

TECHNOLOGY IN THE AID OF FARMERS

1. Agritech Report 2022

❖ **CONTEXT:** FSG, a global consulting firm, has launched the Agritech Report 2022, “What’s next for Indian agri-tech? Emerging opportunities and the way forward for India’s agricultural technology sector”.

- This report presents the current state of Indian agri-tech in India. It highlights emerging opportunities in this field. It also recommends way forward

- Traditional agriculture companies to succeed across the agriculture value chain

- Agri-tech start-ups to address the stiff competition ahead

❖ **What are the key takeaways from the report?**

❖ **Agri-tech startups**

- Start-ups are driving India’s agri-tech innovations and investment story with significant private equity inflows.

- Start-ups will need an acute focus on profitability to survive an emerging ‘battle of platforms,’ as several of these players now compete for farmer attention. This situation will be exacerbated by a funding slump in the medium term amidst an overall slowdown in global investment activity.

- Innovative global start-ups need to be responsible for addressing systemic barriers and building the critical ecosystem required to scale the agri-carbon market.

❖ **Technology**

- While the first wave of Indian agri-tech focused on market linkages, several mature, late-stage start-ups are now becoming ‘full-stack’ platforms, including value-added services such as agri-fintech in their core offerings.

- The next wave of agri-tech growth in India will come from technological advancements in, and increased adoption of, sustainable inputs, digital in-farm solutions (such as farm management software, remote sensing and advisory, and farm automation), novel farming systems, traceability, and agri-carbon.

- Climate change has intensified the focus on agri-carbon innovations.

- Technology has irreversibly disrupted the traditional agricultural value chain – from how farmers access information and inputs to how they grow and sell their produce. Stronger need to adapt to this digital transformation of agriculture. Investments in in-farm innovations, including artificial intelligence (AI) and Internet of Things (IoT) solutions, robotics/drones, and farm management software, have been growing exponentially.

- The government is playing a key role in the continued mainstreaming of agri-tech in Indian agriculture, through supportive policies in each of these emerging categories.

❖ **Traditional Agriculture companies**

- The report highlights that while traditional agriculture companies lag behind in most categories, large agrochemical players benefit from in-house R&D and a greater investment capacity. They are therefore ahead in developing, producing, and marketing sustainable and specialized inputs such as bio-fertilizers and organic fertilizers.

- However, traditional agriculture companies focused on the upstream and midstream value chain, including in-farm mechanization solution providers, lag behind start-ups in most other agri-tech innovation categories.

Traditional agriculture companies must embrace technology to succeed.

- Whether they double down on their strengths, or expand into adjacencies, they will need to develop a few core digital capabilities such as data analytics and digital farmer networks.

❖ **Why agri-tech innovations are required?**

- Agriculture accounts for an estimated 43% of India’s employment. Despite its importance to India’s economic and social development, the sector is fraught with challenges.

- Indian farmers face increasing cost and margin pressures due to several operational issues and structural barriers, such as rising input and production costs, threats to sustainability due to climate change and intensive cultivation, labor shortage and limited mechanization, and a low share of the final price of produce.

- Agri-tech innovations can address many of these challenges by making better information and technology available to farmers. This will in turn provide opportunities to farmers improve their incomes and engage in more sustainable food production.

- India’s agri-tech advancements, if utilized correctly, present an excellent opportunity for sustainable and equitable growth, ensuring not only profitability for agribusinesses but also improved livelihoods for farmers.

❖ **Beyond this report**

- Globally, India is competing with the US and China in the agri-startup space. According to Agfunder, India witnessed an increase in funding from \$619 million in H1 2020 to \$2 billion in H1 2021, behind the US (\$9.5 billion) and China (\$4.5 billion).
- An Ernst & Young 2020 study pegs the Indian agritech market potential at \$24 billion by 2025, of which only 1 per cent has been captured so far.
- Currently, it is estimated that there are about 600 to 700 agritech startups in India operating at different levels of agri-value chains. Many of them use artificial intelligence (AI), machine learning (ML), internet of things (IoT), etc, to unlock the potential of big data for greater resource use efficiency, transparency and inclusiveness.
- The pandemic helped them catapult and the 2020 farm laws can give them a further boost by providing a legal framework to work with the farmers through FPOs, co-operatives and other collectives.
- ❖ **How some startups in the marketing space are empowering farmers, small agrifood operators, and giving consumers a better deal?**
- Ninjacart, Dehaat, and Crofarm (Otipy) are a few of the many startups that are redefining the agrifood marketplace. The novelty of startup-led value chain transformation is not limited to empowering farmers but also co-opting local grocery, mom-and-pop, and kirana stores as well as small agrifood businesses that are an integral part of the agrifood ecosystem.
- At the same time, the startup network is able to leverage the bigger front-end players who demand bulk quality produce and have challenges in directly linking with farmers. This is in contrast to the earlier organised retail (big box) wave that emerged in the mid-2000s, wherein the livelihood of the unorganised retailers and small businesses was perceived to be threatened.
- ❖ **How agritech startups have a growing footprint ?**
- Dehaat is present in Bihar, West Bengal, Odisha, and Uttar Pradesh, working with 6,50,000 farmers through 1,890 Dehaat Centres.
- Dehaat Ninjacart sources fresh produce from farms and supplies to retailers, restaurants, grocery and kirana stores, and small businesses and is operational in nearly 11 cities.
- With a farmer network of 10,000 plus, Crofarm has served more than 1 lakh consumers and 5,000 businesses.
- Otipy has emerged as one of the popular app-based platforms with nearly 2 lakh customers and more than 8.25 lakh mobile downloads. It currently works with 10,000-plus resellers in Delhi NCR and also present in UP, Gujarat, and Himachal Pradesh. About 70 per cent of the resellers are women.
- ❖ **How the agri-tech startups have had a demonstrated impacts?**
- Ninjacart reduced wastage to 4 per cent compared to up to 25 per cent in traditional chains through demand-driven harvest schedule. Logistics optimisation enabled delivery in less than 12 hours at one-third the cost in traditional chains. Farmers' net incomes are reported to have increased by 20 per cent.
- Dehaat has enabled up to 50 per cent increase in farmers' income as a result of savings in input costs, increased farm productivity, and better price discovery.
- ❖ **Terms**
- **Agri-tech:** Agricultural technology, or agri-tech, is the use of technology in agriculture based on agricultural science, agronomy, and agricultural engineering. Agri-tech innovations could be in the form of products, services, or applications, which aim to improve yield, efficiency, profitability, and sustainability of agricultural operations.
- **In-farm & novel farming solutions:** Innovations such as artificial intelligence (AI), Internet of Things (IoT), robotics, and data analytics that manage risks and improve farm productivity and quality, and novel farming solutions such as vertical farming and aquaculture.
- **Agri-fintech:** Agri-fintech, or fin-tech for farmers, includes digital financial products and services across the agriculture value chain, such as input credit, supply chain financing, and insurance.
- **Agri-carbon:** Agri-carbon includes regenerative farming and soil health practices (such as no-till farming and crop rotation) which can restore carbon in the soil, biomass for energy and feedstock, and the trade of carbon credits.

PRELIMS

1. NavIC

- ❖ **CONTEXT:** The Indian government is pushing smartphone makers to enable support for its NavIC navigation system in new devices sold in the country from next year, a move that has spooked the industry due to additional costs and tight time frame.
- ❖ **What is NavIC?**
- NavIC, or Navigation with Indian Constellation, is an independent stand-alone navigation satellite system developed by the Indian Space Research Organisation (ISRO).

- NavIC was originally approved in 2006 at a cost of \$174 million. It was expected to be completed by late 2011, but only became operational in 2018.
- NavIC consists of eight satellites and covers the whole of India's landmass and up to 1,500 km (930 miles) from its boundaries.
- Currently, NavIC's use is limited. It is being used in public vehicle tracking in India, for providing emergency warning alerts to fishermen venturing into the deep sea where there is no terrestrial network connectivity, and for tracking and providing information related to natural disasters.
- Enabling it in smartphones is the next step India is pushing for.

❖ **How does NavIC compare?**

- The main difference is the serviceable area covered by these systems. GPS caters to users across the globe and its satellites circle the earth twice a day, while NavIC is currently for use in India and adjacent areas.
- Like GPS, there are three more navigation systems that have global coverage – Galileo from the European Union, Russia-owned GLONASS and China's Beidou. QZSS, operated by Japan, is another regional navigation system covering Asia-Oceania region, with a focus on Japan.
- India's 2021 satellite navigation draft policy stated the government will work towards "expanding the coverage from regional to global" to ensure availability of NavIC signal in any part of the world.
- According to Indian Government NavIC is "as good as GPS of the United States in terms of position accuracy."

❖ **Why is India promoting NavIC?**

- NavIC is conceived with the aim of removing dependence on foreign satellite systems for navigation service requirements, particularly for "strategic sectors."
- Relying on systems like GPS and GLONASS may not always be reliable, as those are operated by the defence agencies of respective nations and it is possible that civilian services can be degraded or denied.
- "NavIC is an indigenous positioning system that is under Indian control. There is no risk of the service being withdrawn or denied in a given situation."
- India also wants to encourage its ministries to use NavIC applications to promote local industry engaged in developing indigenous NavIC-based solutions.

2. **Surjapuri and Bajjika dialects**

- ❖ **CONTEXT:** Bihar Chief Minister Nitish Kumar and Education Minister Prof Chandra Shekhar have asked the state education department to set up academies for the promotion of the Surjapuri and Bajjika dialects on the lines of the Hindi and Urdu academies. The education department will also set up an umbrella body to monitor the progress of all languages and dialects spoken in Bihar.

❖ **What are the Surjapuri and Bajjika dialects and where are they spoken?**

- Surjapuri is spoken mainly in Kishanganj and other parts of Seemanchal in northeastern Bihar, including the districts of Katihar, Purnia and Araria. The dialect, a mix of Bangla, Urdu, and Hindi, is also spoken in contiguous parts of West Bengal.
- The name Surjapuri comes from Surjapur pargana, which no longer exists. But there is a toll plaza called Surjapur between Purnia and Kishanganj.
- Although Surjapuri has nothing specifically to do with religion, the largest share of speakers of the language is made up of Surjapuri Muslims, who live mainly in Kishanganj, the district that has about 70 per cent Muslim population.
- About 80 per cent Muslims of Kishanganj are Surjapuri. Prominent leaders of the community include former MP Asrarul Haq Qasmi, the sitting Congress MP from Kishanganj Dr Mohammad Jawed, the head of the Bihar unit of Asaduddin Owaisi's AIMIM, Akhrarul Imam, and the former Union minister Rafiq Ahmad.
- Bajjika, one of five dialects spoken in Bihar, is a mix of Hindi and Maithili, and is spoken mainly in Vaishali, Muzaffarpur, and parts of Sitamarhi, Sheohar and Samastipur. Bajjika is not as well known as other dialects such as Bhojpuri and Maithili. Although the Bihar education department had considered teaching in local dialects up to Class 5 during the second Nitish Kumar government (2010-15), it did not come to fruition.



❖ **Why has the Bihar government announced this move at this stage?**

- Eight academies or functioning organisations — for Hindi, Urdu, Bhojpuri, Maithili, Angika, Magahi, Bangla, and South Indian languages — already exist in Bihar, and the government's decision on Bajjika and Surjapuri takes note of the two dialects that had been left out.

- The idea of setting up an umbrella organisation for Bihar's languages and dialects envisages a platform for academics, litterateurs, and officials to work together to promote literary writing, the upgradation of dictionaries, and the updating of the grammar of these dialects.
- While Maithili and Bhojpuri have made progress in fields of art, culture, and literature, Magahi, Angika, Bajjika and Surjapuri remain less-developed. The idea is to promote literary writing and conduct more research in Surjapuri and Bajjika as well, so that these dialects could be more popular.
- Legends like the poet Vidyapati and the dramatist and writer Bhikhari Thakur for Maithili and Bhojpuri respectively, other Bihar dialects have been struggling in terms of literary growth.
- 3. **NASA has deliberately crashed a spacecraft into an asteroid**
- ❖ **CONTEXT: NASA destroyed asteroid under DART mission. Just that the asteroid in question was not headed towards the earth, and there was no danger of any collision. What NASA managed to do was to let one of its spacecraft, sent specially for this purpose in 2021, crash itself against a small asteroid that was orbiting the Sun 11 million km away from Earth. By doing so, it hopes to change the orbit of the asteroid. How much it succeeded in its effort would become known only after measurements are done.**
- The 11 million km (about 300 times the distance to moon) is the closest that this asteroid, Dimorphos, comes to Earth while going around in its orbit. There was absolutely no danger that it would have come and collided with Earth. Recent collision was, therefore, just a technology demonstration, and an experiment to assess the capabilities to do such manoeuvres in future should a need arise.
- ❖ **Asteroid collision is real**
- Though there was no threat to Earth from this particular asteroid — and NASA says there is no real danger to Earth from asteroids for the next 100 years at least — asteroid collisions are real, and can happen. The dinosaurs, and most other life forms at that time, are known to have become extinct following an asteroid collision about million years ago.
- As recently as 2013, an asteroid entered the earth's atmosphere and exploded over Russia, causing injuries to hundreds of people, and causing widespread damage.
- Small asteroids — millions of them orbit the Sun — keep entering the earth's atmosphere fairly regularly, but burn out due to friction before they reach the surface. Some of them do drop to the surface but are not large enough to cause harm. The danger is from bigger asteroids. The one that destroyed the dinosaurs was about 10 km in width. According to NASA, an asteroid that big comes towards the Earth only in about 100 to 200 million years.
- But smaller ones are more frequent. There is a probability that an asteroid of the size of 25 metres would come once every 100 years. The one that exploded over Russia in 2013 was a little smaller, about 18 metres in size.
- The problem is that these calculations are based on asteroids that we know about, only about 26,000. There are many asteroids that we haven't discovered yet.
- ❖ **DART**
- Recent mission was called Double Asteroid Redirection Test, or DART. The targeted asteroid Dimorphos is actually a moon to a slightly larger asteroid called Didymos. While Didymos is 780 m at its widest, Dimorphos is about 160 metres. Dimorphos orbits around Didymos, and this two-body system go around the Sun.
- One of the reasons scientists chose to target Dimorphos was because of its relatively shorter orbit around Didymos. A deviation in this orbit was likely to be more noticeable, and thus easier to measure, if Didymos itself was targeted and an attempt was made to measure the change in its orbit around the Sun.
- The DART mission was launched in November 2021. The collision is likely to create a crater on Dimorphos. Whether the impact is able to make a noticeable alteration to its orbit would become known much later as telescopes around the world take measurements.
- 4. **JALDOOT App**
- ❖ **CONTEXT: Ministry of Rural Development has developed "JALDOOT App"**
- Ministry of Rural Development has developed "JALDOOT App" that will be used across the country to capture the water level of selected wells in a village.
- The Jaldoot app will enable Gram Rojgar Sahayak (GRS) to measure the water level of selected wells twice a year (pre-monsoon and post-monsoon). In every village, adequate number of measurement locations (2-3) shall need to be selected. These will be representative of the ground water level in that village.
- The app will facilitate panchayats with robust data, which can be further used for better planning of works.
- The ground water data could be utilised as part of the Gram Panchayat Development Plan (GPDP) and Mahatma Gandhi NREGA planning exercises. Further, the data can also be used for different kinds of research and other purposes.

- The country has taken many steps for improvement of water management both in the rural and urban areas, through watershed development, afforestation, water body development and renovation, rainwater harvesting and so on. However, withdrawal of ground water, as also utilization of surface water sources has reached critical levels in many parts of the country, resulting in significant depletion of water levels causing distress to the community, including farmers. Therefore measurement and observation of the levels of water tables across the country has become necessary.

ANSWER WRITING

Q. What are the four core qualities of a civil servant in the public administration and discuss their significance.

Introduction

The organisation, creation, and application of public policy for the benefit of the populace are all topics covered by the field of public administration. It works within a political framework to achieve the goals and objectives put forth by the political decision-makers. Hence, public administrators must conduct themselves in a manner that shows the public that they are trustworthy. This means adhering to core values for the safety and good of the public.

Significance of Four core Values

Professionalism

- Because of the public spotlight, being a public administrator carries a certain status. Therefore, public officials must constantly conduct themselves professionally. They could lose their reputation for everything they do. This is the first core principle, which calls for acceptable attire and treating others decently. Characteristics like accountability, dependability, efficiency, competence, objectivity, and confidence are included in professional values.

Ethics

- Ethical principles come next, followed by professional values. To gain the public's trust, public officials must conduct themselves honestly in all of their dealings. Being a person of integrity involves constantly being truthful and just, whether dealing with coworkers, friends, or customers. The public has access to whatever a public administrator does and says. Many public officials have had their careers destroyed after being exposed as lying to the public or engaging in unethical behaviour. Government officials must always act honourably and be aware of the law. They must refrain from abusing their power. You have to be prepared to deal with the public's relentless scrutiny if you wish to work as a public administrator.

Accountability

- The public hires public officials, and they are responsible for their words and deeds. Accountability and dependability are democratic principles. In essence, this means acting with professionalism at all times and keeping your word. Public trust cannot be established in the absence of accountability. Additionally, public officials must be as transparent as possible to guarantee that the public has access to information. Public officials should serve the public, not conceal information from them. The public's best interests must always be considered in all choices.

Objectivity

- The final public administration basic principle is objectivity. Respect, equality, and justice are requirements. Whether someone is wealthy or not, they deserve to be treated decently. The goal of a public administrator is to ensure that the laws passed do not violate anyone's rights in the face of widespread discrimination. Respect and equality should be accorded to all people.
- Any public official who disparages someone because of their political, cultural, or religious convictions is not functioning in a professional manner. Though opinions are acceptable, this fundamental principle of public administration states that everyone, regardless of socioeconomic standing, should be treated fairly.

Conclusion

Public service values are what shape a good public administrator. However, these core values are more than just beliefs and principles; they are motivations that incite actions. Public administrators must adhere to all the core values to earn public trust. You must learn them, too, if you want to be a public administrator.

MCQs

1. With reference to the Indian Regional Navigation Satellite System (IRNSS), consider the following statements:
 1. IRNSS has three satellites in geostationary and four satellites in geosynchronous orbits.
 2. IRNSS covers entire India and about 5500 sq. km beyond its borders.
 3. India will have its own satellite navigation system with full global coverage by the end of 2022.
 Which of the statements given above is/are correct?
 - a) 1 only
 - b) 1 and 2 only
 - c) 2 and 3 only
 - d) 1 and 3 only

2. With respect to Agriculture in India, which of the following statements is incorrect?
 - a) Agriculture Infrastructure Fund offers long term financial assistance for building infrastructure for post-harvest stage.
 - b) India is the top producer of milk, spices, tea, jute, and rice.**
 - c) The objective of Pradhan Mantri Kisan Sampada Yojana (PMKSY) is to supplement agriculture, modernize processing and decrease Agri-Waste.
 - d) Agriculture's contribution in the gross domestic product (GDP) has reduced to less than 20 per cent.
3. Consider the following statements:
 1. 36% of India's districts are classified as "overexploited" or "critical" by the Central Ground Water Authority (CGWA).
 2. CGWA was formed under the Environment (Protection) Act.
 3. India has the largest area under groundwater irrigation in the world.
 Which of the statements given above is/are correct?
 - a) 1 only
 - b) 2 and 3 only**
 - c) 2 only
 - d) 1 and 3 only
4. Which of the following statements relating to Indian agriculture is/are correct?
 1. India has the world's largest cropped area.
 2. Cropping pattern is dominated by cereal crop.
 3. The average size of an Indian farm holding is too small for several agricultural operations.
 Select the correct answer using the codes given below
 - a) 1 and 2 only
 - b) 1 and 3 only
 - c) 2 and 3 only**
 - d) 1, 2 and 3
5. Recently an app called JALDOOT has been launched by which of the following ministry or organization?
 - a) Ministry of Jalshakti
 - b) Ministry of Environment and climate change
 - c) Ministry of Rural Development**
 - d) Central Groundwater Authority
6. Consider the following pairs
 1. NavIC – India
 2. GPS – USA
 3. BeiDou- Japan
 4. GLONASS – Russia
 5. QZSS – China
 How many above pairs are incorrectly matched?
 - a) Only two pairs**
 - b) Only three pairs
 - c) Only four pairs
 - d) Only one pair
7. Dialects like “Surjapuri and Bajjika” recently mentioned in media are belongs to which of the following state?
 - a) Odisha
 - b) Punjab
 - c) Tamil Nadu
 - d) Bihar**
8. INS Sunayana and INS Tarkash recently seen in news are related to which of the following?
 - a) Submarines
 - b) Aircraft carriers
 - c) Patrolling Vassals**
 - d) Warships
9. “ELISA test” often mentioned in news is related to which of the following disease?
 - a) AIDS
 - b) Malaria
 - c) Polio
 - d) Dengue**
10. Recently Ayushman Bharat Digital Mission (ABDM) complete one year of its launch, With reference to ABDM, consider the following statements :
 1. Private and public hospitals must adopt it.
 2. As it aims to achieve universal health coverage, every citizen of India should be part of it ultimately.
 3. It has seamless portability across the country.
 Which of the statements given above is/are correct?
 - a) 1 and 2 only
 - b) 3 only**
 - c) 1 and 3 only
 - d) 1, 2 and 3