

# THE HINDU BusinessLine

## Big Data for the next green revolution

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A new call: Of technology-powered agriculture - Photo: M Srinath

*From precision agriculture to real-time price updates, advanced data analytics can help farmers usher in a new era in farming*

It is clear that the projected population growth and urbanisation rates will have dramatic impacts on food security across the world by 2050. The impacts are multi-sectoral and extend well beyond food into infrastructure, healthcare, and technology.

However, technology has the potential to re-shape these trends for the benefit of society. Technology is disrupting all areas of agricultural value chain, driving countless opportunities and challenges particularly around profitably feeding the 9.6 billion people on Earth by 2050.

At the same time, the growing demand for food and shifting food security needs are driving innovation in the resource space. World is now more inter-connected, spawning massive data and exploration of these data can help to drive decision making that can transform the farm source-to-consumer value chain. Agri-businesses are subject to numerous regulations and consumer requirements across their supply chain. Of the several touchpoints along the agri-value chain, each hold critical information that can help businesses make the most of their resources, provide greater transparency in their processes and protect consumers.

Big Data has the potential to add value across each touchpoints starting from selection of right agri-inputs, monitoring the soil moisture, tracking prices of markets, controlling irrigations, finding the right selling point and getting the right price.

### What data can do

Big-data businesses can analyse varieties of seeds across numerous fields, soil types, and climates. Similar to the way in which Google can identify flu outbreaks based on where web searches are originating, analysing crops across farms helps identify diseases that could ruin a potential harvest. The challenges and opportunities of data is immense in a country like India with 638,000 villages and 130 million farmers speaking around 800 languages with 140 million hectares of cultivable land under 127 agro climatic regions capable of supporting 3,000 different crops and one million varieties.

Self-driven vehicles can already drive themselves across fields using Global Positioning System (GPS) signals accurate to less than inch of error thus helping farmers plant more accurately, but the real potential is what happens when this data from thousands of tractors on thousands of farms is collected, grouped and analysed in real time.

Precision agriculture aids farmers in tailored and effective water management, helping in production, improving economic efficiency and minimising waste and environmental impact. Recent progress in Big Data and advanced analytics capabilities and agri-robotics such as aerial imagery, sensors, and sophisticated local weather forecasts can truly transform the agri-scape and thus holds promise for increasing global agricultural productivity over the next few decades.

### Right information

Farmers need accurate weather forecasts and accurate information on the inputs they can use. Optimising input factors (e.g., nutrients, irrigation, and pest control) can help protect natural resources. The use of granular data (for example, data for every 100 meter square of a field) and analytical capability to integrate various sources of information (such as weather, soil, and market prices) will help in increasing crop yield and optimising resource usage, lowering cost. Since,

climate change and extreme weather events will demand proactive measures to adapt or develop resiliency, Big Data can bring in the right information to take informed decisions.

Big Data and advanced analytics are streamlining food processing value chains by finding the core determinants of process performance, and taking action to continually improve the accuracy, quality and yield of production. Big Data is already being used for optimising production schedules based on supplier, customer, machine availability and cost constraints.

It can provide agri-business with greater visibility into supplier quality levels, and greater accuracy in predicting supplier performance over time. In India, every year 21 million tons of wheat is lost, primarily due to scare cold-storage centres and refrigerated vehicles, poor transportation facilities and unreliable electricity supply. Big Data has the potential of systematisation of demand forecasting thus reducing such losses.

### **Connecting the dots**

A trading platform for agricultural commodities that links small-scale producers to retailers and bulk purchasers via mobile phone messaging can help send up-to-date market prices via an app or SMS and connect farmers with buyers, offering collective bargaining opportunities for small and marginal farmers.

India should look at establishing a systematic mechanism to capture the data that could offer additional value-creating opportunities. In particular, rapid proliferation of mobile technologies in rural populations could let farmers in these areas to improve productivity based on decision made backed by better information grounded on Big Data. It also has the potential to change the agri-business models including revenue models, as businesses will have the opportunity to offer new products and services thus developing sustainable revenue streams.

Proliferation of data offers unprecedented opportunities to understand consumer needs and preferences of farmers, and to deliver tailored services and products for organisations that can make sense of this data.

Given all this, today is right time for agri-businesses to lead on defining what better practices on data use are available. There is need to formulate a business model wherein value can be captured from the scale of data being captured by different players in the agri-supply chain. Companies must act now to focus, simplify and standardise big data through an enterprise-wide data management strategy as Big Data poised to deliver the next revolution of farming.

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