

Addapedia Editorial Analysis PDF 14 October 2024

X-Band Radar

(The Hindu, 14-10-24)

Context: After devastating floods and landslides killed more than 200 people in Kerala's Wayanad district in July 2024, the Union Ministry of Earth Sciences approved an X-band radar to be installed in the district.

How do radars work?

- Radar is short for 'radio detection and ranging'.
- The device uses radio waves to determine the distance, velocity, and physical characteristics of objects around the device.
- A transmitter emits a signal aimed at an object whose characteristics are to be determined. A part of the emitted signal is echoed by the object back to the device, where a receiver tracks and analyses it.
- Weather radar, also known as a Doppler radar, is a common application of this device.
- The Doppler effect is the change in frequency of sound waves as their source moves towards and away from a listener.
- In meteorology, Doppler radars can reveal how **fast a cloud is moving** and in which direction based on how the cloud's relative motion changes the frequency of the radiation striking it.
- A pulse-Doppler radar can measure the intensity of, say, rainfall by emitting radiation in pulses and tracking how often they're reflected to the receiver.
- This way, modern Doppler radars can monitor weather conditions and anticipate new wind patterns, the formation of storms, etc.

What is an X-band radar?

- Doppler radar relies on **Rayleigh scattering**, when the scatterer is much smaller than the wavelength of the radiation.
- A radar trying to 'see' smaller particles like rain droplets or **fog will need to use radiation of lower wavelengths**, like in the X-band.
- An X-band radar is radar that emits radiation in the X-band of the electromagnetic spectrum: 8-12 GHz, corresponding to wavelengths of around 2-4 cm (this is in the microwave part of the spectrum.)
- The **smaller wavelengths allow the radar to produce images of higher resolution**. However, X-band radars have a relatively shorter range.
- In Wayanad, the new radar is expected to be able to monitor the movements of particles, such as soil, to inform landslide warnings.
- The device will also perform high temporal sampling allowing it to spot particle movements happening in shorter spans of time.

- The initiative to install an X-band radar in Wayanad included installing a C-band radar (4-8 GHz) with an observational range of 250 km in Mangaluru.

How many radars does India have?

- The India Meteorological Department (IMD) started using radar for weather applications in the early 1950s.
- The first indigenously designed and manufactured X-band storm detection radar was installed in 1970 in New Delhi.
- In its X-band radar network, India has both wind-finding and storm-detecting radars, and some with dual capabilities.
- The country also uses **S-band radars (2-4 GHz) for long-range detection**. The first S-band cyclone detection radar was installed in Visakhapatnam in 1970.
- In September 2024, the Ministry of Earth Sciences said India is set to have 56 additional Doppler radars in a few years.
- On September 11, the Union Cabinet cleared the ₹2,000-crore 'Mission Mausam' to upgrade meteorological infrastructure in the country. This includes installing up to **60 meteorological radars until 2026** under the Mission's first phase.

What is NISAR?

- NASA and the Indian Space Research Organisation (ISRO) are currently developing a satellite called NISAR, short for 'NASA-ISRO Synthetic Aperture Radar'.
- It will use radar imaging to produce a **high-resolution map of the earth's landmasses**.
- Its payload consists of an L-band radar (1.25 GHz, 24 cm) built by NASA and an S-band radar (3.2 GHz, 9.3 cm) built by ISRO. Together they will track and record changes in the earth's various natural processes.
- It is currently expected to be launched onboard an ISRO GSLV Mk II rocket in 2025, at a total cost of \$1.5 billion, the bulk of it borne by NASA.

Scuttling people's right to information

(The Hindu - 14-10-24)

Context: Right to Information Act, 2005 has just entered its 20th year

What are the main challenges facing the implementation of the RTI Act?

- Vacant posts in information commissions across states
- Large backlogs of appeals and complaints
- Delays in appointing information commissioners
- Lack of diversity in appointees, with a preference for retired government officials
- Nearly 100 people killed for using the RTI Act. Thousands assaulted, threatened, or faced false cases
- Whistleblowers Protection Act passed in 2014 but not operationalized

How have recent legislative changes affected the RTI Act?

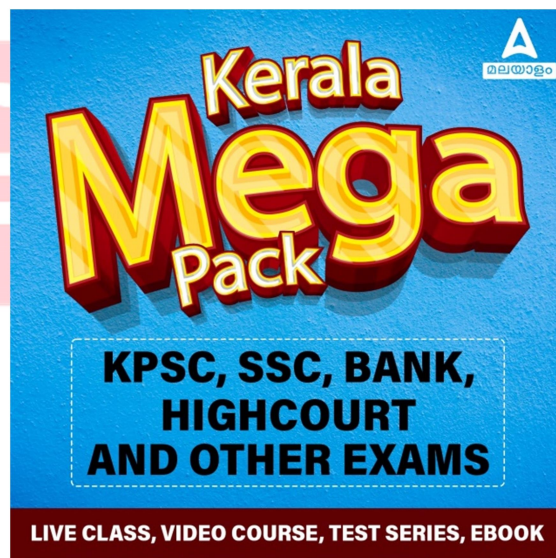
- 2019 amendments reduced the autonomy of information commissions
 - The amendment allowed the central government to determine the tenure, with no guaranteed minimum period. (Earlier 5 year tenure)
 - central government the power to determine salaries, potentially allowing for frequent changes. (Earlier it was fixed equivalent to that of CEC & ECs)
 - It empowered the central government to set these terms, potentially influencing the decisions of commissioners nearing retirement.
 - The changes allowed the central government to make rules for state information commissioners as well, potentially reducing state autonomy in implementing the RTI Act.
- Digital Personal Data Protection Act, 2023, exempted all personal information from disclosure
- Deletion of provision giving citizens information rights at par with MPs and MLAs

What are the consequences of these challenges and changes?

- Mounting backlogs in information commissions
- Long waiting periods for appeals to be heard
- Reduced accountability for violations of the RTI Act
- Potential erosion of citizens' right to information

Can you answer the following question?

Evaluate the effectiveness of the Right to Information Act, 2005, in promoting transparency and accountability in governance. Discuss the challenges facing its implementation and the impact of recent legislative changes on the Act's functioning.





സമഗ്ര PSC
Foundation
Batch