**Futuristic trends in agriculture engineering & food science**

Bansi Sonpal

Department: Financial Management

Gandhinagar, Gujarat, India

September 15, 2022

Future trends of agriculture is as we see there is a growing increase in the AI/ML

Agriculture Technology Trends: Collaborating Tech with Agriculture

**ABSTRACT**

Let’s get amazed by technology’s superpower in the agriculture sector and witness how humankind has emerged from the tedious farm jobs to the exciting Agriculture Technology Trends in 2022.

The Prime Minister also released the 11th instalment of financial benefits under the **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)** scheme. This will enable the transfer of an amount of around 21,000 crore to more than 10 crore beneficiary farmer families.

**Table of Index**

**IoT in the Agriculture**

1. Regenerative Agriculture

2. Controlled Environment Agriculture

3. Conclusion

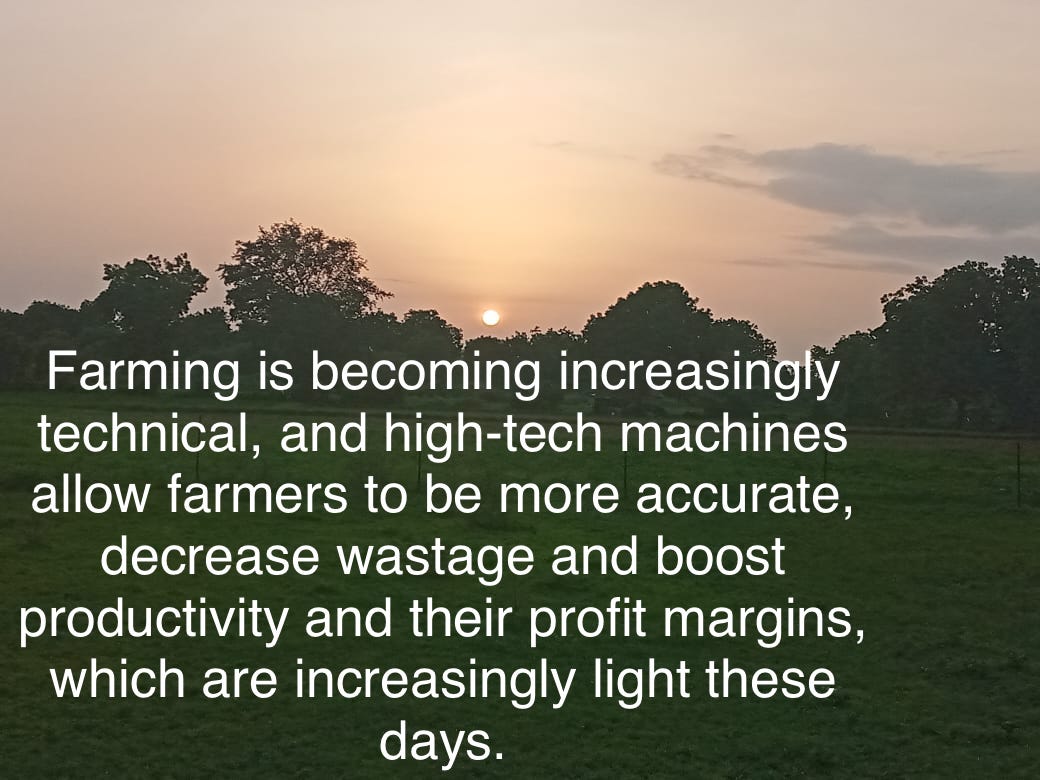
4. FAQs

**INTRODUCTION**

Modern day farming and agriculture are no longer associated with the arduous, sweat-inducing fieldwork of farmers and the patient, the slow growth process. With the advancement of agriculture trends 2022, the past decade has seen a thriving hike in agricultural yields, excellent examples of contemporary farming, and many more.  
In this blog, we will envision the latest technological trends in agriculture technology that have resulted in the welfare of farmers and global agriculture produce.

**Soil Health and Fertilizer:**

Healthy soil is vital for agricultural productivity. The disproportionate use of fertilisers has affected soil health. Hence, our government decided to combat it by educating farmers about the importance of soil health. A soil testing kit was developed for quick analysis of soil samples to optimise the use of fertilisers and was provided to 650 Krishi Vigyan Kendras (KVKs). More than 6 crore soil health cards have been printed and distributed to farmers.



Get the best AI/ML development services now

developers are

1. Predictive analytics for crop sustainability
2. Detection of crop infections and diseases
3. Prevention of wastage and meeting demands

The use cases of Agriculture Blockchain technology in real time are as below:

1. Agricultural insurance for farmers
2. E-commerce for agro-trades
3. Are you running short of time and resources?
4. Partner with us and go for IT staff augmentation as our proficient developers will bridge the gap and take you to your project goals.

**Automation:**

Intervention of drones, custom tractors, watering motors, harvesters, and more modern-technology blessings for agriculture automation.

**Regenerative Agriculture:**

Regenerative agriculture focuses attention on the rejuvenation and biodiversity of soil and soil distribution. It revives the soil for the upcoming cropping period.

Farmers undertake the following practices while implementing regenerative agriculture:

1. Reducing tillage
2. No-till farming
3. Crop rotation
4. Planting cover crops to retain soil fertility
5. These methods enable sequestration and make your fields act as a carbon-sink.

**Modern greenhouses:**

Modern greenhouses are increasing day by day.



**Increasing trend in horticultural output:**

The diversity of climate and soil characteristics enable the growth of a large variety of horticultural crops.

**Livestock farming technology:**

Nutritional technologies, genetics, digital technology, Sensor and data technology have advantages for the current livestock Industry. It can improve productivity of livestock by carefully detecting sick animals and intelligently recognising room for improvement.



(2) **Controlled Environment Agriculture**

These days, conventional farming practices aren’t easy to attain owing to climatic fluctuations and extremities. Also, with growing urbanization and a proportion hike, growing crops in populated cities isn’t favorable.

A solution to the above situation is controlled environment agriculture (CEA) where we subject the plants to a controlled amount of light, humidity, nutrients, and water. Some of the planned indoor settings available to attain CEA are vertical farming, indoor farming, greenhouses, etc.

A few new techniques are found to attain a balanced equilibrium for plants-aeroponics, hydroponics, aquaponics, and more.

A foundation stone has been laid for the National Institute of Bio-Technology at Ranchi, Jharkhand to promote technological research in the field of agri-bio technology. We have made provisions to establish two new centres of National Agriculture Research Institutes-one each in Assam and Jharkhand.

FAQs

1. What challenges is the agriculture industry facing in 2022?

The modern agriculture industry is facing issues such as pesticides in the cross-hair, slow recovery, and trading/money concerns.

2. What are the benefits of using technology in agriculture?

The major advantages of using technology in agriculture are increased crop productivity, diminished impact on the environment/ecosystems, minimal use of water, energy, pesticide to turn down food prices, reduced water pollution, etc.

3. Name famous companies using technology in the agriculture industry.

John Deere, Nature Sweet, Bowery, Plenty, Camposeven, etc. are using agricultural technology trends.

4. What are the modern farming methods?

Among the practises are intensive farming, sustainable agriculture, organic farming, and agribusiness.

5. Name some modern farming machinery.

Rotavator, Power Harrow, Ripper machine, Leveler, Combine harvester, and more.

6. Based on current developments, experts predict dramatic changes in agriculture by 2050.

These predictions come from experts who study food and farming trends. Here’s a look at what they think life on the farm will look like in 33 years.

**Food Demand Increases**

The two big drivers of food demand—population and income—are on the rise. The world’s population is expected to reach 9.1 billion people in 2050, up from 7.4 billion in 2016. Farmers globally must increase food production 70 percent compared to 2007 levels to meet the needs of the larger population, according to a report from the Food and Agriculture Organization of the United Nations.

Also driving food demand is an increase in global income levels, especially those in developing countries. As a result, these countries will be able to expand their diets with more protein.

“As incomes rise, consumer preference moves from wheat and grains to legumes, and then to meat, including chicken, pork and beef,” says David Widmar, Purdue University ag economist.

A different trend is emerging in highly developed countries with more health-conscious populations. The focus on starch-based crops like corn will shift to more plant-based proteins like soybeans and other legumes, says Derek Norman, head of Corporate Venture Capital at Syngenta Ventures, which helps support other companies that share its vision of producing more crops with fewer resources.



**Consolidation Accelerates**

When older growers exit the business, there are fewer younger growers to replace them. As a result, farm consolidation will be significant and quick. The consolidation will change farm dynamics to larger, more managerial complexities.

Farming will go “from a one-man show to something resembling a medium- to large-size business,” he says. “As a farmer, it will be very complicated, with a mix of multigenerational family members and hired employees.”

**High-Tech Solutions Evolve**

Farm consolidation will drive the need for more outside labor. Expect high-tech solutions like robotics to come to the rescue.

Already, dairy farmers use robotic milkers as a substitute for labor, and farm equipment manufacturers are testing prototypes of robotic tractors and sprayers to handle fieldwork without human drivers.

The leap from prototype to commercial operation of robotic machinery may be short. Many new machines are currently equipped with the electronics to control operations with very little human interaction. However, the legal and regulatory issues surrounding robots must be bridged first.

With its regulations already in place, drone technology is poised for a boom in farm usage. In the next 10 years, the agricultural drone industry will generate 100,000 jobs in the U.S. and $82 billion in economic activity, according to a Bank of America Merrill Lynch Global Research report. Potential use of on-farm drones by 2050 is huge, from imagery and product application to transporting supplies and jobs not yet imagined.

As farming relies more on complex equipment with lots of electronics, data collection will play an increasingly larger role in farm management.

**Gene Editing Booms**

“By 2050, there will be gene-edited crops, and it will trigger a much wider variety of crops being grown,” says Norman.

Experts anticipate major changes in the #ag industry over the next 30 years.

**By-the-Plant Crop Management**

Water availability, environmental impacts and soil health will continue to challenge growers in the future. But new technologies will help them deal with these issues more efficiently.

**A Clue to the Future**

While predictions can shed light on the future, we are still 33 years away from 2050. A whole new generation of growers, who are not yet born, will be farming midcentury, and much will happen between now and then that we cannot predict.

But if the past is a clue to the future, U.S. growers will continue to seek better ways to produce crops by embracing innovation.

1 “Global Agriculture Towards 2050”

2 “Farm Demographics—U.S. Farmers by Gender, Age, Race, Ethnicity, and More”

**Biggest Trends That Will Shape The Agriculture Industry**

IoT, Machine Learning and Digital Twin – the three technologies that are at the center of every industry’s “hype” circle. But is it all just hype, or do these concepts truly have something foundational to offer? What are the best implementations these technologies have to offer for the agriculture industry? These questions are bound to be answered as time goes by, but the pressure of a rising population and their demands for more food have to be addressed, or we will soon face one of the biggest potential problems that have ever faced humanity – lack of food and resources. In today’s article, we are going to talk about how these 3 concepts can contribute to the average farmer’s workflow and what will be the future trends in farming that will be created by these concepts.

Millennials – The Biggest Innovators Driving The Adoption of Technology

Most people are aware that the age of the average farmer tends to extend towards the end of the spectrum (around 50 to 58 years), but we can see that the average trend that involves farming and millennials is starting to grow as they consist of more than 8% of farmers in the US and the numbers are growing. Some expert agronomists believe that millennials will drive the agriculture industry forward and help it incorporate the newest emerging innovations we hear about all the time, namely the Internet of Things. Since the overall amount of knowledge about technology and its uses is sparse in the circle of the older demographics, we must encourage the youth to participate and take interest in professional farming as this will help bridge the gap between innovation and one of the oldest industries out there. Moreover, with the constant and continuous investments in AgTech, this becomes a great opportunity to make farming an attractive and sensible choice for the young generation.

**The Impact of Precision Ag Technology**

Young millennials who are effectively introduced to farming can put their focus and use their good understanding on technology to help precision agriculture develop itself. One of the biggest trends that are seen thus far is the implementation of automatic machinery that serves mainly two purposes – reduce manual workload and increase efficiency by automating crucial farming processes. The kind of knowledge we have now cannot be successfully utilized due to the simple fact that precision Ag hasn’t reached the stage of full maturity and mass adoption yet – millennials can help solve this. If precision agriculture will reach the stage of mass adoption, the Internet of Things (IoT) will be the main trend that will pave us the way towards successfully increasing food production, whilst reducing field sizes and the negative impact to the environment at the same time.

The Biggest Trends That Will Impact Food Production – The Internet of Things

Besides fully automating the most labor-intensive processes we have in agriculture such as planting and harvesting, IoT will open new doors to opportunities that will involve effortless crop health monitoring, plant maintenance and the ability to make the produce disease-proof. Technology that will be capable of achieving these objectives is estimated to be worth billions of dollars, thus the trend of merging IoT and farming is quite apparent.

Some seed treatment offers are separately registered products applied to the seed as a combined slurry.

To feed the growing global population, estimates suggest we’ll have to increase food production by as much as 68 percent by 2050. And that’s not the only challenge; there’s also the fact that the middle-class population is growing, which generally brings with it increased demand for meat over grains, legumes, and wheat. Satisfying this demand for more food – and, most likely, more meat – presents a huge challenge for our already struggling planet, especially when you consider that the food system accounts for 26 percent of total global greenhouse gas emissions. (Agriculture, forestry, and land use make up 18.4 percent of this, while the rest is down to things like packaging, refrigeration, and transport.)

**Trend 1: Reimagining farming methods**

Embracing new farming methods could help the agriculture industry reduce its environmental impact while still increasing productivity. While previous evolutions in farming have largely been driven by mechanical improvements (namely, bigger, better machinery) or genetic advances (better seed, more effective fertilizers, etc.), the next big transformation is being driven by digital tools. For example, we have:

· Automation – including the use of robots, drones, and autonomous tractors to make farming more efficient.

· Precision farming – which involves applying irrigation, fertilizers, and pesticides at variable rates, depending on the needs of crops, rather than uniformly applying them at set times, quantities, and frequencies.

A good example of precision farming comes from a collaboration between Israeli company Phytech and Swiss agrichemical company Syngenta. Together, they have developed a monitoring system that includes plant growth sensors and soil moisture sensors to help farmers continually monitor crop growth and soil health and take action when and where it’s needed.

Other key trends to watch in farming methods include:

· More localized, urban farming – i.e., producing food closer to the people who need it, thereby reducing food miles.

· Vertical farming (the practice of growing crops in vertical layers) and hydroponics (growing plants in nutrient-rich water) – are both methods that generally use less water, soil, and space than traditional field farming methods. If this sounds niche, think again; the world’s largest vertical farm, located in Newark, New Jersey, shows that vertical farming can be done on a huge scale and with impressive results. Creators AeroFarm say the vertical farm is 390 times more productive per square foot than a field farm.

**India as loyal Consumer of this spice**

Despite not being a producer of Asafoetida (Hing), India consumes 40 percent of world's total production each year. So far Hing is produced only in Afghanistan, Turkmenistan, Baluchistan, Iran and Iraq. India imports near about 1000-1200 MT of asafoetida annually. During 2015-16, India imported 1199 MT of asafoetida valued at Rs 527.42 crores. After processing the raw product, India exported 885 MT of asafoetida valued at Rs 46.27 crores during the same period.

**The Institute of Teaching & Research in Ayurveda**

Established in 1967, Institute of Teaching & Research in Ayurveda or Gujarat Ayurved University is the first university to offer education and training in the field of Ayurveda across the world. The institution was formed by an act approved by Gujarat State legislative Assembly in the year 1965. Located in Jamnagar city of Gujarat, the university is devoted to Ayurvedic studies and Research and is administratively associated with the Health Ministry at State and Centre level. This university is a self-governing institution supported by the Government of Gujarat State.

The university houses three wings and offers more than thirty-five different programs that include Yoga and Naturopathy. Moreover, it manages the college and institutes in the campus and awards certified degrees/diplomas in the relevant field. Also, it offers a full-time Bachelor of Ayurvedic Medicine and Surgery (BAMS) program for qualified overseas students. An International Centre for Ayurveda Studies is made to deal with issues related to the foreign students. In addition to this, the University has signed MoU with various national and international Institutions.

Other than this, the university houses a well-maintained library that holds a collection of over 30,000 books on a variety of subjects. It also contains a collection of manuscripts in diverse languages. The university has designed programs like ‘Ayurveda e-learning’ to sensitize modern medical researchers and scholars.

The institution boasts of its well-established research laboratories and animal homes. Every research that takes place in the university goes through the institutional ethical bodies for clinical and experimental studies. Also, the university is home to several herbal gardens that are used to teach and train students.

Apart from this, the university maintains hospitals equipped with contemporary facilities to offer better treatment to patients and clinical training to students and researchers. With its OPD facility, the university hospital attends a large number of patients to provide specialized Ayurvedic treatment like Kriya Kalpa, Panchakarma, etc. The hospital has qualified staff and experienced Ayurveda specialists who can treat diseases related to skin, neurological disorders, paralysis, immune-related disorders, arthritic problems and many more.

**Water experiments**

Water has various forms. The human body consists of 70% water. The water in our bodies stays in contact with the atmosphere around us. The main aim is to remain balanced in every situation.

Dr. Masaru Emoto of Japan has done research on water. He had made the first impression on the water by providing it with various forms of good thoughts and prayers. He then converted the water into crystalline form and examined it under a microscope. The water showed good crystals. Hence, it was observed that what one thinks and what one observes has a positive and negative impact on their body. The images of the crystal for of water formed as a result of the experiments are shown below.

If negative thoughts and bad words are used in front of the crystals, then the water crystals will also turn out bad, and by listening to rock songs, the water crystals will turn scattered. which can be seen in the images. Similarly, for plants, when they’re planted, if water is sprinkled after praying or after getting vibrated, they grow faster and of good quality.







**References**

Modi’s Mission: empowering farmers

www.narendramodi.in

Institute of teaching and Research in Ayurveda

www.forbes.com

www.greaterkashmir.com