



Why in news?

Department of Telecommunications has decided to allow mobile operators to start 5G trials.

What is 5G?



A **wireless communication technology** using radio waves or radio frequency (RF) energy to transmit and receive data. Beginning in 2019, 5G advances to a full range of services by 2024.

5G



2G and 3G mobile networks relied on microwave wireless network, 4G LTE introduced **IP-based connectivity**, 5G deployment is based on **optical fibre infrastructure**.

Advantages



Faster Data Speed up to 10 Gbps in comparison to the current 4G networks speed of one gigabit per second.



Ultra-low latency i.e. 5G will transfer data in 1 millisecond unlike 50 milliseconds by 4G.



5G is the next generation mobile networks technology that will underwrite USD 12.3 trillion of global economic output by 2035, providing support for 22 million jobs by 2035, increasing GDP and digitizing the economy.



A more connected world with the required capacity and bandwidth for the delivery of services like Internet of Things, Artificial Intelligence, Virtual Reality and Augmented Reality services with unprecedented efficiency.



Challenges



Need **massive investment** approx Rs 5 lakh crore (\$70 billion) to bring in 5G.



India has **expensive spectrum**, the highest in the world and the allocated quantity is well below global best practices, while 40% of the spectrum is lying unsold.



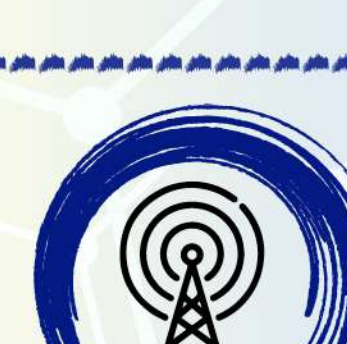
Lack of uniform policy framework causing delays in rolling-out Optical Fibre Cables (OFC) and telecom towers.



Local Regulatory Issues prohibiting the cost effective roll-out of small cells in city centres where 5G is initially expected to be most in demand.



Low optical fibre penetration as below 20% sites are connected through fibre rest 80% of cell sites are connected through microwave backhaul.



High Import of Equipment (approx 90 % of India's telecom equipment market) due to lack of local manufacturing and R&D.



Chances of **increased digital divide** leaving rural areas behind due to commercial viability.



Human exposure to radio frequency electromagnetic fields impacting health.



Steps taken & Way forward



“Bharat Net Programme” to link 2.5 lakh gram panchayats through optical fibre network.



“National Digital Communications Policy 2018” envisaging a digitally empowered economy to meet needs of the citizens and enterprises with a resilient and affordable digital communications infrastructure and services.



“Building an End to End 5G Test Bed Program” envisaging close collaboration between the universities and small technology companies to build broadly compliant with the 3GPP standards.

5G

The report of the **Steering Committee of the High Level Forum** laid out three priority areas in 5G:



Deployment - An early roll out of 5G services to maximise the value proposition of 5G as a technology.



Technology - To build indigenous industrial and R&D capacity, especially for the design and Intellectual Property.



Manufacturing - To expand the manufacturing base for 5G technologies, which includes both semiconductor fabrication and equipment assembly and testing.

Need for

Improved Spectrum Policy, a clear roadmap of spectrum availability and earmark frequency bands aligned with the global standards;



Simplified security audits;



A balanced spectrum ecosystem to encourage investment;



Favorable Taxation Policy to contribute to further evolution of the tax framework.

