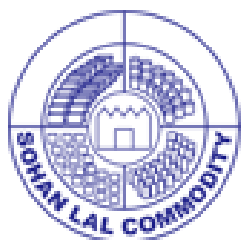


## **MEDIA COVERAGE REPORT**



**SOHAN LAL COMMODITY MANAGEMENT PVT. LTD**

## **Coverage Report**

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# AGRITECH INNOVATIONS WILL BE KEY TO FARMER UPLIFT

The agritech space in India is seeing healthy tailwinds due to government impetus on affordable innovations improving farmers' incomes, and on widespread digitalization drives across the agricultural value chain

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**A**griculture is the primary source of livelihood for about half of India's population, but the majority of the farmers still live on the edge of extreme uncertainty. The average agricultural land holding size also continues to shrink,

making it difficult to generate sufficient household income. Farmers in India are still heavily dependent on rainfed agriculture, which makes them highly exposed to climate variabilities. Besides adverse weather conditions, stiff competition from larger landowners,

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a limited access to markets, agritech services, and financing solutions, price fluctuations, debt pressure and crop failure, post-harvest losses due to inefficient supply chain, etc. make these smallholder farmers a vulnerable section of the population- so much so that farmer suicides account for more than 10% of all suicides in India.

#### Factors hurting Indian agriculture

Although India is among the top producers of several crops globally and the production of food grains has been increasing every year. Agriculture contributes around 20% of the country's GDP.

However, the agricultural yield (quantity of a crop produced per unit of land) is still lower in the case of most crops, as compared to other top producing countries such as China, Brazil, and the US. There is a clear lack of infrastructure in place across the agricultural value chain.

Among the issues that hurt the India's agricultural productivity are shrinking agricultural land holdings, heavy dependence on the monsoon, insufficient access to irrigation, soil sickness due to imbalanced application of soil nutrients, uneven access to modern technology across the agricultural value chain, rising post-harvest losses, lack of access to formal agricultural credit, limited procurement of food grains by government agencies, and failure to provide remunerative prices to farmers, etc.

Considering the condition of these small and marginal farmers in mind, the government has realigned its interventions from production-centric approach to farmers' income-centric initiatives, with focus on better and new technological solutions.

#### Tech transforming agriculture and uplifting farmers

By plugging in the existing inefficiencies in the agricultural value chain, digitalization and smart technologies like AI/ML, IoT, Remote Sensing, Farm and Data Analytics, Aerial Image-based Analytics, Robotics, Automation, Blockchain, etc. can prove to be an enabler, and can create a win-win scenario for all the stakeholders in the agricultural value chain.

Sangeeta Bavi, Director, Startup Ecosystem, Microsoft India said, "Data-driven agriculture is the need of the hour to scale sustainable food production. Data is key in removing the information asymmetry and guesswork out of farming. Especially with climate change playing havoc with predictable weather patterns, smallholder farmers need data-backed insights that are relevant to them. Advance information on weather patterns can help farmers take

necessary precautions in mitigating adverse impact on crop yield."The need for data is not just limited to precision farming techniques. There are strong use cases of enhancing supply chain efficiency and simplifying market linkages too.

In a country where dryland agriculture occupies 68% of the cultivated area supporting 40% of the population, Genomics can play an important role in growing crops in arid lands and reduce the import burden significantly. Delhi University's Centre for Genetic Manipulation of Crop Plants has been using 'Omics' approach to understand factors affecting high yield of the crops across various species. It is using Lenovo DCG's HPC-based Genomics Optimization and Scalability Tool, GOAST which can process 1 whole genome in 5.5 hours, compared to 48 hours earlier and 1 exome in 4 minutes. Paritosh Kumar, Scientist, CGMCP said, "The latest genome sequencing techniques produce very large amounts of data, which requires enormous compute and memory capacity to handle large-scale processing and analysis. It will help us to breed more nutritious, more drought and disease-tolerant, high-yield plants to feed the world."

Extending the cellular Narrowband Internet of Things (NB-IoT) protocol for satellite communications for maximum affordability, Skylo brings real-time, affordable, and ubiquitous IoT connectivity to millions of machines, sensors, and devices, even in the most remote places on Earth. By enabling equipment owners to connect and share their heavy-duty machinery, Skylo helps to make the access to farming equipment affordable, and helps farmers to increase their productivity in turn.

To help the marginal farmers facing water scarcity, a mobile phone-based irrigation advisory called Provision of Advisory for Necessary Irrigation or 'PANI' was piloted in Uttar Pradesh in collaboration with the World Bank, the University of Washington, IIT Kanpur, Kritsnam Technologies and GeoKno. The field-specific ground information captured by the sensors helped improve farmers' crop productivity and water usage.

Considering the rising labor costs and a shortage of labor in mind, students of Lovely Professional University (LPU) School of Agriculture have conceptualized and designed 'Flying Farmer', an affordable drone designed to solve two major agricultural issues faced by farmers – pesticide treatment and weed detection and can be exclusively deployed in farming and field survey. It estimates the nutrient content of the soil to aid production growth and reduce crop damage. The University will not file for a patent but instead, will open source the technology so that it can be inexpensively



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available to any farmer, anywhere.

Lack of transparency, credit histories, and hassles relating to contract enforcement are limiting financial inclusion among smallholder farmers. Ashish Anand, CEO, Whrrl said, "Agriculture is the one little-explored sector that blockchain has the potential to revolutionize. With transparency and shared control accessibility blockchain could bring fairness to agriculture finance. It enhances farm to fork traceability by facilitating information about the crop origin as well as the details of the producers. Blockchain also provides updated demand and supplier information to farmers allowing them to define their prices and sell accordingly in overseas markets."

Skymet, supported by Caspian Debt is scaling its digital platform to provide solutions for filling the gap between financial institutions and farmers. The platform can compute Farm Credit Score using farmers financial health, repayment capacity and cropping history making it easy for the financial institutions to underwrite loans for the farmers and can simultaneously inform the farmer regarding the credit limit. Skymet is already working with SBI/HDFC/ICICI banks in Madhya Pradesh and with District Credit Co-operative Bank of Sangli in Maharashtra disbursement of Kisan Credit Card loans/other

farmers loans within a short period of time.

"Modern farming is full of opportunities, and it addresses multiple alarming issues like saving the environment, providing employment, helping marginal farmers, cultivation of nutritional food and so on," said Rajshri Mishra, Co-Founder, NIRJA which aims to redefine agriculture via Hydroponic Farming- a method of growing plants in a soilless farming solution without the limitations of space and with complete control over the growing climate, making it more efficient and ecological than traditional methods of growing crops and plants. NIRJA introduced Hydroponic farming among the marginalised farmers in some drought-prone areas of Bundelkhand.

"India has a very ambitious target of doubling farmer's income by 2022. With 85% of farmers being small landowners owning less than 2 acres of land, farm diversification is a very effective way of increasing revenue for farmers. The Ready to Implement Micro farms can be started with very little space and investment and is not very labour intensive to implement. As the investment and space requirement is low, more smallholder farmers take this up in addition to the existing activities," said Prasanna Manogaran, Co-Founder, Aggromalin, which aims to help farmers diversify their portfolios into

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the animal husbandry and aquaculture segment with Ready to Implement Micro farms.

 (Read more such Agritech innovations on page 16-22)

#### **Agritech adoption and investments: India vs. Global**

One of the effective indicators in understanding the adoption of any new technology in any sector, is the 'Quantum of Investments / Deals' that flow into these technologies and sectors, said Prabhakar Puranik, Head of Engineering- Advance Technology Solutions, Robert Bosch Engineering & Business Solutions. "While adoption rate may not be directly proportional to the investments that flow in, we can get a sense of proportionality for Smart Technologies adoption in Agriculture by comparing such investment inflows in 2020 in India vis-à-vis other geographies. Research reports reveal that India Ranks third in adopting Smart Technologies in Agriculture (investments of about \$1.5Bn+) next only to USA and China (which, combined attract an investment of about \$18Bn). While across the globe, there was an uptick of 30%-50% in adoption rate in 2020; India in fact saw an adoption rate upwards of 70% in 2020," explained he.

"Another way of looking at the technology adoption is by differentiating the Agriculture Value Chain broadly into two buckets, 'Farm Related (Farm to Market)' and 'Market Related (Market to Fork)'. We can see that in advanced countries the adoption of smart technologies in both these areas Agriculture is almost equal (50:50). However, in India, it is in the 30:70 ratio," said Puranik.

#### **Agritech startups: A great enabler across Agriculture value chain**

Startups have remained at the forefront of India's Agritech revolution, with over 650+ Agritech firms in the ecosystem including various think tanks, research labs, government, incubators and accelerators. Startups engaged in helping farmers, enabling financing for them and enhancing farm mechanization have been attracting significant interest and funding from top investors. A report by Maple Capital Advisors forecasts that the investments from venture capital firms in agritech startups are

expected to exceed \$500 million (around Rs 3,730 crore) in the next two years. India's agritech sector attracted about \$245 million in investments from venture capital firms in 2019. The 'Supply chain tech and output market linkage' segment has emerged as the top funded segment, followed by the 'Precision agriculture and farm management' segment, says an analysis of the top deals by EY, which is, however, in sharp contrast to the global Agritech investment scenario. Globally the latter one leads the charge in terms of funding as well as the number of startups.

#### **The next frontier of growth for Agritech:**

Agritech market opportunity is spread across



multiple segments- while the supply chain tech and output market linkage remains the top funded segment, financial services, precision agriculture and farm management, and quality management and traceability could script the next leg of growth in India's

agritech story. As the agritech scene matures, we will see further consolidation of the startups across the segments and a rise of the diversified solution providers.

Favorable policies and a strong R&D support for the affordable technology innovations and adoption is also essential to drive the adoption of technologies across the agricultural value chain. Easy and simplified access to finance, farming advisory, robust internet connectivity, affordable technology solutions and mechanization options are also essential for the upliftment of the farmers. The agritech growth can be accelerated by building a robust ecosystem of multiple stakeholders of the agricultural value chain including technology providers, R&D institutions and the government.

"The lack of awareness and knowledge is also a major concern. The youth should be made aware of and armed with agricultural technology because the young generation is already using technology and is interested in it. They're interested in the traditional business of agriculture and grow in a tech-enabled way. So, the youth should be empowered to use technology as they are our future," suggested Sanjay Borkar and Santosh Shinde, Co-Founders, FarmERP.



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### Nikhil Das, Founder, Agdhi

The traditional method of detecting seed defects typically relies on manual inspection, grow-out tests (GOT) which is subjective, time consuming, labour intensive and involves higher costs. With SeedVision we have brought an AI-based seed phenotyping method which is a game changer in agriculture. Agdhi through ML, Computer Vision, Photometry and Radiometry offers efficient methods for seed classification and seed quality analysis in seconds. Additionally, Agdhi has also built one stop solution 'FarmerConnect' for all the farming needs. This farmer's community aims to strengthen the network and build new connections. FarmerConnect allows anyone to start with farming with state of the art technology and provides direction that has experience and knowledge. The company is also planning to launch a platform 'Planto' to identify the plant diseases with images of leaves and stem along with the suggestions and remedial actions.



helps farmers to increase their productivity in turn. Extending the cellular Narrowband Internet of Things (NB-IoT) protocol for satellite communications for maximum affordability, Skylo's solution has become disruptively affordable- costing 95% less than traditional satellite connectivity.



### Harsh Agrawal & Nikita Tiwari, Co-Founders, NEERx

NEERx has worked with ISRO and designed smart sensor for hydrology and land application named "SHOOL". It collects crucial soil and crop health parameters such as water and nutrient movement at multi depth, salinity, rain, heat stresses, local weather and crop progress. SHOOL Cloud data is modeled with crop phenological statistical models and AI-ML based algorithms to generate curated reports from sowing to harvest. The actionable insights help manage soil-water balance calendar, nutrient application schedule and crop growth metrics at micro as well as governance level. SHOOL has provided alternative to costly foreign based solutions whereby the cost to consumer is considerably less than most of its foreign and Indian counterparts. Determined by crop type, land topology and region, the sensors are planted in the field and the data gathered is displayed on a mobile app.



### Angira Agrawal, COO, Skylo

Skylo brings real-time, affordable, and ubiquitous IoT connectivity to millions of machines, sensors, and devices, even in the most remote places on Earth. This allows farmers to optimize operations by sending and receiving real-time data about growing conditions such as air temperature, moisture level or soil pH. The data can inform watering schedules, fertilizer needs, and growth cycles, resulting in lower energy costs, less water usage, and healthier crops. We also support emerging business models for equipment sharing- "tractor sharing," for instance. By enabling equipment owners to connect and share their heavy-duty machinery, Skylo helps to make the access to farming equipment affordable, and



### Mallikarjun Kukunuri, CEO, Niruthi

Niruthi provides farm-level insights needed by farmers, input and commodity markets, financial institutions, insurance companies and government agencies. By bringing together data from different sources such as satellites, weather



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stations, drones, and Internet of Things (IoT) as well as farm-level data collection through CropSnap mobile apps—to one single data technology platform, it can provide a model of climate-risks and forecast crop yields. Niruthi monitors and manages risk at the farm level using an array of tools and technologies for integrating data to turn mobile images into geolocated information about cropping patterns, crop condition, and crop yields. Our technology reduces the cost of field surveys because we use a smart sampling technique utilizing wall-to-wall satellite data which reduces the number of samples required for accurate estimation of area and yield and hence reduce the cost of conducting the sampling itself.



#### **Sandeep Karnati, Co-Founder & CTO, KIOT Innovations**

IoT solutions can be of a great help to the farmers, as it can add various sensors and communication modules within the farming process. Companies these days are trying to develop affordable sensors that help understand the soil's behavior, alerting the farmer only when a particular 'nutrient' is required at a specific time. The image processing technology is another IoT technology that can be used for analyzing acres on land within minutes. Understanding the fact the internet is the most common issue faced in rural areas, IoT devices these days can be operated without the internet. Communication mediums such as LoRa (Long Range wireless radio-frequency), sensors deployed with mesh protocol with a central gateway and other communication mediums help act as a substitute for the internet. Especially with mesh protocol, you can connect various farms or crops within one gateway.



#### **K. Sri Harsha, Founder, Kritsnam**

Kritsnam Technologies is a company in the field of IoT with focus on cost-effective and data-driven water

resource management solutions and empower farmers with precision irrigation. Indian agriculture dominated by marginal farmers is suffering a significant productivity loss due to changing and unpredictable weather conditions, and irregularity in water

supply. We develop IoT-based instruments that can monitor water quantity and quality in real time. Using these technologies, we started building applications in the field of irrigation management both on the farmers' side and also on the irrigation departments' side. Using the satellite data from NASA and weather forecasts, we also built a Provision of Advisory for Necessary Irrigation or 'PANI' in collaboration with the World Bank, the university of Washington, IIT Kanpur, Kritsnam technologies and GeoKno. the field-specific ground information captured by the sensors helped improve farmers' crop productivity and water usage.



#### **Sanjay Borkar & Santosh Shinde, Co-Founders, FarmERP**

Data-driven agriculture and agribusiness is a future for almost all stakeholders in Agriculture. Smart agriculture helps in mapping and tracing the entire process, from pre-sowing to harvesting, procurement, and sales, to traceability. Using the latest technology like AI, ML, IoT will improve productivity and make agriculture cost-efficient too. It could also help mitigate climate risks making agriculture more predictable and sustainable. When the number of people using smart technologies in agriculture will increase, the cost will go down and the adoption rate will increase. We have been promoting digital, smart and data-driven farming through our smart and innovative technology offerings - FarmERP and FarmGYAN. The smart and comprehensive multi-lingual agriculture





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management platform has been widely used globally for farm, farmer, procurement, processing, supply chain and financial data management and analysis.



### Om Routray, VP- Marketing, SourceTrace

SourceTrace is a global leader in providing digital solutions to agriculture and food businesses. We enable full visibility into the agricultural and food value chain, with touch points across every stage – from farm to retail. Our SaaS solution and agri value chain management software make farming sustainable, supply chains efficient and bring transparency and traceability into food trade across 32 countries. We work with agri-importers or a cooperative which is working with a large base of farmers and help them monitor the farm and make an estimate of the crop yield by digitizing all the data in a farmer profile, by geo tagging his farm, putting his historical record, soil test report, etc. We also help them in carrying out farmer training programs. All of these solutions are high demand in international markets but we are also seeing a gradual rise in domestic markets too.



### Sandeep Raju, Co-Founder & Board Member, Samaaru India

Like with all adopters of technology, we see farmers who are enthusiastic early adopters as well as those who are conservative followers. This hinges on the business case for a farmer – adoption is high wherever we can establish a strong correlation with productivity and quality which in turn leads to higher incomes. We have a long track record in applying deep handholding models with our farmers and are ramping up the use of precision farming techniques as well as data-driven agriculture. From our experience, thanks

to smartphone penetration, a substantial number of farmers are indeed tech-savvy in the context of their professional and personal needs. We prefer a blended approach with a combination of hi-touch and hi-tech – our partner network has a key role to play in supporting our farmers via an assisted tech model.



### Taranjeet Singh Bhamra, Founder & CEO, AgNext

To solve the problem of quality, accelerate transactions, and build trust in every intersection between the buyer and the seller, AgNext has created Qualix for rapid commodity assessment solutions across the food and agri value chains. It's like an MRI for food with the ability to do instant on-field analysis for the Grains and Spices in less than 30 seconds. Qualix analyses every aspect of food i.e. physical, chemical, and ambient using computer vision, spectroscopy, and IoT-based technologies for food quality monitoring. With the right technology in place, farmers can obtain accurate prices for their produce and greater incentive to improve their farm practices for better quality crops. For businesses, this technology helps save money and increase profitability, because now they know what they're paying for. Finally, for consumers, we ensure quality by accurately ascertaining whether there are adulterants or not.



### Rajendra Lora & Chandrakanta Sahu, Co-Founders, FreshoKartz

FreshoKartz aims to integrate farms, farmers, vendors, traders, and customers on a common platform. Apart from subscription-based soil data-based crop and fertiliser recommendations, Freshokartz sells and delivers agri inputs, quality seeds through its distribution centers and even to farmers' doorsteps. It even provides services such as

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agri-machineries, farmers' loans through its partner network. Once the crop is ready, we have a network of 100-plus buyers who are buying through our network comprising around 1,25,000 farmers in the state of Rajasthan. On the basis of the farm-level data and estimate on crop yields, we can connect buyers with the farmers before harvesting. Through the overall process FreshoKartz claims to help farmers to save at least 20-30% on the input cost, or by increasing the yield by proper usage of agri inputs and the advisory services.



#### **Anilkumar SG, Founder & CEO, Samunnati**

Today, there is increasing awareness in the farming community regarding IoT-enabled sensors, modern soil and water management systems, digital tools, such as precision tools, apps, AI, digital platforms providing market linkage and information flow, etc. However, there is a clear need to bring together all the stakeholders in the agri ecosystem on a single, unified platform. To empower farmers to reap the benefits of digitalisation, we announced Agri Elevate, a first-of-its-kind ecosystem platform offering services across the value chain to FPOs and Agri-Enterprises. It can be considered a dedicated search engine for agricultural services which helps FPOs and Agri-Enterprises to identify and gainfully engage with each other, nationally as well as regionally. The platform also offers a content repository which helps the stakeholders stay up to date on the latest developments in the agri ecosystem, so they can improve their businesses.



#### **Sateesh Nakula, Co-Founder & CEO, BigHaat**

Small and medium farmers need high quality inputs and advisory to reduce their cultivation cost, improve yield and earn better profitability. BigHaat offers a holistic experience to the farmers throughout the crop lifecycle by offering them with a highly personalized and data-led crop advisory in regional languages for better produce and higher profits. It has a built-in social media platform for

farmers to learn and share the knowledge, connect with fellow farmers and experts. By simply uploading a diseased plant picture, farmers can access our Crop Doctor feature for instant diagnosis and guidance. We are the first startup offering to provide plot level advisory to farmers by integrating with satellite remote sensing data, AI, ML and Cognitive Intelligence. We provide the advisory free of cost. We earn on each transaction on our platform from the vendors / suppliers.



#### **Sandeep Sabharwal, CEO, SLCM Group**

An enormous amount of food grains gets wasted due to archaic procurement, storage, and inefficient warehousing methods every year. Scientific Warehousing is the need of the hour and is one solution that can address the problem of wastage during storage to a large extent. Sohan Lal Commodity Management (SLCM) is a leading Agri-warehousing company has developed a patent-pending algorithm named "AGRI REACH" that combines a series of processes, audits, and real-time tracking of the facilities to give error-free results and deplete the risk of crop damage. It uses techniques like geo-fencing to real-time tracking, bar-coded storage receipts to avoid thefts/ pilferage, internal audits along with "Maker and Checker" policy at each level. We have also taken a lead towards paperless QC by developing an AI-based mobile app to assess crop quality within a minute with up to 90 per cent accuracy.



#### **Yogesh Patil, CEO, Skymet**

Skymet is scaling its existing digital platform to provide solutions for filling the gap between financial institutions and farmers. The idea behind this digital platform involves developing an application for



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farmers that provides farmers services involving crop recommendation, agro-advisory services and informs the farmer regarding the credit limit. Our AI based platform provides a holistic solution that increases farmers' adaptive capacity to climate associated risks.

The platform can compute Farm Credit Score using farmers financial health, repayment capacity and cropping history for the financial institutions for underwriting loans for the farmers. Use of remote sensing, Geo-tagging/fencing and overlaying cadastral maps over land records helps in land and crop identification, crop acreage and yield forecast. This will help detect false declarations of land ownership and crop type and unlock the potential of small and marginal farmers' across the agri-value chain.



**Prateep Basu, Co-Founder & CEO, SatSure**

SatSure's platform enables combining satellite imagery with weather, social and economic datasets, and uses the power of IoT, ML, analytics to generate timely, location specific actionable insights. We are providing SaaS solutions to the financial sector and public sector, assessing the underlying risk of the agriculture assets they chose, and monitoring that risk remotely over the entire lifecycle of their assets. These insights are made available to them to help them take decisions on how much to lend to some person, the claim validation, or for providing farming advisory, and weather forecasts to the farmers, thus helping in establishing a better connection between the financial service providers and the farmers they are lending to. The lenders can connect to our platform and see the crops that have been grown, monitor the farming conditions, etc.



**Anuj Sharma, Director, Earth Analytics India**

Earth Analytics India is making use of drone and satellite data for mitigating risks in agriculture and infrastructure and for better farm advisory services. In the monsoon season, cloud cover over major areas doesn't permit the use of optical satellite images. But unlike the Optical satellite imagery, Synthetic Aperture Radar (SAR) can overcome cloud coverage. Specialized in analyzing radar-based remote sensing data, Earth Analytics India is helping insurers and government stakeholders and farming aggregators to have a regular transparency about the crops grown. Our Crop Monitor product informs stakeholders about anomalies in the season such as floods or droughts, indicates the status of water and provides an overview of the main crop type pattern in the selected geographies. The technology can be used for crop identification, crop planting area statistics, soil analysis, crop yield estimations as well.



**Ashish Anand, CEO, Whrri**

Lack of transparency, credit histories, and hassles relating to contract enforcement are limiting financial inclusion among smallholder farmers. With transparency and shared control accessibility blockchain could bring fairness to the agriculture finance. Combining the benefits of IoT with Blockchain and Smart Contracts, Whrri is solving the recurring banking frauds issue in warehouse receipt finance vertical while simultaneously enabling digital lending in priority sector post-harvest financing to farmers/FPOs/traders. Farmers don't need to undergo paperwork also as they can apply for loans from our Anndhan mobile app, which helps to reduce the loan disbursement time from 10-12 days to a few minutes/hours. They can select the lender of their choice where they get more benefits from low interest rate, transparency, etc. Even warehouse service providers get benefited





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by reduced paperwork and improved operation efficiency.



#### **Sunoor Kaul, Co-Founder & Director, Origo Commodities**

Origo Commodities focusing on commodity supply chain and trade finance has comprehensive solutions for procurement, quality grading and certification, professional and scientific storage, preservation technology and structured financing to farmers, processors and traders through our warehousing network and banking partnerships. It has become the largest service provider to the government with its warehousing capability and network, and is also spearheading a technological transformation in agri supply chain financing through its flagship agri-trade finance platform, TradeFi. It has a unique product basket comprising both, customised end-to-end commodity management solutions as well as independent service offers. We have recently executed a Pass-Through Certificate (PTC) transaction that creates a new asset class of securitized commodities. For the first time in the country, institutional investors will have access to SEBI listed instruments financing agri commodities in WDRA (Warehousing Development and Regulatory Authority) accredited warehouses.



#### **Prasanna Manogaran, Co-Founder, Aggromalin**

India has a very ambitious target of doubling farmer's income by 2022. With 85% of farmers being small landowners owning less than 2 acres of land, farm diversification is a very effective way of increasing revenue for farmers. We aim to help farmers diversify their portfolios into the animal husbandry and aquaculture with our Ready to Implement Micro farms which can be



started with very little space and investment. It is not very labour intensive and reduces farm idle-time also. Aggromalin provides a multilingual app based platform called AQAI for farmers to procure live input materials. The platform, with a growing user base, provides rich data analytics to understand grower patterns and recommend micro-farm products to match with market demand. Aggromalin also develops IoT solutions to improve efficiency in brooding, hatching, and nursing techniques across Animal husbandry and Aquaculture.



#### **Vivek Sharma, MD- India, Lenovo DCG**

Genome sequencing through our Genomics Optimization And Scalability Tool (GOAST) has the potential to significantly accelerate research that could revolutionise food security and sustainable agriculture through successful plant breeding, including food protection and eliminating the rate of disease outbreaks by understanding the core issues of plant virology. We are now able to decode one whole plant genome in a mere 5.5 hours, compared to the previous industry average of 48 hours. This has enabled researchers to get faster insights and breed high-yielding crops that can withstand harsh weather conditions. Handling the scale and complexity of genomics analytics is only possible in HPC environments, which together with Machine Learning and AI are on their way to delivering on the promise of precision-based agriculture outcomes.



#### **Agendra Kumar, President, Esri India Technologies**

Geospatial infrastructure plays an integral role across the entire value chain in the agriculture sector. geographic information system (GIS) applications collectively improve the overall productivity and efficiency by helping effective management of the crop life cycle, irrigation, fertilizers, pests and diseases, agricultural produce and livestock. Advanced GIS capabilities like spatial modelling and predictive analysis using AI, ML, IoT and remote sensing provide enhanced situational awareness for

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accurate forecast of likely scenarios to mitigate, plan and respond, including the impact of natural disasters. GIS maps and analysis helps companies to insure crops at the right value and in case of disasters with the post-damage analysis and quick claim pay-outs.

With GIS, the supply chain from farm to table can be managed efficiently that minimises wastage. Geo-enabled digital transformation is the need of the hour to combat the multifaceted challenges faced by the agriculture sector.



**Prabhakar Puranik, Head of Engineering- Advance Technology Solutions, Robert Bosch Engineering & Business Solutions**

A way of looking at the technology adoption is by differentiating the agriculture value chain broadly into two buckets, "Farm Related (Farm to Market)" and "Market Related (Market to Fork)". We can see that in advanced countries the adoption of smart technologies in those two areas is almost equal (50:50). In India, the ratio stands at 30:70. However, the adoption of smart technologies in Indian agriculture sector looks to be on a steep upward trend. Some of the farm related challenges that can be solved by the application of smart tech are Farm Management, Farm Mechanization, Farm Digitization, Yield estimation, New Farming Practices, etc. Some of the market related challenges that can be solved are, Agribusiness Marketplaces, Logistics and Transport, Warehouse/Cold Storage Chain, Processing Technology, End to End Food Traceability.



**Sangeeta Bavi, Director- Startup Ecosystem, Microsoft India**

Through the Microsoft for Agritech Startups program, we are guiding startups through different growth stages and helping them become market-

ready with best-in-class tech and business enablement resources. Startups get access to Azure FarmBeats, which can help simplify aggregation of agricultural datasets across providers and generate actionable insights from AI/ML models. We have seen

strong use cases of enhancing supply chain efficiency and simplifying market linkages with the power of data in agritech startup solutions on the Microsoft cloud. Startups like CropData and SatSure are leveraging the power of Microsoft Azure and Azure FarmBeats in creating data-backed transparent agriculture models that generate more value to not just the farming community but for all stakeholders in the value chain. The program provides a shared platform for learning and innovation by bringing startups, corporates, governments, and VC firms together.



**Vaibhav Gawde, Head- Solution Engineering, Oracle India**

Indian Farmers Fertiliser Cooperative Limited (IFFCO), an Oracle customer chose to add a voice interface to its applications. To purchase fertilizers, farmers needed to travel to IFFCO outlets in the past (often without knowing if what they want to purchase is available in store or not), then wait in long queues at times, and look for a person who could help them complete necessary transactions in store. The farmers now can simply ask the digital assistant if there is enough inventory available before making a trip to the store and they can do it with minimal training. IFFCO has plans to add more language capabilities in due course and are now looking to extend this to farmers possibly integrating it with IFFCOBazar.in, to enable voice-activated order placement for quick and safe doorstep delivery, offering even more convenience to farmers.

