

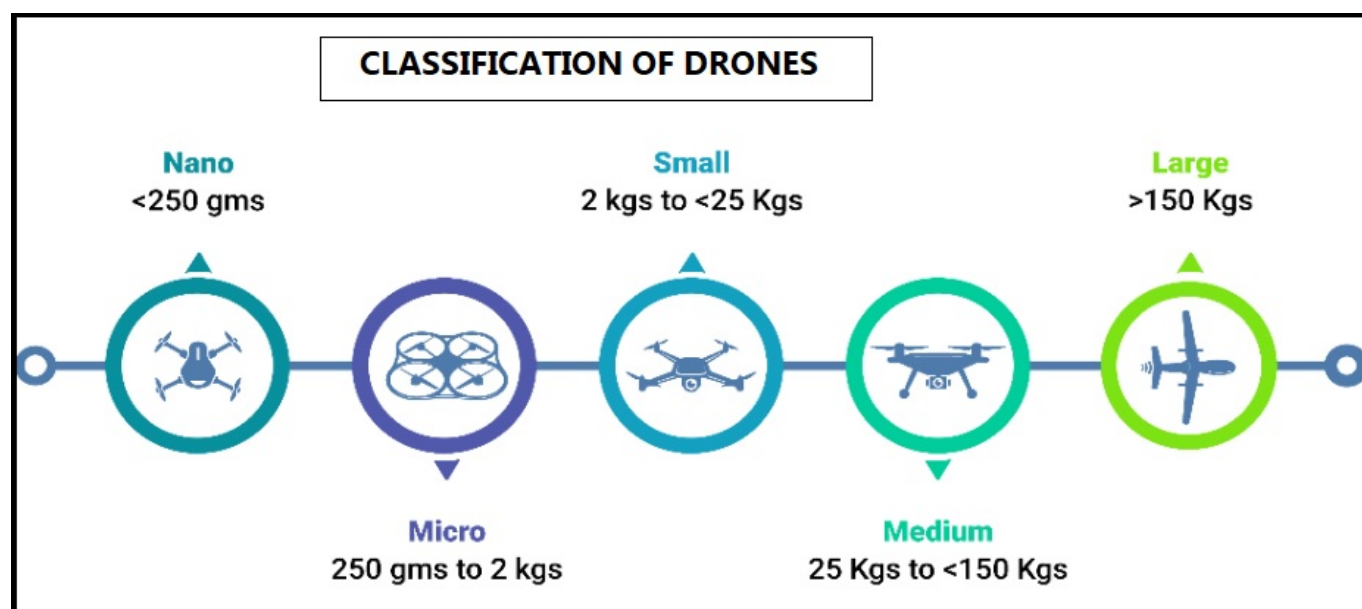
Issues with Nano Drones

Why in news?

The emergence of Nano and micro drones and compact unmanned aerial vehicles (UAVs) with advanced capabilities, introduce fresh security challenges.

What are drones?

- **Drone**- It means an aircraft that can *operate autonomously or remotely* without a pilot on board.
- India reported 79 cases of using drones for weapon delivery 2020, 109 in 2021 and 266 in 2022.



Provisions under Drone (Amendment) Rules 2022

- **Criteria**- To operate a drone legally, the criteria set by the Civil Aviation Ministry and the Directorate General of Civil Aviation must be adhered to.
- **Exception**- Nano/micro category drones for non-commercial use.
- All drone activities are permitted only after receiving prior approval for a flight or series of flights.
- **Licence**- The remote pilot certificate will not be required for flying small-to-medium size drones of up to 2 kg for non-commercial purposes.

What are the challenges posed by Nano drones?

- **Security**- Although Nano drones lack artificial intelligence and machine learning

capabilities, they possess lethal intelligence-gathering capabilities.

- **Safety-** Nano drones can be difficult to detect, and their small size makes it difficult to regulate their use.
- Radars are dedicated to detecting aerial tracks, but mini-drones have low radar signatures, making them challenging to identify, especially in urban areas with potential false alerts.
- **Drone Swarms-** When deployed in swarms, they can become highly dangerous without effective countermeasures.
- **Waste disposal-** Nano drones are often made of lightweight materials which can be difficult to recycle or dispose of safely.
- **Complexity-** Protecting against small UAV threats is a complex task that goes beyond simply stopping the drone.

How to detect the Nano drones?

- **Sensors-** To enhance detection capabilities, a combination of sensors is essential.
- **EM sensors-** These defence systems capitalise on the radio signals used for drone communication (uplink and downlink).
- Intercepting these signals through electronic surveillance helps locate the drone and its control station.
- **Infrared sensors-** Thermal cameras can detect drones even in low visibility conditions and at night.
- **Acoustic sensors-** Drones that produce noise during flight can be detectable by acoustic sensors.
- These sensors help classify the drone based on its specific noise characteristics, making them useful in conjunction with radar systems to cover both short and long ranges.

What lies ahead?

- An integrated anti-drone dome with cutting-edge sensors, radars, and AI is crucial for safeguarding critical sites and events.
- By investing in such defences, India can protect citizens and assets from evolving drone threats.

Drone Policy of India

- **[Drones Rules, 2021](#)** - It provides the regulatory framework for commercial use of drones through certification, registration and operation of drones, airspace restrictions, research, development and testing of drones, training and licensing, etc.
- **Drone Airspace Map**- It has opened nearly 90% of Indian airspace as a green zone for drone flying up to 400 feet.
- **Production Linked Incentive (PLI) Scheme**- To promote the growth of drone manufacturing by private companies.
- **UAS Traffic Management (UTM) Policy Framework**- It is an approved public or private entity that would assist various stakeholders to meet the operational requirements for enabling safe and efficient use of airspace,
- **Drone Certification Scheme**- It was notified for making it easier to obtain type certificate by drone manufacturers.
- **Drone Import Policy**- It banned import of foreign drones and freeing up import of drone components.
- **Drone (Amendment) Rules, 2022**- It abolished the requirement of a drone pilot licence for drones of *up to 2 kg* for non-commercial purposes.

References

1. [Business Line- Security challenges of Nano drones](#)
2. [PIB- Drone policy of India](#)

