Perspective: Keeping Drones in Check

For Prelims: Drone technology, Applications of drones, SVAMITVA Scheme, (SOPs) for drone application in Agriculture.

For Mains: Indigenization of Drone Technology, Drone Technology and India, Security Threats posed by Drone Technology, Significance of developing Drone and Counter-Drone Technologies.

Why in News?

- The potential **use of drones** in a **terrorist incident or attack against a critical infrastructure** and soft targets is a growing concern for law enforcement agencies worldwide as the availability of drone technology becomes more widespread globally.
- Days after three people including two Indians were killed in Abu Dhabi in a **drone attack claimed by Yemen's Houthi rebels**, the UAE government has ordered to stop all flying operations of private drones and light sports aircraft in the Gulf country for a month.

Drone Technology and India

What are Drones?

- A drone is a layman terminology for **Unmanned Aircraft (UA)**.
- Originally developed for the military and aerospace industries, drones have found their way into the mainstream because of the enhanced levels of safety and efficiency they bring.
- A drone's autonomy level can range from remotely piloted (a human controls its movements) to advanced autonomy, which means that it relies on a system of sensors and **LiDAR detectors** to calculate its movement.

How Significant is Drone Technology?

At present times, drones are providing much more **economical and commercial viability** to the nations and easy availability of these drones at low cost is making a lot of commercial sense for the industry. The drone technology finds application in the following fields:

- **Defence**: Drone system can be used as a symmetric weapon **against terrorist attacks.** Drones can be integrated into the national airspace system.
- **Healthcare Delivery Purposes:** Recently, the Ministry of Civil Aviation has approved a project with the **Telangana government for using drone technology to deliver vaccines** in remote areas.
- **Agriculture:** In the agriculture sector, **micronutrients and pesticides can be spread with the help of drones.**
    - Recently, the Ministry of Agriculture & Farmers Welfare has released **Standard Operating Procedures** (SOPs) for drone application in Agriculture.
- **Monitoring:** The drone technology in the **SVAMITVA scheme** launched by the Government of

India was used for **real-time surveillance of assets and transmission lines,** theft prevention, visual inspection/maintenance, **construction planning and management, etc.**
- **Mining:** Mining drones are used in difficult conditions of monitoring industrial installations where there may be poisonous gasses, high temperature or high pressure **where it is inconvenient for humans to reach.**

What is Counter Drone Technology?

- Counter drone technology refers to **systems that are used to detect and/or intercept unmanned aircraft systems** while in flight.
    - The technology is rapidly emerging and evolving as the mass adoption of drones takes place.
    - Its growth can be **linked to the increase in concerns about the threat that drones pose** in civilian and military environments.
- Many countries are investing money to develop these technologies such as the **US DOD (United States Department of Defense)** has earmarked about 404 million dollars for R&D and only 83 million dollars for the procurement for ground-based drones and counter drone systems.
    - Also, it is spending about 85 million dollars to develop a counter drone system for the airborne system.
- As far as India is concerned, it has **developed the soft kill counter-drone system** by the industry and **soft and hard kill by the** DRDO.
    - The **soft kill or non-kinetic measures** against drone attacks include using jammers to **disrupt the communication of the drones, disrupting the GPS signals** or spoofing them.
    - The **kinetic or hard-kill measures** include the **use of bullets or guns to disrupt the mechanisms** of drones.

What are the Security Risks Associated with Drone Technology?

- In the past few years there have been several cases of **drones being used by terrorists for planned and attempted attacks** in various parts of the world.
    - India has also witnessed **increased rogue drone activity along its Western border with Pakistan** in recent years with drones dropping weapons, ammunition and drugs as well.
    - In June 2021, drones were **used for the first time to drop explosive devices,** triggering **blasts inside the Air Force Station's technical area in Jammu.**
- **Cheaper cost enables a larger population to procure drones.** Drones are relatively cheaper in comparison to conventional weapons and yet can achieve far more destructive results which is the primary reason for the increased number of drone attacks.
- What makes combat drones most dangerous is the threat of them being used to deliver weapons of mass destruction. **Procurement of combat drones by non-state actors poses serious threats.**

What is the Way Forward?

- **Countering Cross-Border Attacks:** The cross border attacks via drone will remain a bigger focus for India. Countering such drone attacks can only be done with the help of technology.
    - Both drone and anti-drone are evolving technologies with whom India has to keep its pace. This is where the government will need to come in **with a budget to make the stakeholders focus on anti-drone technology.**
    - Also, India's **two close allies US, and Israel** are two leading producers of military drones.
        - The **bilateral relations can be leveraged to gain their assistance** in acquiring and further manufacturing the military drones.
    - The government impetus will facilitate the development of drone technology faster.
- **Immediate Areas of Focus:** Defence against drone attack drones all across India is necessary but currently not possible.
    - It is a newly fed facet which will take time to counter so what can be done immediately by the government is to **identify some areas of core importance and focus all**

synergies in terms of drone defenses as well as creating that awareness within those areas.
    - These areas can be air bases, vip areas in cities etc.
- **Counter-Drone Technology:** It is not the drones that pose the threat but the rogue elements. Undoubtedly drone attacks are a possibility when drones are in use, but quitting their use as a whole is not a solution. The solution to this problem lies in the development of counter drone technology.
    - India needs to **invest in its own Unmanned Aerial Vehicle (UAV) systems and counter-drone technology** to detect and track threats, especially around critical assets.
    - The DRDO has started developing an anti-drone system, one is already in place.

Conclusion

The drone technology is at an evolving stage where a lot of developments are happening and a lot are expected. As far as India is concerned, the focus has to be on staying in tandem with these global developments along with looking at ways and means wherein the mischievous use of drones can be checked in order to tackle the security threat aspect as well.