KPMG

India's emerging drone industry

A point of view

June 2022

Technology is disrupting the world and bringing change across industries and geographies. Both businesses and government organisations are leveraging digital innovations for operational efficacy and cost benefits. Unmanned Aerial Vehicles (UAV) or drones are one of such technologies, and its usage and application has expanded over the years to aid a larger ambit of sectors and applications.

Drones are unpiloted aircraft that are either remotely controlled by an operator or autonomously by onboard computers. Though at a nascent stage, drones are commonly used for military and commercial purposes, including surveillance, crop protection spraying, surveying construction projects, filmography, among others. With technological developments and ease of reform, the application of drones is expected to expand to other areas as well.

According to the Civil Aviation Ministry, as the global drone industry grows, the Indian drone industry is expected to reach INR120-150 billion (USD1.5-1.9 billion**) by 2026[1]. Currently, the use of drones is limited to mostly the infrastructure and agriculture sectors. However, an increasing number of drone applications coupled with favourable government regulations; a growing number of startups who are engaged in identifying new applications for drones are among the primary reasons why the drone industry is expected to continue to grow. This has also spurred mergers and acquisitions in the sector, with around 49 deals recorded in the last four years with an average EV/total income greater than 10x[2].

The burgeoning drone industry

Drones were initially launched in India as defence equipment but use cases for drones have developed over time. It now carries anything and everything, including vaccinations and medical supplies, as well as gadgets, food and groceries. The growth within the drone industry is primarily due to:

Increasing push from Government

The government of India (GOI) intends to make India a global drone hub by 2030[3], for which understated initiatives have been established.

- Liberalised policies to help individuals and businesses leverage drone technology
- The government of India plans to attract INR50 billion (USD6.7 billion*) investment in the next 3 years and create more than 10,000 jobs and encourage MSME investments by easing eligibility for the PLI scheme[2].

Increasing interest from startups and large corporates

- Drone startups in India are working to strengthen their technological abilities in order to compete with global competitors
- Between August 2021 and February 2022, India saw a 34.4 per cent growth in the number of drone startups, bringing the total to 221 startups[3]
- Corporates in India are also investing within the drone ecosystem.

Rising research and development effort

- Since 2015, nearly 37 patents around technologies, such as for propeller safety in automated aerial vehicles and hybrid aerial vehicles[4], have been filed by leading drone companies[2]
- The introduction of a liberalised drone regulation in 2021 and the government's support for local production under the PLI plan, which will offer a total incentive of INR1.2 billion (USD162 million*) to drone producers[5], are likely to result in more patents being submitted
- Development of custom-built and technologically advanced variants is expected to propel the adoption further.

1. The Coming of Age of the Indian Drone Industry, Invest India, February 2022
2. KPMG insights
3. Will India lead the drone delivery industry in the world?, Times of India, 17 May 2022
4. Amazon files patent application in India for tech related to drone safety, Business Standard, 02 June 2017
5. Series of reforms undertaken to promote Indian drone industry, PIB gov, 31 March 2022

Key areas of application[6,7]

Industrial sites

Drones are being employed by industries to simplify processes, increase efficiency and replace hazardous jobs. Also, using AI-enabled drones helps inspectors spot faults, allowing them to swiftly address the issue while ensuring road and bridge safety.

Infrastructure

As drones provide an aerial view, it is simpler to produce 3D models of the site, which aids in identifying areas that require attention. Drones also help in monitoring the construction work, planning surveys and mapping of properties.

Agriculture

Drones assist farmers in minimising time and increasing efficiency by monitoring crops and livestock, as well as spraying fertilisers and pesticides. The use of agriculture drones is on the rise and the government of India is engaged in promoting the same.

Healthcare

Time sensitivity is critical to healthcare industry. As a result, drones can be a viable option for providing faster, cheaper and more reliable delivery solutions for medicine and vaccines, as well as providing sanitisation services through spraying.

Energy and utilities

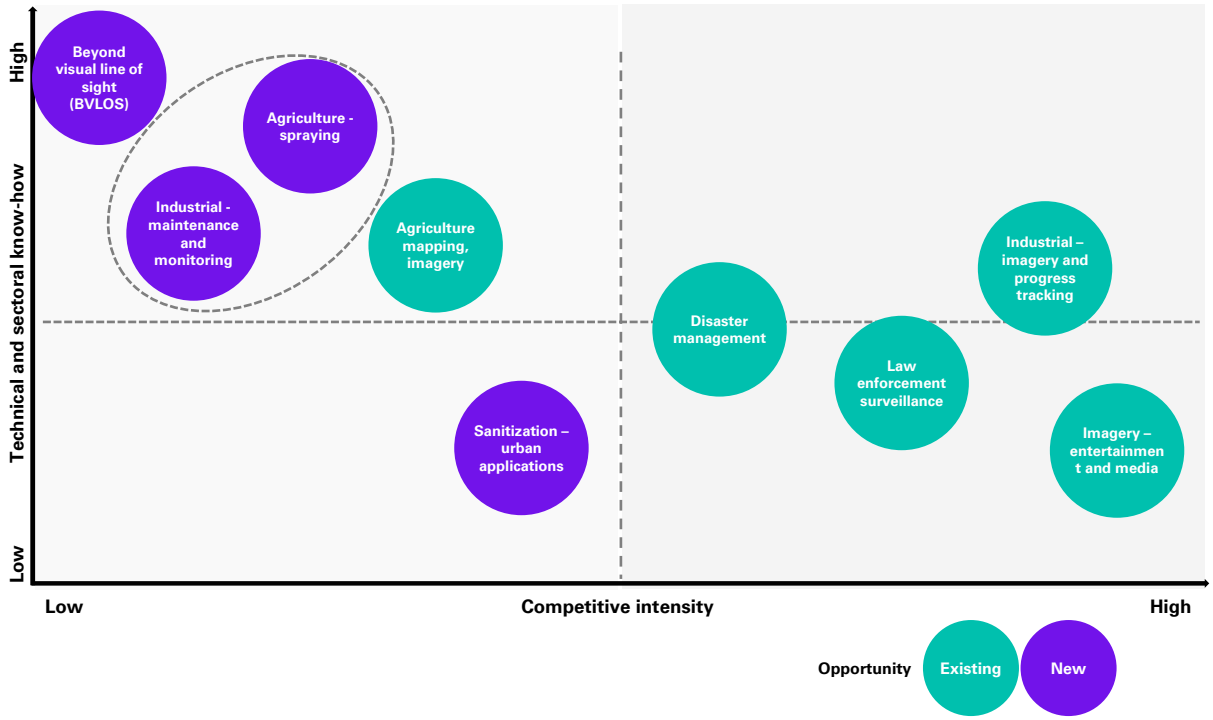
Drones equipped with a thermal scanner and RGB camera can collect data quickly and alert the user if an anomaly is detected. Further, the GOI has mandated the use of drones for mine inspections, which is expected to reduce thefts or audit mismatches by at least 20 per cent[6].

Application based barriers to entry for service providers

Drones are on the rise due to their ease of operation and cost-effectiveness. Areas of application demanding low technical skills is creating intense competition for drone service providers. On the contrary, areas demanding high sectoral expertise and technical know how are creating entry barriers for drone service providers.

For instance, agricultural spraying and industrial maintenance and monitoring are low-competitive applications that require high technical knowledge, whereas entertainment and media and law enforcement surveillance are high-competitive applications that need little technical understanding[7]:

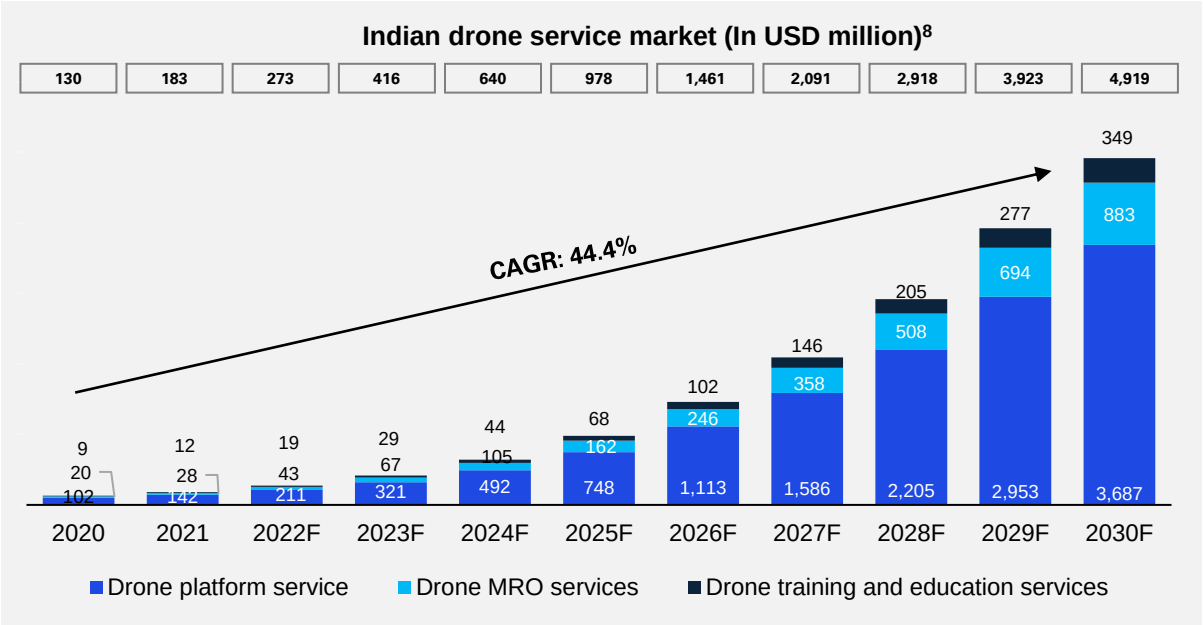
6. Exploration of drone industry – unlocking the full potential, Times of India, 12 May 2022
7. KPMG insights



An evolving concept: Drones-as-a-Service (DaaS)

The advent of drones-as-a-service is helping enterprises manage expenses. The price of an enterprise-level drone can be incredibly expensive, which is why most companies are opting for drones as a service.

The drone services market is divided into three categories - drone maintenance, repair and overhaul (MRO), drone platform services and drone training and education services. The drone service market in India was valued at USD130.4 million in 2020 and is expected to reach USD4,918.9 million by 2030, at a CAGR of 44.4 per cent[8]. Drone service market segment, drone MRO services and drone training and education services are predicted to grow at a CAGR of 46.8 per cent and 45.2 per cent, respectively, from 2020 to 2030. By 2030, the combined share of these two segments is expected to be 25 per cent[8].



8. Drone service market, Allied Market Research, June 2021

To seize the opportunity within the growing drone service market, several companies and startups have started offering services across industries.

- For instance, a Bengaluru-based DaaS service provider offers 'pay per use' drone services for agriculture, survey/ mapping, surveillance, inspection of manufacturing units, oil and natural gas industry, solar panels, windmills, and real-estate construction projects, which helps users reduce their initial investment, making it easier for them to adopt and benefit from this new technology
- Also, a Chennai-based DaaS startup is working to empower Indian farmers and the agriculture industry by deploying 6 lakh drones across 6 lakh villages in India by 2025
- Another instance, a Bengaluru-based startup is offering business information to assist businesses in scaling. Further, the firm plans to expand its drone data analytics-based offerings.

While drone as a service presents several opportunities, it also brings in a few constraints. A few of them are listed below[9]:

Opportunities

Revamped government regulatory framework

The government of India is pushing start-ups to facilitate drone-as-a-service, which enables a company to use a drone service provider for a variety of services without having to invest in drone equipment, software or pilots[10]

Technological advancement in drones

Drone technology isn't limited to delivery of goods or data collection; it can also be utilised to offer insights to businesses across industries through advance technology. Drone services have begun to grow into software solutions, from data acquisition to data processing and ultimately providing actionable insights from the processed data.

Constraints

Cybersecurity issues associated with drones

The rising use of drones across a variety of applications has increased the cybersecurity risk for its users. Drones are equipped with GPS and other technologies, making them a huge cybersecurity target for hijackers. Because of the cybersecurity risk associated with drones, the government has imposed prohibitions or restrictions on drone possession and imports

Limited operational bandwidth for drones

Drones are used in data-intensive applications such as surveying, mapping and data analytics, among others, which demand a high bandwidth connection for storing and communicating data. The limitations in creating a reliable broadband network limit the market's expansion.

9. Drone service market, Allied Market Research, June 2021
10. Everything you need to know about the drone-as-a-service model, Business Standard, 30 March 2022

Cost analysis: traditional techniques versus drones

Drones' potential to reduce costs while boosting the value of information acquired through these systems has been a key factor in encouraging drone use. Traditional working techniques that relied on occasionally faulty and time-consuming procedures can now be replaced with low-cost, information-rich drones[11].

Drone usage can drive significant cost efficiencies, mainly within the agriculture and infrastructure sectors, enabling mass adoption. The following table touches upon a few of the application areas with the cost saving details[12]

Areas	Existing process	Potential drones benefits	Saving details (approximate values)
Planning surveys and mapping	• Ground-based manual data collection • Manual analysis and single-point decision-making.	• Automated analysis and collaborative decision-making • 10x faster and 10000x more data points on a digitised base for better plans.	• **Existing cost:** INR10-12 thousand per sq. km • **Potential cost:** INR6 thousand per sq. km • **Cost Savings:** 45 per cent.
Construction monitoring	• Excel-based progress tracking without visual verification.	• Automated object recognition, counting and progress tracking on drone maps • 80 per cent faster and improved transparency and on-site governance.	• **Existing cost:** INR2.5 thousand per km for road construction survey • **Potential cost:** INR1.5 thousand per km • **Cost Savings:** 40 per cent.
Earthworks management	• Manual data collection and reporting • Paper-based volumetric tracking without visual verification.	• 30x faster data collection and 350x more data points than with traditional (Global navigation satellite system) GNSS survey • 4x faster turnaround and end to end tracking.	• **Time consumption:** 15-30 days for surveying 100-acre job site • **Time Benefits:** 20 mins to survey 100-acre job site • **Cost Savings:** 90 per cent.
Agriculture crop monitoring and spraying	• Manual applications – unsafe, in-efficient and limited access to skilled labor • Erroneous, single point-decision making.	• 10x faster turnaround, efficient and cost-saving • Automated analysis and collaborative decision making.	• **Existing cost:** INR1500-1800 per acre for spraying • **Potential cost:** INR300-400 per acre • **Cost Savings:** 0 per cent.
Industrial asset maintenance and sustainability	• Erroneous, unsafe, and infrequent manual inspections • Ad-hoc manual patrolling with no visual evidence.	• Automated diagnostics from safe and frequent aerial inspections • Real-time, centralised view of inaccessible and remote assets.	• **Existing cost:** INR90-100 thousand per chimney inspection using crane • **Potential cost:** INR50 thousand • **Cost Savings:** 50 per cent.

11. Make in India for Unmanned Aircraft Systems, FICCI, August 2019
12. KPMG insights

The global contrast

Countries all over the world are relaxing regulations on beyond visible line of sight (BVLOS) operations, which define the ease of operating an unmanned aircraft without a remote pilot while maintaining a visual line of sight on the UAVs. This is likely to further boost the demand for delivery drones[13].

Globally, countries such as the U.S. and China have created a favourable environment for companies to benefit from the applications of drones and their associated technologies and as a result, these markets have seen significant capital invested in their drone ecosystems and are driving innovation within the market[14].

China

China has a maximum 400-foot above-ground level limit, with UAS operators required to buy insurance for UAS covering liability for third parties on the ground. The airspeed of the UAS is limited to 100 kilometers per hour. Also, the UAS operators are required to record the flight data in a real-time online systems[15]. Leading UAS manufacturing companies based in China currently make up the majority of the global UAS market. And this is due to the rapid innovation, development of Unmanned Traffic Management and continuous government investment.

U.S.

The U.S. has also witnessed exponential growth in drone usage post 2015 due to liberalised government policies resulting in significant investments. The U.S. policies, which allow higher altitude flights at speeds no faster than 100 miles per hour, heavier payloads with few restrictions, and a streamlined online process[15], have resulted in positive performance in the American market. The U.S. has recorded more than 900 startups and big corporates within the drone industry. However, due to restrictions imposed on the U.S. armed drones, China has swooped in to take the lead in the military drone market, which the U.S. is trying to recapture[16].

All the above-mentioned factors are reflected in the amount of money invested in the industry. This capital is further reflected in the innovations driven by companies from these two countries.

India

The Drone Rules, 2021, have revamped the Indian drone ecosystem. Prior to this, old regulations and policies restricted the growth of the Indian drone industry. However, liberalised drone rules, the PLI Scheme, the Digital Sky platform and Drone Shakti have made doing business within the industry easier, leading to increased confidence and growth and, ultimately, catching up with other developed nations.

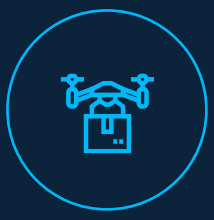
13. Will India lead the drone delivery industry in the world?, Times of India, 17 May 2022
14. Series of reforms undertaken to promote Indian drone industry, PIB gov, 31 March 2022
15. Make in India for Unmanned Aircraft Systems, FICCI, August 2019
16. China takes lead in military drone market, Asia Times, 31 December 2019

Government initiatives to enhance India's drone ecosystem

With the aim of making India a global drone hub by 2030, a total of 12 central ministries are involved in trying to boost the indigenous demand for drone services. This is likely to create demand for around 1 lakh drone pilots in the upcoming years[18]. The central government has implemented the following reform initiatives to promote India's emerging drone industry[17]:

Drone airspace map

In September 2021, the Indian Government opened 90 per cent of Indian airspace as a green zone for drones flying up to 400 feet.[17]



Drone import policy

The government announced in February 2022 that it had restricted the import of foreign drones while allowing the import of drone components.[17]

Production-linked incentive scheme

Under this initiative, the government will provide a total incentive span over three fiscal years, of INR1.2 billion (USD162 million*) to drone manufactures/industry.[17]

Drone (amendment) rules

In February 2022, the Indian government abolished the requirement for a drone pilot's licence.[17]

Drone shakti

The union government announced the Drone Shakti scheme in its 2022 budget statement, with the goal of facilitating and promoting drones as a service through companies.[19]

Agricultural drones monetary grant program

To promote the use of kisan drones, the GOI is providing financial incentives. For instance, Farmers Producers Organisations can receive a up to 75 per cent subsidy of the cost of an agricultural drone.[20]

17. Series of reforms undertaken to promote Indian drone industry, PIB gov, 31 March 2022
18. India will need around 1 lakh drone pilots in coming years: Jyotiraditya Scindia, Economic Times, 10 May 2022
19. Budget 2022: Drone Shakti, Invest India, February 2022;
20. Who will pay for the kisan drone?, Economic Times, 12 February 2022

Future outlook

In the recent years, the Indian government's Aatmanirbhar Bharat initiative has bolstered the domestic drone sector. Additionally, waivers for pilot permits, reduced and simplified procedures, the creation of new drone corridors, incentives for local manufacturers and partnerships with corporations are likely to allow drones to transform the scenario across numerous industries in the country. And this is in line with the government's intention to develop not just drone manufacturing, but also the booming drone services industry[21].

In the long run, companies will need to build a strong working relationship with the government in order to be more compliant with tender eligibility criteria and increase their chances of winning the same. Access to a strong network of pilots across the country is expected to play a vital role in winning a tender or a service client. Also, a strategic technical or commercial tie-up for joint development of products is expected to provide a competitive edge.

India is a major importer of drones, accounting for 22.5 per cent of total global drone imports[22]. Though most drones are employed for military activities, commercial drones are growing increasingly popular. With a total value of over USD900 million[22], the commercial end-use drone sector is predicted to exceed the military industry. And by 2025, India is forecasted to be the world's third-largest drone market[22].

It is anticipated that in coming years, in addition to facilitating a thriving manufacturing industry, a surge in demand for drones across various sectors, such as agriculture, defence, retail and e-commerce India, will lead to a rise in investment by corporations and startups. This, collectively, will help India to be a one-stop destination for many international investors operating in the drone industry.

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21. The Coming of Age of the Indian Drone Industry, Invest India, February 2022
22. Exploration of drone industry – unlocking the full potential, Times of India, 12 May 2022

Notes:
1. *Converted amount using the 2021 average exchange rate of INR73.9
2. **Converted amount using the 2022 average exchange rate of INR75.6

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