e-marketplace for cattle trade, and get access to dairy farming inputs as well as credit. Generalized services like networking come free, while high-value personalized services come at a payment of a fee. A robust application ensures farmers get the services immediately and have a good user-experience.



The farmer interactions with the application are constantly monitored and the application is adjusted to ensure it is easy to use. The application has been a big hit among farmers in North India and Maharashtra and has ensured encouraging cost savings for them. The company has a mission of touching the lives of 100 million dairy farmers in the country and making them prosperous.

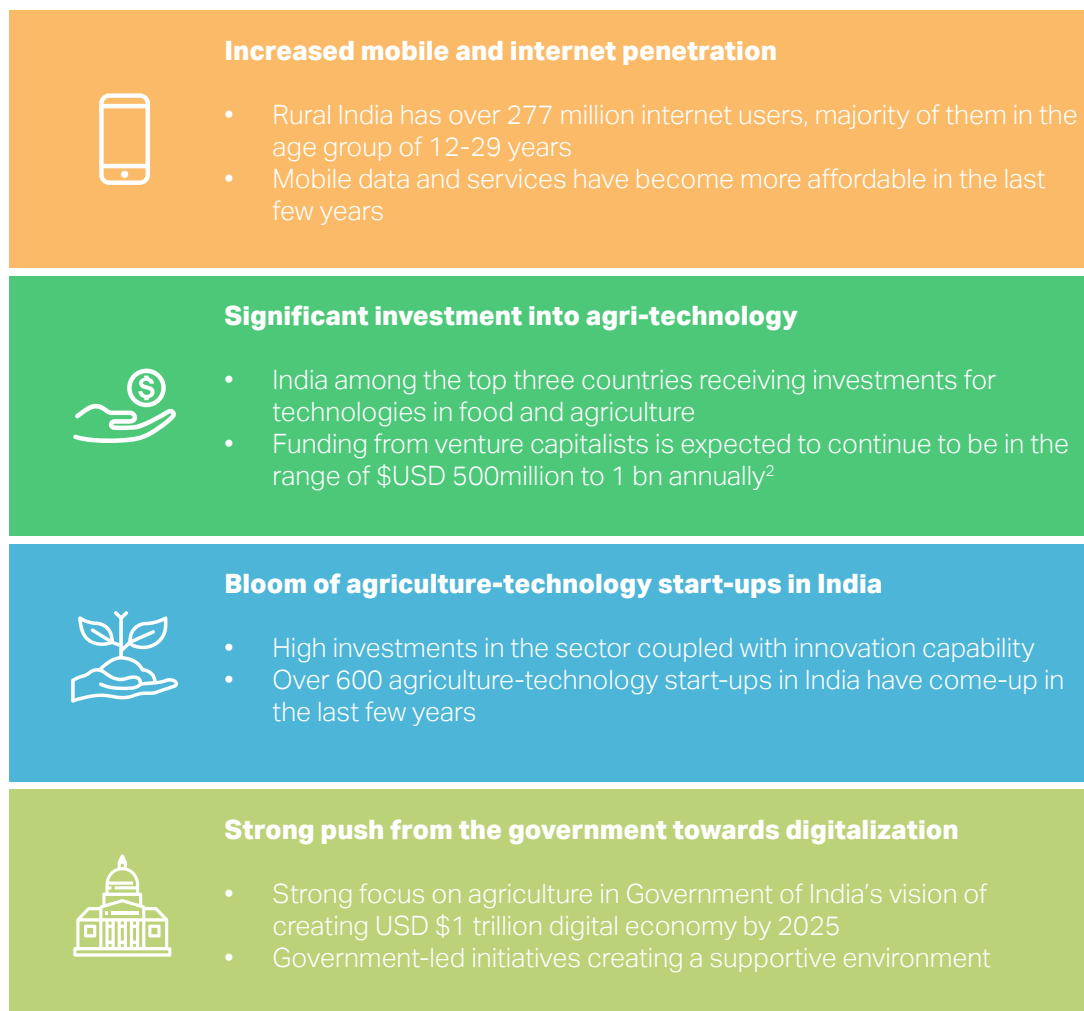
Figure 2: Stakeholder priority mapping in relation to DCAS



## ③ Key enablers

Digital technology solutions including DCAS for farmers have seen a significant rise in India over the last decade. Key supply-side drivers have ensured a wide range of farmer advisory and service applications are available. The richness of offerings, in particular through means of bundling has increased the demand for advisory services as well. There is better demand for a complete suite of services including credit access, post-harvest extension support relative to standalone advisory services. Network effect has played a role in faster adoption of DCAS among farmers in India.

**Figure 3:** Key supply-side drivers for DCAS in India



## BOX 1

### Key initiatives of the central government that support digital advisory

A recently announced initiative called AgriSTACK aims to build a database of farmers in the country, which would be crucial to delivery of services of the agri-technology companies. Digitalization of land records under this initiative will help in providing agri-finance.

Agri Udaan, a food and agribusiness accelerator organized by a coalition of various government departments is supporting agribusiness start-ups through rigorous mentoring, industry networking and investor pitching.

## BOX 2

### Initiatives of state governments on digital advisory

Realizing the potential of integration of digital technologies in the agricultural value chain, many state governments are in the process of creating relevant policy frameworks and implementing innovative programs. In 2020, Telangana had launched the Artificial Intelligence for Agricultural Innovation (AI4AI) program in association with the Centre for the Fourth Industrial Revolution, India, World Economic Forum.

It aims to scale-up the use of predictive insights to issue advisories on sowing, use of inputs, pest incidence, and harvest; & support farm mechanization, disbursement of subsidies, and procurement.



# ④ Key barriers to scaling-up of DCAS in India

While the ecosystem for DCAS in India is supportive, there are gaps in demand and delivery that have kept the advisory services from reaching their full potential. It is estimated that the agri-technology market in India has a potential of over USD \$24 billion in comparison to the current realized market size of around USD \$204 million, indicating a less than 1% capitalization.<sup>1</sup> DCAS links to most segments of this cumulative market, including farm-input and output market segment as well as farm management and traceability segments, and therefore the potential to expand is significant.

Some key barriers noted on the demand and delivery side for DCAS in India are:

## 1. Lack of a clear business case

This issue is explored in depth through a detailed case study “Exploring the business case for DCAS in India” published as a complementary report to this knowledge paper. You can find the key messages on the next page. Farmers often highlight that they receive a lot of broad generalized advisory that has limited value for application in relation to the specific nature of issues they face at the farm level. Several farmers use multiple agricultural advisory applications aiming to serve

their different needs for advisory, inputs and services indicating that most solution offerings are still standalone applications that do not offer the typical stack, or suite of solutions demanded by farmers. A lack of clear business case coupled with low paying capacity of smallholder farmers leads to a lack of willingness to pay for advisory services. On the supply side, the nature of certain elements of advisory, in particular weather-based advisory linking to availability of water, pest/disease attacks are very local and unpredictable and provision of specific and timely information on these issues is extremely challenging.

## 2. Demographics

The Indian farming community represents a complex and diverse stakeholder group with varying interests and abilities to take up DCAS. Older farmers are often hesitant to adopt digital technologies, small and marginalized farmers may not have access to mobile phones and Internet, and gender divide may keep women farmers away from using DCAS for farm management.

## 3. Digital illiteracy

While encouraging numbers of penetration of mobile phones and internet exist in India, there is a major gap in terms of the digital literacy of the farmer community, such as due to inability to operate mobile phones, lack of awareness of digital technologies. Lack of sustained use of digital advisory applications is also an issue widely reported. Businesses, or NGOs, often need to invest efforts in creating awareness on the potential and value of DCAS. Last-mile physical contact with farmers is also often required to complement the digital interface that the applications provide.

## 4. Trust

So far, India has not seen an expansive, collaborative effort between the government, the private sector, the development partners and farmers to drive farm productivity and farmer incomes. There is a lack of trust among the various stakeholders and in particular, related to the role of the private sector in improving farmer livelihoods and farm profitability. DCAS as a solution area that depends on a close collaboration between the various sectors therefore remains to be utilized to its full potential.



## ⑤ Deep-Dive: Business case for DCAS in India

As both farmers and companies often seem to miss a clear business case to invest in DCAS, WBCSD and Terranomics published a report that further explored the business case for DCAS in India. The key messages of the report include:

- 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.

# ⑥ Recommendations for businesses

Over 90% of the market linked to bundled services is private sector market, so businesses can play a key role in creating incentives for and scaling the adoption of DCAS in India.

## 1. Corporate investments and handholding

Businesses should invest in agri-technology companies and agri-fintech companies while providing them a conducive environment for innovation to serve the advisory needs of farmers in a targeted way. Often agri-technology companies are led by technical experts, and the solutions developed by these companies need to be tested to the realities on the ground. Businesses should open their supply chains for experiments and to test innovations. Businesses also understand the agricultural markets, and supply chains and can provide mentorship to technology companies to help develop customized solutions for advisory.

## 2. More effective collaboration

Overcoming the lack of trust is key to ensuring effective collaboration between the different stakeholders involved in DCAS provision and delivery. Businesses can demonstrate value creation through innovation both in the design of DCAS applications as well as in their delivery. The delivery models for DCAS in India need to create incentives for farmers so they encourage adoption. The delivery models also need to ensure that small and marginalized sections of the farmer community are not left out. As referred in the case study “Exploring the business case for DCAS in India”, DCAS solutions developed by businesses can be delivered through government-led programs to combine both quality and quantity in delivery of DCAS services to farmers in India. Businesses can also win the trust of other stakeholders by showcasing their success stories.

DCAS represents a typical example of a service that can demonstrate a partnership-based approach in agriculture in India. It can drive the much-needed shift from transaction-based agriculture to partnership-based agriculture that leads to risk-sharing among different agriculture stakeholders and can ultimately improve farm-profitability.

Given the size of the country, and the specific nature of certain advisory elements such as weather-based advisory, segmented approach to advisory based on commodities or geographies may help deliver targeted solutions and lead to better adoption of DCAS in India.

### **3. Data sharing and more effective use of available data**

Agriculture data is collected by different stakeholders in India for their individual purposes. Most data are unavailable in the public domain and therefore is under-utilized for collaborative purposes. Data has an immense potential of opening up opportunities for investment and driving innovation and collaboration in the agriculture sector. Businesses in India should demonstrate leadership in this area by developing an open, shared data framework and its related principles to aggregate various agriculture-data sources.

This will define the first step towards creating an environment that enables data sharing and innovation. Further collaborative efforts between the different stakeholders including the government, businesses, NGOs, other data providers can lead to the creation of a common data platform with established principles and ensuring access to all. As best practice, data sharing should enable all stakeholders to create and derive value, it should be inclusive and ethical, and should incorporate privacy and security considerations by design.

### **4. Role of SMEs and grassroots institutions and adopting an inclusive approach**

While customized advisory is important, it is equally important to ensure effective modes of delivery of the advice. Effective delivery of advisory is possible only through the last mile contact that grassroots institutions and SMEs provide to the farmer communities. These organizations also often understand the local and cultural context, help in bridging gaps such as socio-economic and gender divide among farmer communities, and help build trust in the system. Businesses should embrace the role of these institutions and adopt an inclusive approach by investing in and partnering with them.

## Endnotes

- <sup>1</sup> Madan, A. et al (August 2020). Agritech - towards transforming Indian Agriculture. Ernst & Young LLP. Retrieved from; [https://assets.ey.com/content/dam/ey-sites/ey-com/en\\_in/topics/start-ups/2020/09/ey-agritech-towards-transforming-indian-agriculture.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/en_in/topics/start-ups/2020/09/ey-agritech-towards-transforming-indian-agriculture.pdf)
- <sup>2</sup> Mathur. H, (2021, January 10). A 10-point policy prescription to make Indian agritech accessible to farmers . Retrieved from <https://yourstory.com/2021/01/policy-push-indian-agritech-startups-investment>



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Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD \$8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within planetary boundaries, by 2050. [www.wbcsd.org](http://www.wbcsd.org)

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