

Accel

—  
POST COVID

# AGRITECH LANDSCAPE



A COMPREHENSIVE REVIEW

# Foreword

COVID-19 has been a terrible human tragedy, but also a catalyst for rapid social change. Trends that grew steadily over two decades, including e-commerce, WFH, and food delivery, suddenly surged into ubiquity as lockdowns commenced across the globe. The situation in India has been similar, albeit further complicated by poverty and weak public health systems.

India's lockdown, which began on 24th March 2020, had the unintended consequence of accelerating the country's up-and-coming agritech ecosystem. In the last four years, agritech startups in India witnessed unprecedented growth alongside rising interest from the VC investor community. Leveraging 4G connectivity and rising smartphone penetration, agritech entrepreneurs built farmer platforms, B2B agri marketplaces, rural fintech businesses, and farm-to-consumer (F2C) brands. But this dynamic ecosystem represented only a small part of Indian agriculture and reached less than 20% of Indian farmers.

The disruptions caused by COVID and India's strict pandemic lockdown shattered the status quo for 130 million farmers as well as millions of agricultural traders and SMEs. Existing supply chains froze, staggered, and only slowly reopened. Farmers found themselves struggling to purchase inputs, access finance, and find markets for their crops. Unable to conduct business for weeks on end, agricultural traders and SMEs were worse hit. Agritech startups, which for years had co-existed with the traditional ecosystem, suddenly discovered that they were essential. Ultimately, the pandemic helped catalyze a shift across the agricultural economy, away from traditional, informal, and analog markets towards innovative, formal, and digital ones.

This report, jointly authored by Accel and Omnivore, is an attempt to illuminate the transformations underway in Indian agritech. We hope you come away from it with a renewed sense of optimism regarding the path ahead for Indian agritech.



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# New Bharat: Youth and Agri-Startups

## Lessons from COVID-19

COVID-19 has consumed the world since October 2019, and India came to feel its cruel impact from February 2020. With the onslaught of the virus, every aspect of the country's life, including social and economic, faced unprecedented challenges. The society had no option but to lock itself in, not just metaphorically but literally. In the history of the world, man when faced with such a contingency, has had no choice but to respond with innovations. After all, one is left with a Hobson's choice for the survival and sustenance of society. The options that the pandemic offered were shut out the self or shut down the economy.

Of the three major segments of the economy, agriculture - the primary economic activity, posed tough challenges. The Rabi crops were ready for harvest and could not be ignored. The nation's food security, and the farmers' economic stability were at stake. The period of Feb-March assumed greater sensitivity, for it was time for Zaid (March-June) or summer cultivation, followed by preparations for the all-important Kharif (June-July) season.

With these critical factors at play, despite the pandemic, the Government had to let the farmers harvest their Rabi crops, and prepare for the following seasons. While working on farms was a distributed activity, marketing required congregation at the marketplaces. This was contrary to what doctors were strongly advising – maintaining social distancing. The solution to market agri-produce without travelling to aggregation platforms was found in online trade, and/or solutions minimizing the need to travel for transaction.

The rules of the state APMCs, that mandated transaction of produce on the market premises, were suspended as an interim arrangement, and sale anywhere either as individuals or as FPOs was facilitated. This logically led to opt for online trade, and not just physical transactions as had been the norm. The disrupted supply chains had to be reinstated with minimum loss of time and impact on farmers' purses. A number of innovative business models began to fill the space on both the input, and output side. Many of these revenue models were built on the power of digital technology.

## Pilot to Universalism

The ongoing crisis triggered new practices in managing the supply chains at pilot scale. Even the Government thought it proper to adopt the same as new norms of doing business at universal scale. This has resulted in what is now popularly known as Atma Nirbhar Bharat – Agriculture<sup>1</sup>. It comprises a new policy basket that liberalises agricultural trade, opts for aggregation platforms and farmers mobilisation, and aims at strengthening of agri-logistics. The new Farm Laws that effect a paradigm shift to marketing of agricultural produce include, i) The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance 2020<sup>2</sup>; and ii) The Essential Commodities (Amendment) Ordinance, 2020<sup>3</sup>.

There now exists a renewed scope for seamless direct trade between the farmers and agri-stakeholders such as traders, processors, and exporters. The supply chains will be enriched with new class of purchasers and disintermediation. Supported by deregulation of food items from the cap on stock and store under the amended EC Act, connecting marketable surpluses from the production zones to the consumption zones will get smoother and more efficient, resulting in competitive price discovery.

## Aggregation Platforms

While enabling free trade is a necessary condition, for the farmers, and in particular the small and marginal farmers to be active participants they need capacity building. The reform package responds to this need by committing to mobilisation of 10,000 FPOs, 22,000 number of Gramin Agricultural markets (GrAMs) and contract farming via The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Act, 2020<sup>4</sup>. These initiatives will help improve operational efficiency throughout the value chain.

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1. Atma Nirbhar Bharat allows intra-state and inter-state trade of farmers' produce beyond the physical premises of APMC markets.

2. The Farmers Agreement Ordinance creates a framework for contract farming through an agreement between a farmer and a buyer prior to the production or rearing of any farm produce.

3. The Essential Commodities (Amendment) Ordinance, 2020 allows the central government to regulate the supply of certain food items only under extraordinary circumstances (such as war and famine).

4. The Farmers' Produce Trade and Commerce (Promotion and Facilitation) Ordinance, 2020 allows intra-state and inter-state trade of farmers' produce beyond the physical premises of APMC markets. State governments are prohibited from levying any market fee, cess or levy outside APMC areas.

## Open Field to the Tech Start-ups

With the feasibility now available for building robust domestic and global supply chains, ensuring efficiency at every stage of the agricultural value chain becomes critical. This entails achieving higher productivity, minimising food loss, and conveying the surpluses to the demand centres over long distances in as fresh a way as possible. This is where the technology package comprising – both mechanical and digital components will have a great role to play. The new demand is to build technologies at pre- production, production and post-production stages of the life cycle.

Different inputs including water, fertilizers, labour and capital have to be used rationally. Risks that include biotic (pests and diseases) and abiotic stresses (rainfall, temperature etc.) at production stage; and price and demand fluctuations at post- production stages will need to be predicted in advance, to enable the farmers respond suitably and minimise production and income losses.

The startups can avail a large number of existing technologies with the ICAR institutions, state agriculture universities, and laboratories in the private sector. The aspiring entrepreneurs will need to wear their innovative hats and roll out technologies in consonance with location-specific demands.

The traditional technologies will need to be made efficient and effective for sharing solutions with speed and in real time over space and time. This is where the power of emerging technology comes in. The power of data analytics, applications, Internet of Things, machine learning, artificial intelligence, sensors, and drones will be relevant.

The mass of data that is available with different government agencies at both central and state levels, besides with agencies under them can be used only when it is standardised, and data bases are connected by cross-DB intelligence. The technology architecture will therefore need to be inter-operable, and accessible. The government is beginning to appreciate the fact that data needs to be made available to the private sector for them to find it possible to build applications and offer services to the farmers. One can possibly expect data democratisation or monetisation (at reasonable cost), which then can be used by startups to improve planning and marketing effectiveness.

Today, the nation needs productive jobs for its teeming youth. Simultaneously, the society is looking up to the young and educated to become job creators, and not job seekers. New policies that offer training and skilling programmes, credit at reasonable rates of interest, credit-linked-backend subsidy, and technology incubation centres should generate enough confidence among the youth to step into enterprise.

There are more than 300 registered incubation centres under both public and private sectors. In the agriculture domain too, large number of Agricultural Incubation Centres exist and more are under establishment. With growing agricultural produce and focus on agri-processing (food and non-food), the opportunity for startups is immense. To encourage more Indians to set out on their startup journey there are many enabling factors today. To name a few we have, Stand-up India, Startup India, MUDRA, the recent financial package along with reforms brought into MSME sector, and INR 10,000 Crores assigned for upgrading the technology of the existing 200,000 micro-food enterprises. The youth can now set up their startups with confidence, work towards scaling up, and aim to become unicorns, making India proud.



Shri Ashok Dalwai

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Chairman, DFI, Empowered Body  
Ministry of Agriculture and FW, Govt. of India

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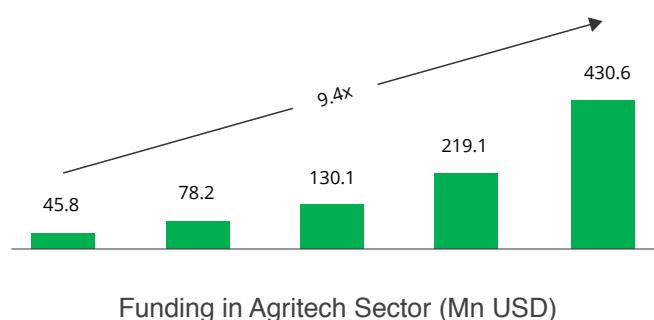
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# Introduction

In recent years, agritech has emerged as one of the hottest new sectors in India's fast-growing startup ecosystem. As founders and investors begin to look beyond the first 50 million consumers, agriculture as a sector presents significant opportunities for technology-first companies to disrupt traditional models. The past five years have witnessed a strong surge in the development of this ecosystem, with a 9X increase in institutional funding in the sector during this period.



The onset of COVID-19 in early 2020 in India disrupted industries, with several SMBs and startups bearing the brunt. The restrictions imposed on logistics, the shutting down of traditional retail channels, and the sharp drop in demand, led to an unprecedented slowdown for many companies. The agritech sector though has proved to be surprisingly resilient. Strong tailwinds formed by restricted movement, migration of labour, and increased consumer awareness of health, have helped escalate the adoption of technology throughout the farming ecosystem. Moreover, the classification of agricultural products as essential commodities ensured business continuity for most players during the lockdown.

A survey of 67 agritech companies revealed a considerable increase in demand for most players across the value chain during the lockdown with several of them expecting to see positive sales growth for the year.



of the surveyed companies witnessed a spike in demand during the lockdown period

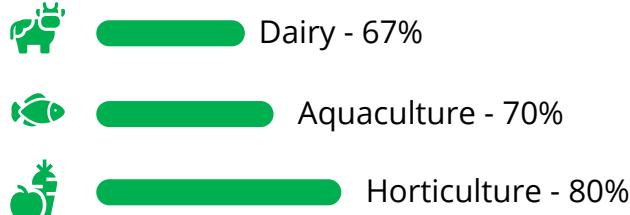


Companies expect to experience more than 50% growth over the last financial year

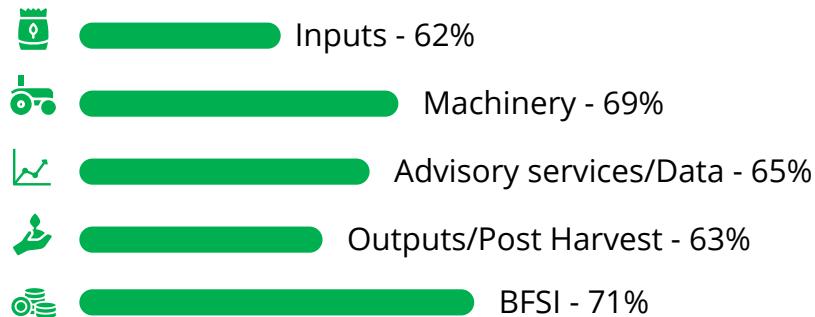
The rise in demand is consistent across industries and throughout the supply chain as is clearly seen in Exhibit A.

#### Exhibit A : Growth Estimates in the Agritech Sector

% of survey respondents that expected a positive revenue growth over the last financial year



% of survey respondents that expected >20% revenue growth over the last financial year



The increase in demand translates to optimism around fundraising as well, with 60% of respondents confident about seeing a surge in investment activity in the sector in the next 6-12 months.



of the respondents feel they will see active investment activity in the sector in the next 6-12 months



of the respondents are optimistic that the sector will be back to pre-COVID levels within 2-3 months

At the same time, while most companies are bullish on demand, fulfilling the increasing inbound leads has proved to be difficult for a number of companies due to various challenges, especially around logistics.

## Exhibit B : Impediments to serving demand

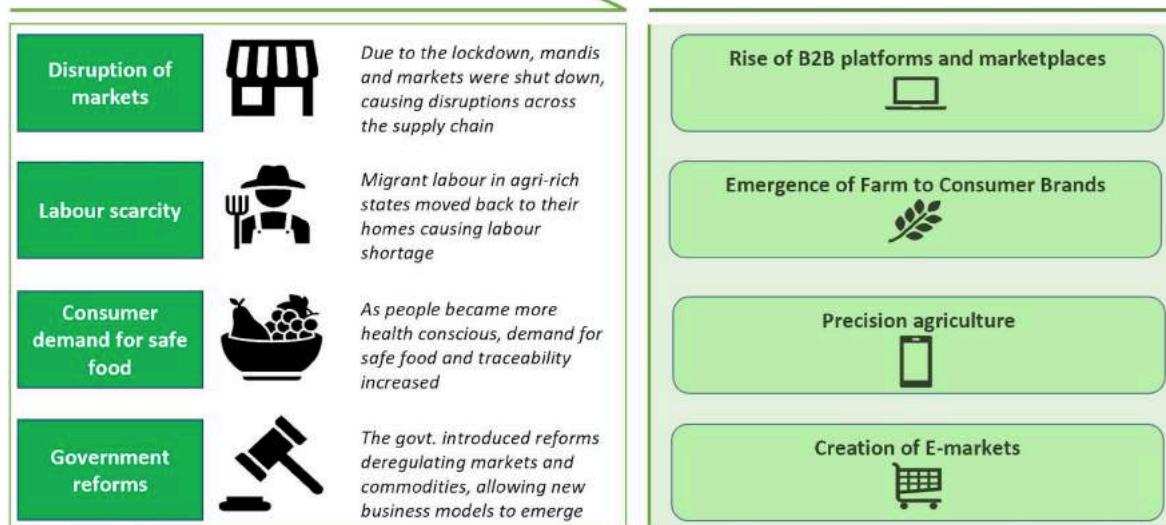


We expect the strong momentum that the agritech sector is witnessing to sustain in the next 12 months, as the demand for reliable food supply and quality produce increases. We believe the rapidly maturing sector and the entry of more entrepreneurs will create a fertile ground for innovative strategic plays as a direct result of the COVID-19 induced lockdown and disruptions. The next sections will cover the tailwinds driving the sector's growth and the key themes that we see emerging in the space.

# Emerging trends

The pandemic caused disruptions across the agri-supply chain, including closing of markets, breakdown of procurement, and halt in several on-ground operations. The pandemic also caused many migrants to move back to their homes leading to skewed labor availability. In the same time period, the government announced far-reaching reforms. All of these have contributed to new business models gaining importance in the agritech landscape. Four of these are summarized in the exhibit below:

Exhibit C : Tailwinds and trends



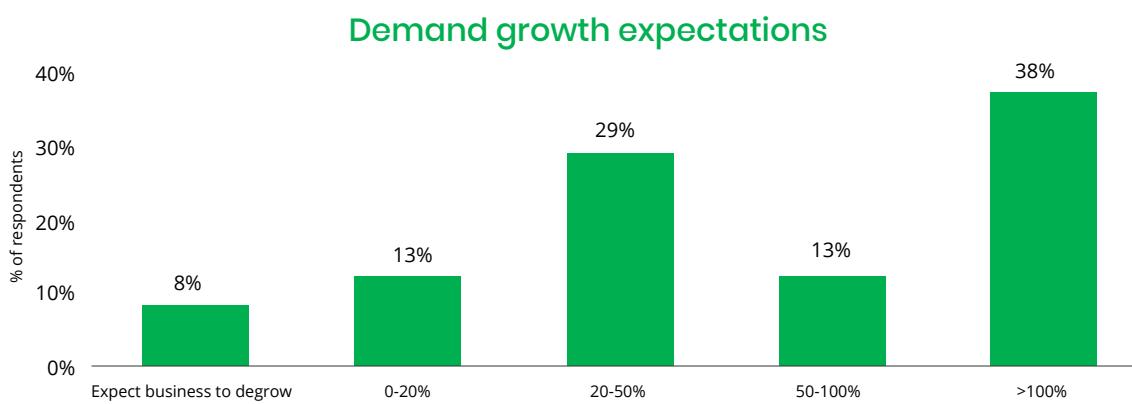
- Rise of B2B platforms and farmer marketplaces – Digital platforms have seamlessly connected various stakeholders in the supply chain.
- Emergence of Farm to Consumer Brands (F2C) – Rising health awareness has led to demand for safe and traceable food products. This could potentially lead to creation of vertically integrated farm to consumer brands.
- Adoption of precision agriculture – The rising penetration of smartphones has made farmers more comfortable using precision agri-technology. The onset of COVID has driven adoption as on-ground manual support reduced.
- Creation of E-Markets – The new government reforms coupled with the disruption of market linkages due to the pandemic has accelerated the creation of inter-state e-markets involving farmers, traders and buyers. We could see the emergence of several startups providing services for enabling this transition.

# Rise of B2B Platforms and Farmer Marketplaces

The rise of Flipkart and Amazon have ensured that digital marketplaces are now a mainstay for consumers in urban areas. Less visible but equally vibrant are the B2B marketplaces that are thriving in multiple industries. As a natural extension to the next billion consumers who are coming online, the agritech sector had also begun to see the creation of such platforms much before COVID-19 with established players like Ninjacart, Agrostar and DeHaat rapidly achieving significant scale.

However, in the pre-pandemic period, most platforms were relying heavily on a hybrid model of customer acquisition and service delivery, as most members of the supply chain (farmers to retailers) were not fully comfortable with web/app based ordering and product consumption. While smartphone and data penetration have risen sharply in rural India, especially after the advent of low-cost data solutions in the country, a significant portion of agri-companies continued to rely on call centre-based solutions for acquiring customers and for providing both advisory services and commerce facilities.

The country going into lockdown due to COVID-19 threw most call centre operations into chaos, with traditional supply chains being completely disrupted. The lack of traditional options, coupled with the absence of call-based solutions, has given a significant boost to the adoption of digital solutions among all stakeholders in the value chain. Case in point, farmers' requirement for inputs and agronomy advice and procurement needs of retailers and agribusinesses have created a sharp uptick in demand for agritech platforms during this period. A poll of 24 agri marketplace companies showed that 80% of them are projecting at least a 20% increase in revenue for the financial year 20-21 compared to 19-20.



While things have begun to return to normal since the lockdown has lifted, these platforms continue to see high engagement as users discover the benefit of migrating to digital media for day-to-day business operations. In the following pages, we examine four case studies on building traction on platforms across sectors and the value chain, namely:

- Agrostar, which is a marketplace for farm inputs, saw the revenue generated through its app triple within 3 months
- DeHaat, a company that provides market linkages as well as advisory and inputs to farmers, saw a 3X spike for digital advisory services and a ~3.5 X jump in overall demand
- Ninjacart, which helps disinter-mediate the supply chain by connecting farmers directly with HORECA players, is back to pre-COVID-19 levels and has seen a 20% rise in their app-based ordering patterns
- Aquaconnect, which has created a full-stack technology offering for shrimp and fish farmers, saw a 18X increase in app downloads, with a large chunk of their users demanding end-to-end marketlinkages

While it will be quite some time before agri-marketplaces see the scale of adoption e-commerce companies enjoy in urban areas today, we expect the boost to agri-marketplaces and platforms to sustain and even rise sharply in the coming months as farmers increasingly get comfortable with newer ways of working.

# Rise of Input Marketplaces

AgroStar uses its proprietary agronomy knowledge, data and technology to suggest the right solutions to Indian farmers. This information is accessible both through a call centre and an app in the farmer's local language. Farmers on the AgroStar platform can post photographs of their crop-related problem pictures on the app to get scientific advice in near real time. Thereafter, over 200+ brand partnerships that have been developed over the years coupled with Agrostar's tech enabled last-mile delivery network enables them to deliver authentic products at the farmer's doorstep in rural India.

When the pandemic hit in mid-march, the agri-input supply chain was disrupted, hindering Agrostar's ability to deliver products. Their ability to give agronomy advice via the call center was also severely challenged as most sales agents at the call center needed to travel to their hometowns, where connectivity issues meant that bandwidth available had shrunkovernight.

AgroStar decided to take a content-first approach on the app and focused on giving high quality, personalized content to each farmer. The tech and product teams worked tirelessly to ensure that content curation was better than ever, so that farmers could find solutions to problems based on their regions, crops and interest areas. The content-first approach started bearing fruit as engagement increased by 67%. In the subsequent weeks, as the supply chain started reviving, AgroStar also observed a 3X jump on their app revenues as well.



# Disintermediation : The Way Forward

Ninjacart , one of India's largest agritech startups, is helping disintermediate the supply chain by connecting farmers directly with buyers in the HORECA segment as well as standalone vegetable stores and supermarkets alike. Till date Ninjacart has helped create market linkages for more than 20,000 farmers, helping them realize upto 20% more revenue compared to the local mandis.

The sudden imposition of the lockdown resulted in traditional retailers being left with no alternatives for procurement of fresh produce as most major mandis were shut down. Even after the lockdown lifted, the traditional supply chain took time to become functional again. This led to retailers seeking alternative solutions that could connect them directly with farmers. In less than 4 weeks post-lockdown, Ninjacart is back to pre-COVID revenue levels and is seeing strong growth momentum on adoption.

Ninjacart was quick to launch initiatives to help distressed farmers in getting their produce to market. With their initiative “Harvest the farms”, they identified farmers in need of help in liquidating their crops and offered to buy their vegetables at a nominal price where the farmers could recover the cost of production. Using their well-established supply chain, they then sold these vegetables at a lower price to customers. Through this initiative Ninjacart was able to help more than 150 farmers in selling their produce, creating strong farmer loyalty for the company.

“During these uncertain times, while we are dealing with supply chain disruption, we cannot overlook the farmer's plight and let the harvest get wasted. With India's largest fresh produce supply chain and extensive distribution network in cities, believe we can leverage our capabilities to help farmers harvest the produce, let customers buy directly, prevent food wastage, and reduce farmer losses.”

Thirukumaran Nagarajan,  
Co-Founder and CEO, Ninjacart

## App Based Advisory Services

Aquaconnect , a full-stack aquaculture technology venture, works with shrimp and fish aquaculture farmers to improve their farm productivity and establish market linkages through AI and GIS remote sensing technology.

Aquaconnect's omnichannel marketplace also allows aquaculture farmers to transact with hatcheries, feed producers, farm equipment manufacturers, laboratories, financial institutions, seafood buyers, processors, exporters, and certifying bodies.

**18X**

increase in app installs  
between Mar to Nov,  
i.e. in 3 quarters

**21X**

increase in farms  
under management  
from Mar to Nov i.e. in  
3 quarters

Typically, aquaculture farmers get advisory support through on-ground field agents, who would personally visit the farms. Such services, obviously, could not be provided during the lockdown. In this situation, Aquaconnect's app-based advisory solution was able to easily bridge the gap, helping owners living in tier-II and III cities remotely manage their farms located in rural areas.

The sharp drop in exports during this period, prompted aquaculture farmers to turn to domestic consumption for their products. To achieve higher realizations, farmers wanted to connect directly with businesses by bypassing the middlemen. Aquaconnect helped farmers establish these linkages with domestic online & offline seafood retailers thereby reconfiguring domestic supply chains.

App Based Advisory Services

## Overview of Aquaconnect's COVID Influenced Product Development

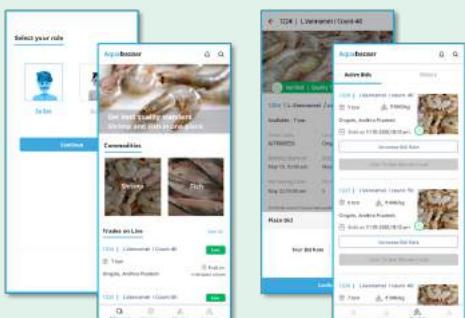
Through the spike in adoption of their advisory platform, Aquaconnect realized the entire supply chain was disrupted due to the lockdown and critical interventions were required at each step. A survey of 450+ farmers revealed that both helpline based advisory services as well as creation of domestic market linkages were the need of the hour. To address these, they baked in a telephone based helpline support as well as an online bidding platform for connecting buyers with farmers.



### COVID19 Lockdown Helpline Support:

Aquaconnect launched an emergency helpline support to support Indian shrimp and fish farmers during the pandemic lockdown. Through the helpline, they offered on-call support for aquaculture farmers to provide information on lockdown regulations and farming related queries.

Their online bidding platform, Aqua Bazaar, helped improve supply side discovery by buyers, without having to rely on middlemen. With farmers having to resort to domestic sales, the creation of such linkages could mark a long-term shift in the post-COVID era supply chains.



### Aqua Bazaar - E-bidding Platform:

Aquaconnect launched an e-bidding platform to enable farmers to directly sell to the buyers without the intervention of the middlemen. The marketplace brings transparency, reduces counter-party risks and infuses liquidity into aquaculture value chains.

# Digital Farm Advisory and Full Stack Farmer Services

DeHaat, offers end-to-end agricultural value chain services through its online platform to farmers, including distribution of high quality agri inputs, customized farm advisory, access to financial services, and market linkages for selling their produce. Around 3,86,000 farmers consume its AI-enabled farm advisory and agri-inputs services. DeHaat also aggregates corn, wheat, rice, fruits, and vegetables from farmers on their platform through their 1284 exclusive strong micro entrepreneur-network, and directly supplies to over 300 commodity bulk buyers, including retail chains, e-commerce players, FMCG giants, and SME food processors.

**350%**

Growth in demand for input and output

**3X**

Increase in demand for digital advisory

DeHaat's strong network was particularly useful when the supply chain linkages to the farmers suffered a breakdown during the COVID-19 lockdown. Mandis, output traders, input retailers and logistics players were unable to work and there was additional disruption due to paucity of manpower. DeHaat witnessed a massive surge in demand for its services from farmers. App downloads and call center enquiries shot to three times of normal volumes, with farmers seeking crop, input, and output marketing support.

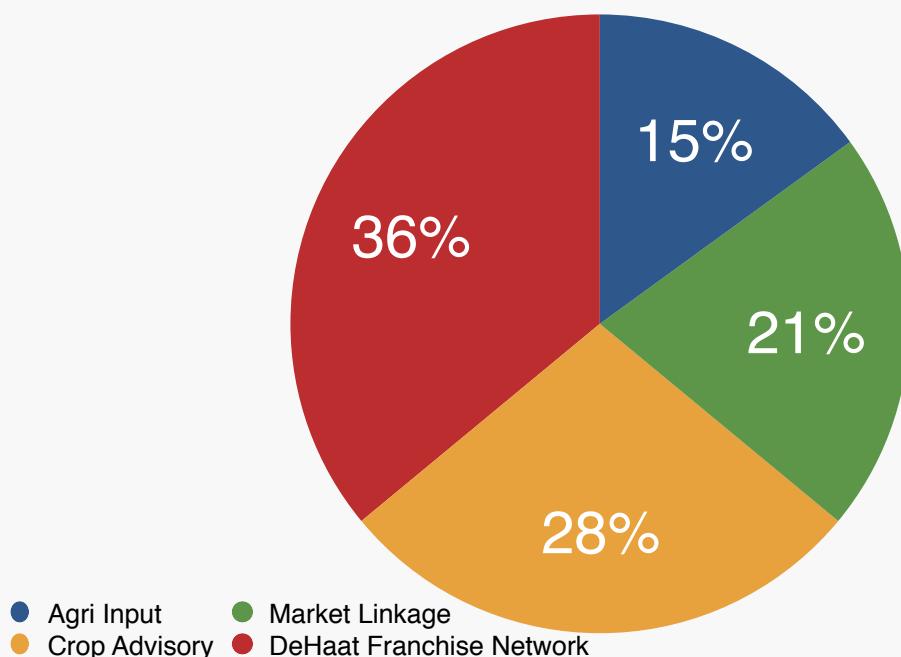
DeHaat also increased digital engagement with its stakeholders – acquisition, onboarding, monitoring, and deployment of services to the microentrepreneur network happened remotely during the lockdown period, without any drop-in efficiency.

With a strong presence in states like Bihar and Uttar Pradesh, which saw number of migrants returning from the cities, DeHaat also saw a 450% spike in enquiries for microentrepreneur franchisees and a general improvement in digital adoption, driven by the movement of this more digitally aware population.

Digital Farm Advisory and Full Stack Farmer Services

## Demand Spike Breakdown for Digital Engagement

Weekly Growth of Inbound Queries



DeHaat received almost 4X their normal inbound request for crop advisory during the lockdown period. About 40% were related to input availability, 32% were related to advisory and 28% were related to market linkage for crop produce.

# Agri e-commerce during COVID-19: Status and Trends in India

The nationwide lockdown came at an unfortunate time for farmers which imposed challenges like shortage of farm labor, farming equipment and agri inputs such as seeds and crop protection products. While the Indian economy witnessed a huge hit because of the Coronavirus COVID-19 Pandemic and the resultant lockdowns, agriculture did emerge as the silver lining in the current pandemic scenario.

According to sowing data of kharif season 2020, released by India's Agriculture Ministry, there was nearly 10% more area sown this year, as compared to last year. This shows that agriculture as a whole managed to cope with the pandemic better than other sectors. This situation aided the agritech companies in the digital space to respond, and advance their penetration with thoughtful interventions, and farmers' acceptance of digital platforms.

During COVID-19, there has been an increasing trend to leverage various e-commerce platforms for last mile delivery of essential agri-inputs to farmers. Additionally farmers received crop-specific advisory, funding, and market linkages to buy their produce back from various agritech players. Such crucial support in a crisis was instrumental in winning the farmers' trust. It also helped build their reliance on these agritech platforms for their farming needs. The Indian agritech eco-system has been growing rapidly since many years due to increasing penetration of smart phones and internet in rural India. This eco-system is further fuelled by new start-ups with a good influx of funding and evolving hyperlocal logistics players.

For the first time in a generation, digital technologies are enabling farmers to achieve a quantum leap, thereby radically improving their livelihoods. While improving yield is good for a farm's profitability, it is also critical to address the growing demand for food coupled with minimizing environmental impact. Global agricultural supply chains are also seeing demand shifts and greater integration. India with its large landmass and diverse agro-climatic zones is a key player in the burgeoning global food market. However, there is significant headroom for improvement in India's agri-export performance.

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Going forward, the technology innovation in agritech with AI (Artificial Intelligence) based services is key for improving farmers' overall productivity and income. These services include, authentic agri-inputs, advisory, and advocacy for safe and sustainable food production for domestic and international markets. The marketplace model is an initiative which has witnessed significant growth in India. Companies are actively trying to connect buyers and sellers, for providing farmers with more choices. It not only provides better infrastructure to onboard the existing community of traders/farmers but also helps them connect the missing dots. It also brings larger reach to various agri-value chain partners and eventually extends support to farmers to optimize their investments and returns.

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# Emergence of Farm to Consumer Brands

Indian consumers today are better educated with improved access to information. This has led to the evolution of conscious consumers. They foster greater awareness and interest in the supply chain that lies behind the products they consume. The past few years, especially, have seen the emergence of farm-to-consumer brands (F2C). However, pre-pandemic they were at a relatively nascent stage finding limited adoption only among the internet savvy, quality seeking consumers.

The pandemic, however, has led to increasing levels of health consciousness, with consumers becoming more vigilant about eating healthy and unadulterated food. This has led to a tremendous increase in demand for F2C brands that are able to assure quality and provide traceability back to source. Moreover, with people shifting to online ordering due to the lockdown, this could prove to be a watershed moment for F2C brands as they look to disrupt traditional distribution channels.

Technology is a key lever through which F2C brands were able to maintain safe and reliable delivery of the produce despite lockdown challenges. There was a shift in distribution channels from retail to consumer doorstep delivery. This saw the emergence of various players entering last mile distribution of fruits and vegetables – from larger e-commerce players like Flipkart to unrelated players like RedBus. However, the brands that gained the most were the ones that managed majority of their supply chain, down to the last mile, in-house – like Country Delight that saw 98% fulfillment during lockdown.

Interestingly, the demand surge and push towards traceability was seen across categories, ranging from fresh fruits and vegetables, to meat, seafood, and dairy. In the following section, we dive deeper into case studies on Clover Ventures, and Orinko, which provide branded fresh produce to consumers, and FreshtoHome and Country Delight, which are disrupting the supply chain in the meat and dairy industries respectively.

# Surge in Branded Fresh to Consumer Product

FreshtoHome is a direct-to-consumer fish and meat delivery brand focused on delivering fresh, chemical/antibiotic-free produce. FreshtoHome has direct control over sourcing fish through harbors / contract farmers and uses an integrated technology platform to bring fish from coast to door in almost one-third the time as the traditional supply chains.

**2.5X** Growth in volumes

**1/10** Reduction in customer acquisition costs during COVID

FreshtoHome has seen a steep growth in demand during the lockdown period, adding both new customers and seeing strong retention of existing ones. Traditionally, almost all seafood and meat purchase were done through neighborhood wet markets. But, with wet markets shut and the ramped-up fear of unhygienic produce and unsafe supply chains, customers switched to FreshtoHome. Demand for seafood also surged because of the imminent fear around chicken (biggest alternative to seafood for customers) being linked to spreading COVID-19 and the high fluctuation in its prices. The combination of these resulted in 2.5x growth in volumes for FreshtoHome.

On the supply side as well, COVID-19 created a rush to online marketplaces like FreshtoHome. Auction houses, where a majority of the seafood is typically sold were closed due to the lockdown and large harbors were not functional. Since FreshtoHome has a vertically integrated supply chain for marine fish, with access to its own small harbors, it was able to operate smoothly and obtain quality supply. On the farmed product side, FreshtoHome was one of the few players that had access to markets while various other farmers had to dump their produce. More contract farmers wanted to join FreshtoHome's platform during COVID-19 crisis period, which has created a positive impact on longer term supply pipeline for the company.

While there were temporary breaks in logistics, and the variety of seafood FreshtoHome could bring to its customers shrunk, the lasting impact of COVID-19 was positive. As a brand, FreshtoHome promises a reliable and safe supply chain, and is able to maintain its pace of growth.

Surge in Branded Fresh to Consumer Product

## Chicken or Seafood?



FreshtoHome benefited from COVID tailwinds on both the supply and demand side. On the demand side, an unexpected boost came through the rumors that poultry spread coronavirus. FreshtoHome saw a spurt in consumer demand that stayed on with them throughout the period of volatility in chicken prices.

# Increased Demand for D2C Milk Brand

Country Delight, a direct-to-consumer milk and dairy products brand, serves over 200,000 households in Delhi, Mumbai, Bangalore and Pune. It uses technology to manage the end-to-end supply chain, from the dairy farm to the customer's doorstep in the metros.

**50%**

Surge in demand  
during COVID

A combination of factors led to Country Delight seeing positive growth conditions during the start of the COVID-19 crisis. Two factors stand out: 1) dairy was considered an essential product and Country Delight owned its entire supply chain 2) consumer demand for traceable, high-quality branded milk increased.

Even on day one of the lockdown, Country Delight was able to service 92% of the households. A critical enabler was having full upstream and downstream control of the supply chain, including last-mile logistics. This enabled much better predictability for Country Delight and enabled them to preempt and manage situations by proactively working with local authorities.

Country Delight also witnessed a shift in consumer preferences towards branded, safe produce during and after the lockdown. The brand provided the very features that customers prioritised in the current crisis — a traceable supply chain, reliable safety measures, and contactless delivery at the doorstep. There was a 50% growth in customers during this period, and these customers stayed on post the lockdown opening up. Country Delight has prudently focused on conserving operations rather than chasing growth in this period, otherwise this number might have been higher.

## Various Measures Taken by Country Delight to Emerge as a Safe Dairy Brand Post-COVID

Doubled distribution locations from 36 to 72 so that fewer employees per location

Spread shift timings to longer hours (2am to 10am) so that there is lower concentration per hour

Daily communications to the customer through app on upcoming delays, disruptions and measures taken

Sent daily temperatures of delivery personnel serving customers

# Transition from B2B to B2C for a Fresh Produce Company

Clover, a supplier of perishable fresh produce, sources its produce from a managed farm network that practices demand-led cultivation and is facilitated by full stack agronomy support.

On the supply side, this asset light model taps into India's plentiful, but fragmented and underutilized farm acreage and brings to its member-farmers the benefits of consolidated and predictable demand, and expert agronomy support. On the demand side, the model provides customers with traceable, perennially available, and consistent high quality produce, at a competitive prices.

**3X**      Growth in sales post COVID

Clover's distribution strategy underwent a marked shift with the onset of COVID-19; as much of their traditional HORECA clientele ceased to function, and large format modern trade outlets became operationally erratic. General trade emerged as the singular source of demand for fresh produce in the early days of the pandemic, forcing the company to rebuild its supply chain to service the category.

As the country entered the second month of the pandemic, the company was impacted by logistical constraints. On the supply side, labour and agronomy staff were unable to commute to the farms, while on the demand side, warehouses were inaccessible, sales staff couldn't function smoothly, and essential services passes were easier to access in theory than in practice.

However, by May, Clover had rebuilt its supply chain to include new customer segments including direct sales to apartment buildings and housing societies. Clover's staff needed to be upskilled to deal with the challenges of Direct-to-Consumer sales. Safety became a top priority for both the company and its customer base, necessitating the building of new SOPs. This new segment is likely to be a major driver of growth for Clover, even as traditional customers begin to come back online.

Clover's network of managed farms, which earlier had a member base mainly of horticulture farmers, is now seeing enhanced interest from entirely new farmer segments. Notably floriculturists with high quality protected farming assets are keen to transition to vegetables to escape the uncertain future of their sector.

# Demand for Food Safety and Traceability Drives Growth at a Hydroponics Startup

Orinko manages a network of peri-urban hydroponic ‘cloud-farms’ that cultivate branded fresh produce. Orinko’s farms focus on perishables that are commonly consumed in India and not on niche exotic produce. The company’s SOP-driven tech-stack allows for remote monitoring and quality control across its network of farms.

**333%**

Increase in sales attributed to consumer demand for safety and traceability

The COVID-19 outbreak saw increased dependence on e-commerce channels, heightened sensitivity to food safety, and rising importance for transparent supply chains among consumers. This led to a surge in growth for Orinko, which sells much of its produce through online channels.

Orinko was quick to list its produce on a variety of digital store fronts to increase its reach, while also establishing physical store fronts within apartment complexes and housing societies. Direct sales within these apartment complexes accounted for over 10% of the company’s sales within a month.

It was not all positive, though. The company did struggle in expanding its more traditional channels, especially general trade, where cash collections and deliveries were hampered by restrictions on movement. On the supply side, night-time curfews meant that the farms could not be monitored around the clock and the movement of farm labour was also curtailed.

Orinko sees quality and trust being major drivers in the fresh perishable space in the months to come. The company also predicts that producers will focus on quality control and branding and leave distribution to existing channels, rather than build their own Direct-to-Consumer supply chains.

# Growing Conscious Consumerism and the need for end-to-end traceability in agri supply chains

“Conscious consumerism will be the new trend post COVID era which will gain significance. Steps taken by thoughtful consumers - to buy sustainable products, to know the environmental impact and to recycle - will definitely change the way businesses will look at supply chains in the near future”.

‘Conscious lifestyle’, ‘conscious living’ and ‘conscious consumption’ are phrases which have been around for almost a decade. Today, in a world full of uncertainty and food safety issues, these are no longer posh phrases but have become a widespread demand for sustainable supply chains. Responsible consumerism will push brands to promote sustainable farming practices, eco-friendly production methods, and eventually end-to-end traceability.

Generally traceability means knowing where the produce comes from but the larger objective of traceability is often misinterpreted. According to us, traceability means transparency of every element of the value chain. At ITC, we go a step beyond by working with farmers and supply chain partners in producing a crop by ensuring visibility of farmer (complete information of his/her profile), farm (understanding of soil), input (seed, fertilizer, pesticide used), practices (soil and water conservation) and sustainability (biodiversity and human rights compliance). This is achieved through our digitally trained village level agri-technicians who capture the information in tablet through our e-choupal 4.0 digital crop monitoring tool. The information collected is also later used to provide customized crop advisory to farmers besides meeting the compliance requirements of customers.

A typical use case of our traceability linked production system is our Integrated Crop Engagement (ICE) programme which focuses on increasing the “Food Safe” exports from India meeting US and EU standards. The programme focuses on adding value at each stage of the farm value chain by establishing sustainable production systems on a food safety platform maximising farmer returns. We work with the philosophy of producing-the-buy rather than buying-the-produce, which means understanding the requirements of importers/customers and taking interventions at the farm and the entire value chain so as to have the produce meeting the requirements.

Dedicated best-in-class digital systems and procedures have been deployed to ensure complete traceability throughout the value chain. In the spice value chain, a bar code system provides end-to-end traceability starting from the farm practices, to procurement and moving through handling, processing and manufacturing. With this end to end traceability system a customer anywhere in the world should be able to track the performance of a village/farmer under the three sustainable pillars of economic resilience (eg. farmer income), environmental integrity (eg. water used, biodiversity) and social development (eg. labour wages, women empowerment).

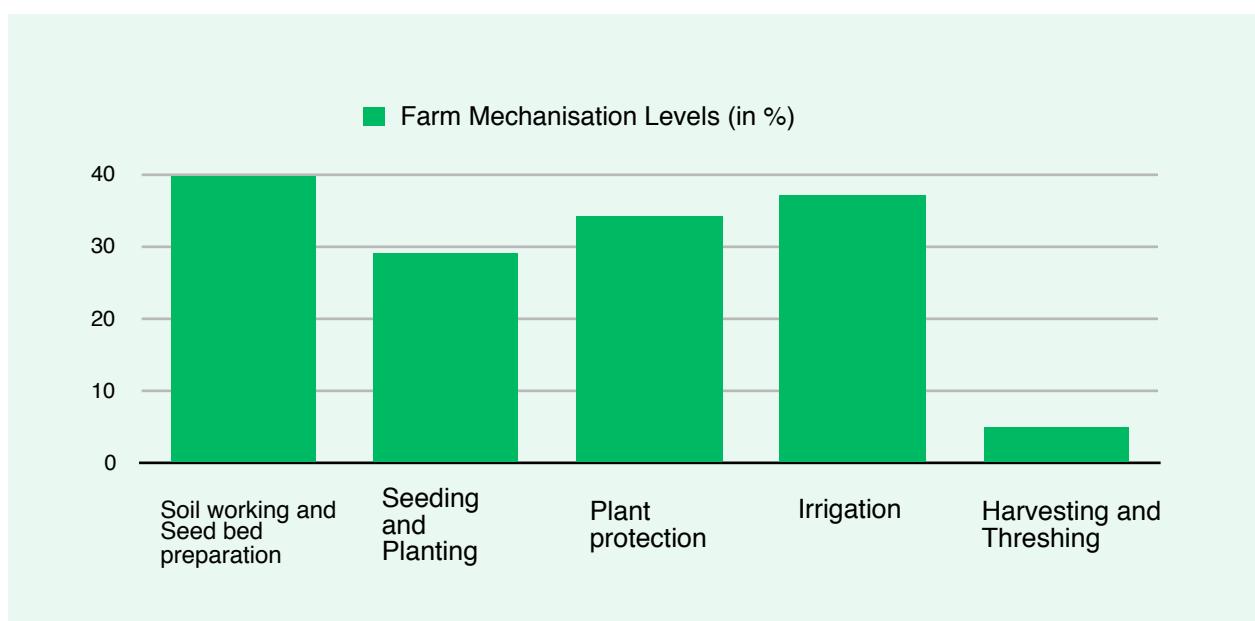


**Sanjiv Rangrass**

Group Head -  
R&D, Sustainability & Projects  
ITC Limited

# Precision Agriculture - The Next Wave of Agritech Innovation

Historically, India has had low levels of farm mechanization compared to mature agricultural economies. While mechanization levels have been rising quickly in recent years, we still continue to be a country that is heavily reliant on manual labour for a large portion of farming activities.



The pandemic led to two major disruptions in day-to-day operations in the country:

- Mass movement of migrant labour back to their homes meant that parts of the country that suddenly were devoid of a workforce to carry out basic operations
- Restricted movement of agents to farms due to the lockdown meant that agribusinesses and BFSI institutions were left with no reliable ways of collecting on-ground data

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Several innovative agritech startups were already looking to automate data collection and basic operations, but the lockdown has provided a strong fillip to the segment. The next few case studies focus on this phenomenon. Companies like Cropin witnessed a spike in demand for remote monitoring solutions by BFSI companies, while others like Fasal and Eruvaka found increasing buyers among the farming community for their hardware solutions. We strongly expect adoption of this sector to grow as end users develop more conviction on the benefits of investing in such technology. Given the lack of such solutions even globally, this could be a great opportunity for the Indian agritech ecosystem to gain traction beyond their home markets as well.

## Remote Monitoring Solutions

Cropln's mission is to maximise the per acre value for stakeholders in the agriculture sector. The company does this by enabling agribusinesses and financial institutions to remotely monitor by providing farm level data and yield prediction through a combination of satellite imagery and on ground data collected through mobile applications.

When businesses could not send field agents to farms to get regular updates on production data, due to the pandemic and lockdown, they started looking for solutions that would allow farm level monitoring without manual interventions.

Cropln adapted well to this opportunity by doubling down on inside sales and witnessed a 128% spike in viable leads, with several companies asking for assisted traceability solutions as well.

**128%**

Growth in leads  
for remote  
monitoring

**37%**

Increase in  
deals closed  
online

Remote Monitoring Solutions

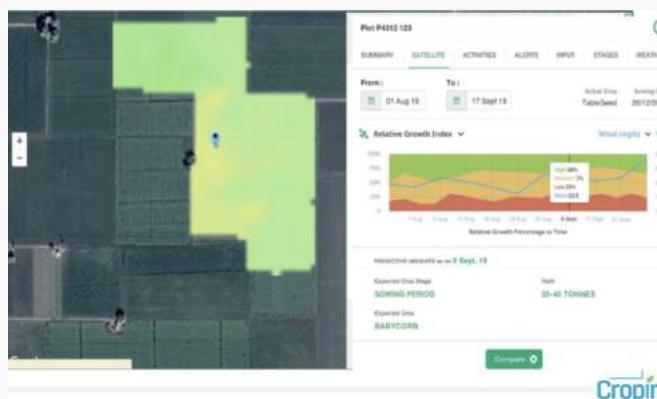
## Snapshot of CropIn's Offering for Remote Monitoring of Loan Assets

Due to the lockdown, banks were unable to send people on the field to monitor loan assets. Using the powerful AI/ ML models built by CropIn and layering it with satellite imagery, CropIn was able to provide remote monitoring of agricultural loan assets.



Banks provided the bulk list of the agricultural land which are their loan assets, and by utilizing CropIn's solution, insights were provided in terms of crop growth and health at a plot level. Depending on crop performance at the plot level, banks used this information to provide technology interventions to improve field output and interact with the farmers closer to the harvest date to ensure that the farmers were able to return the loans on time.

This helped banks keep their NPAs low and provided a platform through which they were able to interact with the farmers and continue to build on their loyalty.



## Automation Solutions

Eruvaka, offers advanced pond management and diagnostic systems for the aquaculture industry that utilize complex algorithms, IoT and machine learning to precisely feed the shrimp and monitor the pond parameters round the clock. These systems help farmers to improve profitability, protect pond ecosystems by reducing the feed usage significantly, and provide farmers with valuable actionable insights. With customers in over ten countries, Eruvaka is rapidly deploying its cloud-based solutions across the world to achieve its mission of accelerating technology adoption in aquaculture to make it more resilient and sustainable.

The summer crop (January to April) is the most active crop season for seed stocking in India's shrimp farming industry. The timing of the pandemic and the consequent lockdown could not have been worse for this industry. Farmers were busy preparing for the summer stock until mid-March. The day-to-day aquaculture operations were significantly impacted. The uncertainty in international markets, disease outbreaks, and labour shortage, forced a majority of the farmers to carry out emergency harvests, while others were left with no choice but to delay harvests. The migrant labourers, who constitute over 90% of the aquaculture workforce in India and play a crucial role in the proper functioning of the shrimp farms, had moved back to their home states by end-March as a result of the lockdown. Over 70% of the shrimp aquaculture ponds suffered from severe manpower shortage, delaying the start of new crops.

The labour shortage prompted several farmers to evaluate automated feeding and farm management solutions that could help them managed feed operations and monitor ponds in real-time with limited manual interventions. To leverage this opportunity, Eruvaka has appointed dealers and field salesforce in two major markets of Andhra Pradesh - Krishna and West Godavari. An interesting point to note about these dealers is that they have been Eruvaka customers for over 8 months and they signed up for the dealership when they realised the growing market potential of its solutions in the current scenario. As a result, there has been a 3X growth in farmer enquiries for auto-feeder and pond monitoring devices, especially from medium and large farmers.

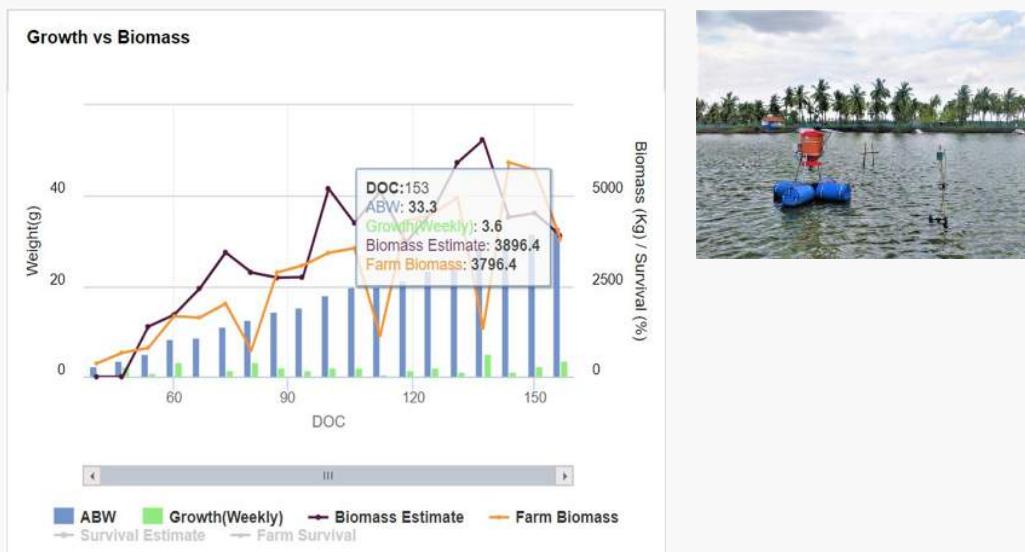
**3X**

Growth in  
enquiries for  
auto-feeder and  
pond monitoring  
devices

Automation Solutions

## Snapshot of the benefits of Eruvaka's Solution for shrimp farmers

A farmer with over 30 acres of Shrimp farms in West Godavari region of AP approached Eruvaka to deploy auto-feeder and pond monitoring solutions in an endeavour to achieve higher productivity, better growth and lower feed conversion ratio (FCR). With traditional cultural practices, the farmer had been harvesting the ponds with 1.7FCR, with an average body weight (ABW) of 16-17 grams per shrimp (60 count per Kg). One of the main challenges he faced was frequent virus outbreaks due to cross-contamination of ponds by farm labour activity. By deploying Eruvaka solutions, the farmer was able to avoid cross-contamination, improve the efficiency of feed operations and achieve higher yields with 1.2FCR (30% improvement) with 33.3gm ABW (30 count per Kg)



## Digital Data Collection

Fasal, is a farm level, crop-specific and crop stage specific actionable intelligence platform for horticulture. It helps individual farmers, vineyards and plantations in optimising their cost of cultivation along with improving yield and its quality. Fasal currently serves its customers in Madhya Pradesh, Chattisgarh, Karnataka and Maharashtra.

**38%**

Growth in leads  
from areas with no  
pre COVID  
presence

While many farmers were unable to go to their farms when the lockdown was imposed, those using Fasal had access to real time conditions of their crop, soil, and farm's climate in their hands, literally. Fasal farmers used the recommendations of the Fasal app and farm data to guide their farm labour in day-to-day operations in areas like irrigation, disease management, pest management and weather risk management. Not only did they get a good harvest at the end of the season, they also achieved it at a comparatively lower cost of cultivation, helping them recover their costs in a distressed market.

The Fasal team also worked with many buyers to ensure the produce of the farmers was sold better. With the backing of the data and intelligence for the entire season from the farm, Fasal provided traceability to farmers, the practices followed in cultivation, the growing conditions for the yield, and assurance of its quality. This allowed certain Fasal farmers to get higher revenue realisation than the existing market rate.

Fasal also witnessed a 38% increase in month-on-month enquires from areas where they are yet to commence business development exercises. Both individual farmers and corporate customers wanted actionable solutions for decreasing cost of cultivation or remote farm monitoring.

# Precision Farming: Next Wave Of Indian Agritech

While COVID-19, understandably, dominates today's narrative it is important to stay positive and focused on the big goals outlined by the Government such as the inspiring goal of building a \$5 trillion economy by 2022.

Rural India and agriculture in particular will be a key driver to achieve this goal. We've always known this but in the last few rather difficult months it's a realization that has been reinforced by the manner in which the rural economy and the agricultural economy are propelling the nation forward, despite the challenges of COVID-19.

The Government is also using this window of opportunity as evidenced by its recent landmark announcements on APMC and ECA. Change is in the air and we see the timing as propitious for a new wave of advancement in Indian agriculture. From our perspective as the country's largest tractor and farm equipment player, we see two positive areas of impact potentially triggered by COVID crisis.

The first is an increase in mechanization through an increase in machine rentals – signalling a faster shift from labour to machines and from simpler to more advanced machines. The second is the greater adoption of digitization – the use of digitally powered solutions such as advisory apps, IoT based solutions and precision farming solutions. Both these areas of impact are influenced by the increasing need for safety, and the resultant increase in popularity of "low touch/no touch" offerings. Agri-India's rising confidence in and comfort with digitally delivered services are also encouraging factors.

As an organization we have been working on precision farming for the last few years. Our journey started with the realization that a country like India, with its millions of small landholders would benefit disproportionately by bringing more data driven intelligence to otherwise intuitive decision making, and more operational efficiency to otherwise traditional field operations. The challenge, as always with new technologies targeting Indian farmers, is in creating solutions that are affordable, appropriate for their fields, simple to use, and demonstrate clear value.

As pioneers of mechanization in India we wanted to take the lead in developing such solutions. There are 3 key learnings we have gained:

- a. Farmers need to see monetary value being created: All roads lead to value creation for farmers. Unless solutions can deliver incremental value add for farmers they will not be interested in adopting and sticking with precision farming solutions. While acceptability of digital solutions will no doubt be aided by the rapid increase in rural smart phone usage, the increased comfort level of using digital devices and the possible rise of low touch solutions in a COVID-19 world, the truth is adoption requires a clear demonstration of incremental value.
- b. Build local, go global: According to FAO statistics there are more than 550 million small landholders in the world, so disruptive solutions built in India can create global markets. Affordable, simple precision farming solutions incubated and commercialized in India to fit the exacting requirements of Indian farmers will appeal to small landholders across the world. Start-ups in India are realizing this and the Government of India too can support this in different ways.
- c. Spin a web of partners : From our experience it is best to work with and in a web of partnerships. We work closely with technology partners who translate cutting edge technologies into farmer solutions quickly and frugally and to enable this we have in fact invested in 3 such start ups, though we work with several more. We also work with a network of on ground service providers who collaborate with us to educate and influence farmers, deliver on ground services and improve farmer practices. We consider them technology partners too from a go-to-market perspective.

To conclude we need to think of precision farming in India as a new industry in the making – encompassing manufacturing and services. Establishing this industry is a big opportunity that can be accelerated by harnessing specific farmer behaviours that triggered by the pandemic. This can power a new wave of economic growth – driving India to its goal of becoming a \$5 trillion economy by 2022.



Ramesh Ramachandran

Senior Vice President -  
Farming as a Service & Head  
of Farm Sector Strategy  
Mahindra Rise

## Creation of E-Markets

The last few months have created a perfect storm of events to accelerate the digitization of agri-markets. There are multiple key enablers for e-markets to gain traction in India - COVID forcing comfort with digital selling due to lack of access to physical markets, macro policy encouraging digitized trade and transparent pricing, standardization of quality as a key driver for multiple stakeholders, and warehouse / logistics infrastructure that allows custodianship and specialized offerings to serve a digitized supply chain. We expect to see several startups that will look to participate in this movement and help connect farmers with buyers across the country through a digital medium.

Creating market linkages through digital channels has gathered pace as different stakeholders look to embrace newer opportunities. Be it connecting farmers directly to buyers (like Ninjacart) or traders to buyers (like Bijak), we are seeing new models emerge where output sale is no longer limited by the reach of mandis.

Supporting infrastructure for creation of e-markets is also gaining momentum. There is a significant gap in the warehousing capacity at the farm gate, which leads to farmers selling crops at sub-optimal prices. Companies like Samunnati and Arya are helping farmers prevent such distress sale through innovative financing and warehousing models. To ensure better price discovery, SaaS companies like Agricx and Intello Labs are helping companies grade quality of produce through visual images.

The next section covers how COVID-19 impacted four companies working on creating market linkages and allied activities - AgNext, Samunnati, Stellapps and Arya - and detail out their responses to the pandemic.

## Increased Demand for Quality Assessment Technology

AgNext, provides a technology platform -“Qualix”, for rapid commodity assessment solutions across procurement, trade, production and consumption of food and agri-value chains. The Qualix AI engine uses spectrometry, computer vision and remote algorithms, delivered through an integrated hardware and software interface for accurate and instant quality analysis. It focuses on verticals like beverages (tea, milk, coffee, cocoa), grains (rice, wheat, maize, barley), oilseeds (soybean, mustard), spices (turmeric, chilli, pepper, ginger, menthol), and animal feed, and works with clients across diverse geographies in India and has made early inroads into global markets.

**20%**

Increase in digital sales conversion

**150%**

Increase in demand for quality

AgNext witnessed a steep increase in the demand for their solutions. This was primarily due to the growing sensitivity to quality and traceability in midstream food processing, brought about by the end-consumers demand for quality and traceability of food, during the COVID-19 outbreak. AgNext saw B2B customers across dairy, animal feed, rice processors, and exporters articulate and demand tech solutions for their procurement operations. There was also shortage of manpower and laboratory testing in procurement processes across the agri-food industry, which might have also partly contributed the spike noticed.

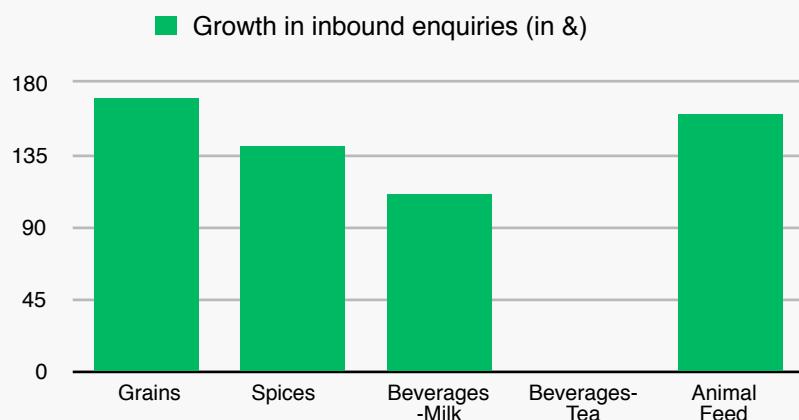
Both these factors led to approximately a 150% increase in enquiries received by AgNext during the first two months of the lockdown. Another testament to the need of such solutions was the sharp increase of 20% in sales conversions via digital demos and meetings, unprecedented in B2B enterprise technical sales cycles.

One negative impact of the pandemic was felt by the tea industry, which lost out almost INR 2,000 Crores of the first flush harvest due to the lockdown. Tea is an important sector for AgNext, and it has taken an active partnership role in working with the Tea Research Association and will be setting up a dedicated AI facility to bring quality-related tech solutions to the tea industry to improve value and global competitiveness. Now that the plantations have resumed operations, it is expected that they shall actively work to deploy AgNext's solutions, despite it being a difficult year for them.

Solutions like the one AgNext provides will also see further demands as markets move online. The need for quality assessment is critical for price discovery in many commodities, and definitely important for any e-trading to take place or contracts via blockchain to be settled in the future.

Increased Demand for Quality Assessment Technology

## Snapshot of Demand Spike for Qualix During Lockdown



AgNext received almost 150% their normal inbound request for Qualix post lockdown. They also saw digital pre-sales engagement increase by 20% in this period.

# Growing Need for Dairy Technology Solutions

Stellapps, one of the largest dairy-focused IoT platforms in India, manages 10million+ litres of milk per day. It leverages advanced analytics and AI to create a full-stack IoT platform, - across herd management, quality testing, pricing, chilling center management, ERP, and finance – functions, which optimizes the dairy supply chain and drives significant value for farmers by improving farm economics, animal productivity, and enabling traceability. Stellapps offers a range of value-added services to farmers like direct farmer payments credit, insurance, and nutrition to enable financial inclusion of smallholder farmers and boost their profitability.

Stellapps serves multiple clients across Indian and Europe across categories such as dairy farms, cooperatives, and private dairies.

Stellapps, along with the entire dairy supply chain, was affected by the ecosystem's disruption caused by COVID-19. It was unable to execute USD 5.3 Million worth of orders in March and April. The HORECA segment, which constitutes 35% of dairy demand for the company, was not operational. However, by mid- April, the procurement, chilling centers and logistics started reopening. The pent-up demand in orders was rapidly served, with Stellapps fulfilling orders worth USD 2.7 Million in just four weeks.

The lasting impact of COVID-19 on Stellapps is positive, as demand has gone up for products that provide better visibility into the dairy supply chain.

The consumers' increasing demand for hygienic, and unadulterated dairy products can only be enabled through digitization. Dairy processors like Milma, Amul and Hatsun, who are customers of Stellapps, have deepened their emphasis on quality. There is growing demand for Stellapps' offerings from dairy processors, who are increasingly allocating larger parts of their spend to quality testing products. With smaller processors shutting down due to COVID-19 induced crisis, the dairy spend is shifting towards larger players, consolidating demand for Stellapps' product.

5

New customers added during COVID

4X

Growth in demand during COVID

Growing need for Dairy Technology Solutions

## Snapshot of Stellapps Offering for Dairy Processors

Stellapps saw a surge in demand from dairy processors:

The power of this digital transformation has been most evident during the COVID-enforced lockdown, with Stellapps- enabled milk processors functioning seamlessly. The ability to procure milk across thousands of centres in a 100% contactless manner allowed the dairies to adhere to sanitary guidelines released by government agencies. By enabling real-time remote monitoring of the procurement operations, Stellapps allowed the dairies to ensure that their customers continued to receive safe, traceable, and high-quality milk. In addition, the tech platform facilitated digital payments and hassle-free credit and insurance to marginal dairy farmers, allowing them to tide over the economic distress brought about by the pandemic.

In the wake of the pandemic, dairy processors struggled to balance their input and output as consumption dipped. The problem was more prominent in the case of dairy cooperatives which saw an increase in procurement due to the flush season and non-member farmers pouring milk to collection centers. Stellapps customers relied on data and analytics offered by the Stellapps smartMoo<sup>TM</sup> solutions to make informed decisions and balance their procurement.

Bhilwara Milk Union, a member union of the Rajasthan Co-operative Dairy Federation (Saras), was one such customer who successfully managed their surplus milk. Bhilwara district of Rajasthan was considered as the epicentre of the infectious virus in the state. Following which the entire district of Bhilwara was sealed. Bhilwara union relied on analytics provided by Stellapps solutions to optimize their rate chart to reach the optimum quantity of procurement. Bhilwara Union officials could easily monitor the procurement activities at the ground in real-time from the safety of their homes or office thanks to Stellapps. This would have been impossible with their old systems.

Soon after the lockdown, Stellapps started receiving more inbound queries regarding its digital solutions from some major dairy brands. Existing customers also increased their purchase orders. The order quantities increased by 437% whereas the order value rose by 398% compared to the same period last year. One of the most notable purchases during the lockdown was from the Bihar State Milk Co-Operative Federation Ltd. (COMFED) with orders of more than USD 700K.

## Agri Finance

The term ‘Samunnati’ means ‘collective growth, collective prosperity, collective elevation’. Started in 2014 as the only specialized Agri Value Chain Solutions provider, the organization is steered by one vision ‘to make market work for the small holder farmers’ by making the value chains operate at a higher equilibrium. Samunnati enhances the value of the agri- players across the value chain by providing, aggregation, market linkages, and advisory services with finance being an enabler – “a means than an end” that ultimately benefit the end beneficiaries - the smallholder farmers. Samunnati has its presence in more than 54 agri value chains spread over 19 states in India. Samunnati currently works with over 400 Farmer Producer Organisations and 330 Agri Enterprises, which in turn has an outreach to over 4 million farmers. The organization offers customized financial solutions to stakeholders across the agri value chain and the majority of Samunnati’s monetization is through financing activities

The RBI declared a moratorium on payments at the end of March as a way to ease the burden of the common man. Samunnati took a hit – as an NBFC, they could not avail of the moratorium on its own debt, but had to offer a moratorium to its borrowers. The lockdown and moratorium prevented the priority sector lending (PSL) that is usually accelerated by banks at the end of March, further impacting Samunnati’s liquidity.

Samunnati adapted to the new reality quickly. While offering moratorium to its own customers, it doubled down on its AMLA approach (Aggregation, Market Linkage, Advisory). This allowed it to deepen its client relationships by providing clients with market linkages, creating alternate avenues for sales - often far beyond their traditional geographic reach. This helped generate liquidity for its clients, which they used to repay Samunnati’s debt, resulting in better- than-expected collections performance. It then mapped the portfolio on basis of risk and exposure to decide future focus areas, considering the uncertainty caused by COVID-19 and its downstream implications.

**97%**

Credit collection vs target, enabled by holistic value chain approach

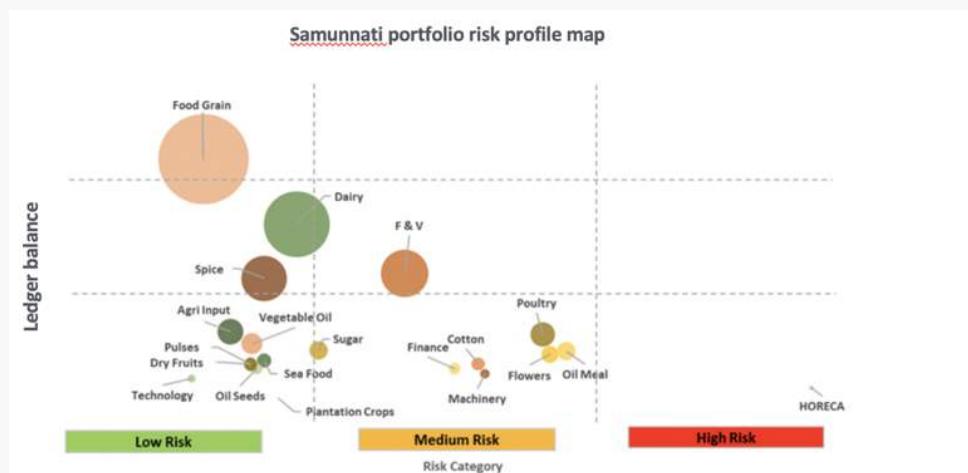
**1.5X**

Market linkages revenue vs target generating significant liquidity for clients

In the medium term, Samunnati forees significant tailwinds for agri-fintech. It envisions a future where aggregation of commodities takes place through electronic rather than physical means, and traditional mandis are disaggregated. Government reforms (repeal of APMC Act) will further pave the way while adoption will be accelerated by social distancing required due to COVID-19 and short supply of labor. Additionally, establishment of farm-gate quality metrics by agritech startups will allow for trust to be built between traders interacting remotely - enhancing the liquidity and tradability of various agri receivables (like warehouse receipts).

#### Agri Finance

## Samunnati Portfolio Risk Map



Samunnati focused heavily on managing risk during the entire lockdown. Their approach, however, was much more nuanced - rather than demanding repayments from customers, they helped them improve their business. They demonstrated the benefit of having a holistic approach to agri-lending based on their unique AMLA model.

## Commodity Finance Platform

Arya is a post-harvest services platform that offers warehousing, collateral management and commodity-linked credit services to agricultural producers and buyers. With over 2.5 million MT of warehousing capacity across 1,500 warehouses in 20 states, Arya has helped farmers, traders, FPOs and food processors avoid post-harvest losses through spoilage.

The company has also helped sellers of agri-commodities avoid distress liquidation of stock by disbursing over INR 250 Crores of credit. Arya's warehousing network spans 1500 warehouses across 20 states.

**22%**

Increase in warehouse usage by farmers

**6x**

Increase in demand for credit against warehouse receipts

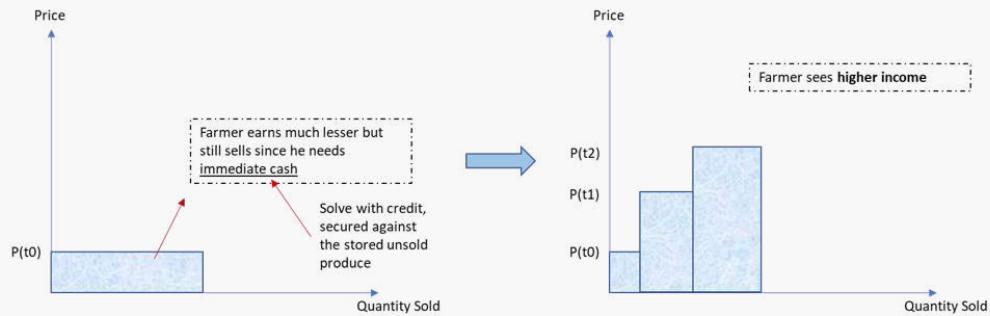
With mandis and output traders unable to work and paucity of manpower, the supply chain linkages suffered a severe breakdown during the COVID-19 lockdown. Consequentially, farmgate prices of agricultural commodities dropped by between 20-30%.

While Arya did face challenges in the early days of the lockdown, getting manpower to its various warehouses, it quickly scrambled its resources to obtain necessary permits and was able to capitalize on the massive surge in demand for its warehousing services from farmers. As prices remained muted, farmers realized that the best option was to hold on to their produce until prices became more attractive. Arya introduced flexible hermetic storage solutions closer to the farms for farmer producer organizations (FPOs). The company was further able to connect these FPOs with buyers on the NeML Spot Exchange and through its own digital platform, a2zgodaam.com. The need for immediate liquidity saw demand increase for credit against these warehouse receipts ("WHRs")- Arya's credit portfolio saw a 3x jump year-on-year.

Arya believes that the time is ripe for electronification of agricultural commodity markets, as digitization has improved transparency and facilitated discovery, technology developments are automating and standardizing quality, professional warehousing services are expanding, and trade credit is being facilitated against underlying commodities.

Commodity Finance Platform

## Impact of WHR Linked Credit on Farmer Incomes



# India's Agri-Markets' Revolution

Peter Drucker quoted, "The best way to predict the future is to create it." The trillion dollar question India needs to answer is whether we have the right tools to be able to predict a prosperous and equitable growth in agriculture which would have huge implications for India's overall development, employment, livelihood, wealth creation and food and nutrition security.

The staggering numbers of small holder farmers and the lack of credible information makes it extremely expensive and time-consuming for the Indian banking system to make "risk-return" credit calls and the usual response therefore is to put financing decisions on hold. The banks which tried using traditional manual risk management systems have been saddled with unacceptable defaults and have not been able to identify creditworthy agriculture customers - thus being burdened with significant Type I and Type II errors in financing non-risk worthy clients and leaving out the bankable borrowers, in the process. This is particularly true for post-harvest financing solutions that are grossly underserved in the Indian markets due to perceived risks, lack of price discovery, fragmented supply chain and a legacy of frauds.

The lack of investment has a ripple effect across the agriculture value chain in terms of food quality, traceability, safety, losses, imminent water and climate issues and also inhibits sustainable business relationships with market players. This results in frequent farm level distress and weak supply-chains.

The rapid advancement of modern age digital technology will transform the way financing is currently done not only by addressing the critical information asymmetry issue but also by driving efficient financing decisions with manageable risk and transaction costs. This would also drive efficiencies in the supply chain leading to more meaningful, resilient relationships between the key agriculture market players and small holder farmers.

An exciting development is that multiple players are now adopting and consuming technology to drive change. India has the 2<sup>nd</sup> largest number of Agtech and Foodtech companies disrupting multiple parts of the supply chain. They are riding on the Government of India's stack project popularly known as the JAM trinity, which has enabled universal unique identity and access to bank accounts.

The financial institutions are now embracing technology to address their two biggest deterrents - risk and transaction costs. New-age players have attracted top-notch professionals, private capital and best-in-class technology, which hitherto was not available to the Indian agriculture sector. The government push to build up FPOs also complements and enables digitization not only of the farmers but also of the entire crop life-cycle.

Blockchain solutions would facilitate trade in commodities involving multiple players with an acceptable degree of integrity and transparency. Technology enabling price discovery, food traceability/quality and digitization of commodities would result in optimal decision making by market players leading to resilient business models paving way for increased ability for financial institutions to take exposures in commodity financing.

The current health crisis and the resultant lockdown has given a big impetus to the post-harvest management technology services. Further, the recent Government of India announcement of the amendments to Essential Commodity Act and the APMC Act would attract significant capital and private investment in the agriculture infrastructure sector in the medium term. These developments would lead to exciting innovative financial solutions.



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