RETHINKING TRADITIONAL
INDIAN FARMING APPROACHES

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Traditional Farming in India

Ten thousand years – that is just how old Indian agriculture is! Even today, India holds the second position in the world for agricultural production. And despite its declining contribution to the GDP, it is still the most important sector in the country and plays a key role in India's socio-economic activity. More than 65 percent of rural population is still engaged in agriculture.

However, traditionally, in India, agriculture has always been a subsistence activity, which means that most of the crops grown and livestock raised are to provide food to the farmer and his family. This type of agriculture leaves little surplus for trade. Subsistence farms are small in size, not more than a few acres, the farm technology tends to be primitive and yields are low. Even with all the technological advancements that agriculture has witnessed, subsistence farms still exist. In this kind of agriculture, crops are dependent on rain, heat, fertility of the soil and other environmental conditions. Looking at it one way, it is the most natural kind of agriculture, in which the slash-and-burn technique is used, burning the crop stubbles after harvest and moving to a new patch. With no fertilizers used, the land regains its fertility. The farming system in India is very geography-specific, owing to its different climatic zones. Traditional agriculture also lacks relevant technical knowledge, uses low quality seeds and lacks credit for investment. More importantly, the scientific crop rotation system is not so well understood or appreciated in India.

As one of the oldest economic activities in India, agriculture is prone to change and evolution, triggered by changing weather patterns, socio-cultural practices and technological innovation. For a while, it seemed that commercial farming was the answer to increasing production and feeding a growing population. But it did so at the cost of quality of produce. The pesticides being used have caused harm to the environment, polluting land and water. Besides, it was a resource-inefficient system. For example, even after the introduction of irrigation systems, it is found that only 20-50 percent of the water reaches the crop, and the rest is lost in transit. Harvest and storage conditions are also poor, leading to crop wastage, to the tune of 7 percent of the annual grain production in India, according to a study. India also lacks sufficient cold storage and cold chain transportation.

The Need to Rethink Traditional Farming

One of the major issues that Indian agriculture suffers from is low yields. India's yield or productivity is lower than Brazil, Russia China and South Africa. India uses a maximum of its land for rice and wheat. But with a population growing at an average rate of 1.2 percent between 2010 and 2019 (as per State of the World Population 2019 Report), there is an acute need to rethink Indian agriculture in a way to make it predictable, one that minimizes crop losses, and at the same time, conserve environmental resources. The new path is sustainable agriculture.

The Way Forward

In order to make the agriculture sustainable and empower farmers in India, we need to make two key things to happen:

- Smallholder farmers need to be aggregated into meaningful groups
- Agriculture needs to be made data-driven by applying the latest technology

An average farmer in India holds a farm size of around 2.5 acres, and may either be illiterate or semi-literate. So, for any meaningful impact to be achieved in terms of accessing quality inputs at right prices, or demanding the right market price, or accessing

credit, it can work in favour of the farmers only if the operations are of a certain scale. Similarly, applying the latest technology solutions to small farmers also cannot be effective unless there is a certain scale. So there is a greater need and urgency to collectivize farmers in one way or the other – by forming farmer cooperatives/producer companies, or entering into contract farming relationships with buyers.

On the technology front, ubiquitous connectivity through mobile networks and the ability to collect and transmit data from the remote areas presents many new opportunities to build solutions for making agriculture more productive, predictable and sustainable. Starting with simple advisory messages sent via SMS from experts on sowing the right crops, to advising on fertilization, watering, crop protection and market alerts, farmer advisory services have evolved into a more comprehensive set of solutions with the capacity to manage the entire agriculture value chain involving all the actors for optimal production and marketability of the crops.

Remote Sensing combined with Artificial Intelligence and Machine Learning is a boon for agriculture in times of climate change, so that cultivation-related decisions can be made on a more real-time basis, depending on the prevailing climatic conditions and crop growth patterns, thus reducing the risk of crop loss and increasing yields. And then there are Unmanned Aerial Vehicles (UAV) which comes handy in noting important data like multi-spectral imagery, visual and thermal imagery, and humidity, the weather condition at a resolution up to even 1 cm/pixel, and air pressure.

Precision agriculture and data-driven agriculture is the way forward. Precision agriculture is a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. Precision agriculture defines decision support systems for the entire farm management, so that returns are optimal, and resources conserved. It is already being applied big time in many developed countries and market-oriented agri-food chains. It is being tested in many developing countries to see how data yields can be highest.

In fact, our solutions developed at SourceTrace originated from the need to rethink the approach to agriculture. Our digital solutions for the agriculture and allied sector range from farm management and supply chain management to traceability and certification. Further, in the more connected world that we inhabit today, we have solutions like market linkage which can directly connect farmers with potential buyers through a digital platform. This enables the farmer to have greater certainty over the sale of his produce and reduction of wastage. In turn, buyers can acquire the produce fresh. Monitoring and evaluation is another solution that helps oversee crop growth at every stage for proper planning of harvest and post-harvest processes. Our platform can also be integrated with financial institutions for credit risk assessments and crop-insurance-based decisions.

** CEO, SourceTrace*

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