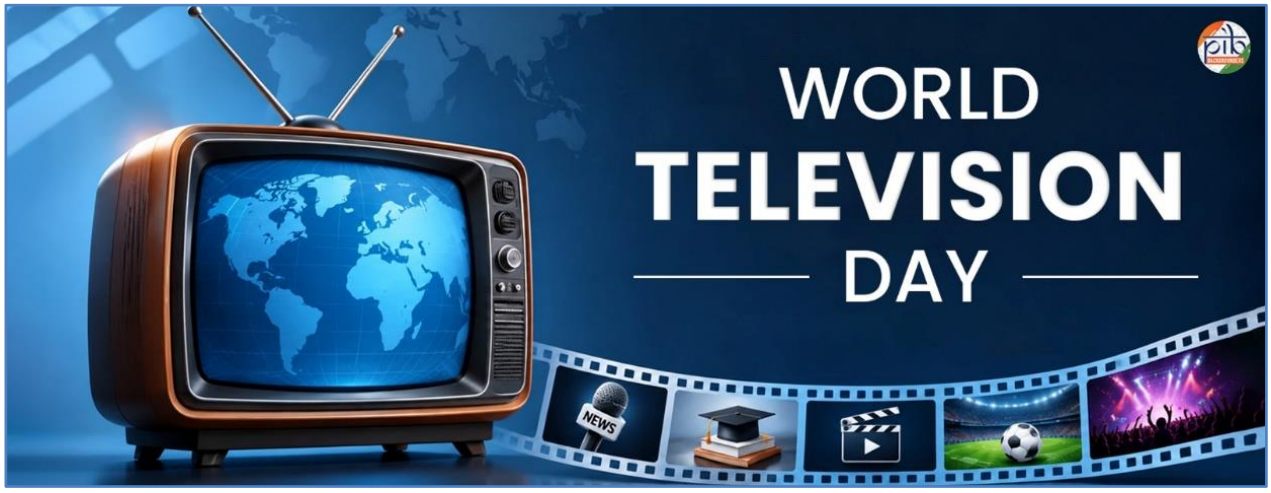
BACKGROUNDERS
Press Information Bureau
Government of India

India's Television Broadcasting Shift

Tracing the transition from Analogue to Digital TV Broadcasting

November 20, 2026

Setting the Context: World Television Day



Broadcasting is the systematic transmission of audio and video content to a large audience through electronic communication networks. **Television broadcasting** combines sound and moving images to deliver news, information, education and entertainment. Over the decades, technological advancements have expanded its reach through terrestrial, satellite, cable and internet-based platforms. This has made television an important medium of mass communication.

In India, television broadcasting has transformed communication by connecting diverse communities across geographical and linguistic boundaries. It has supported **socio-economic development** through educational programmes, agricultural information, health awareness and public service campaigns. It has also emerged as a major **source of entertainment,** bringing films, television serials, and sports etc. into millions of households, while also promoting India's cultural and linguistic diversity**.** It has further strengthened **public administration** by enabling the dissemination of government policies, welfare schemes, development initiatives and emergency information, thereby improving public awareness and access to essential information.

Recognising television's growing influence on public opinion, global communication and cultural exchange, the **United Nations General Assembly proclaimed 21 November as World Television Day in 1996.** The observance recognises television's role in informing, educating and connecting societies. It also highlights the importance of responsible broadcasting in addressing contemporary challenges and supporting informed public discourse.

A television screen can bring distant events, new ideas and different perspectives into people's homes. It

connects audiences with developments beyond their immediate surroundings. Over the decades, television has become an important medium for entertainment, information, education and public communication in India.

The Changing Technologies of Television

Television broadcasting in India has evolved alongside advances in **communication and transmission technologies**. Each technological advancement transformed the transmission and distribution of television programmes, expanding their reach and accessibility.



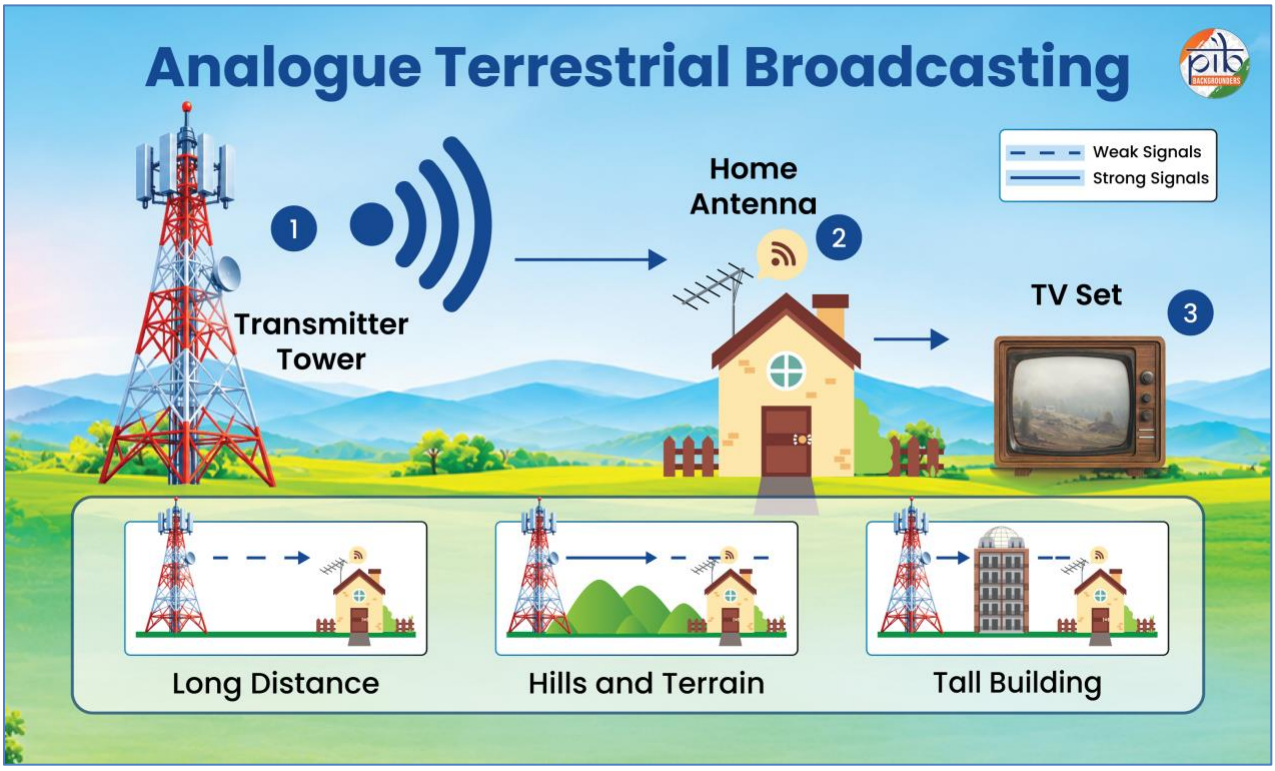
The Early Broadcast Era: Terrestrial Television (1959–1975)

India's television journey began with an experimental **broadcast in Delhi on 15 September 1959**. The initiative was launched by **All India Radio (AIR) under the Ministry of Information and Broadcasting**. A makeshift studio transmitted programmes through a small transmitter. Initially, broadcasts reached a limited area around Delhi. The experiment evolved into a **regular television service in 1965**. Doordarshan began daily transmissions of daily Hindi News Bulletin on **15 August 1965**. By 1972, services were extended to Mumbai and Amritsar and then on to seven other cities by 1975. All this time, it was part of the national broadcaster, All India Radio. On April 1, 1976, it transited to become a separate Department in the Ministry of Information and Broadcasting. ***Click to Read More: Doordarshan's Legacy***

Television broadcasting during this period relied primarily on **analogue terrestrial transmission**. This system used ground-based transmitters to send television signals through radio waves. Transmitters broadcast signals from antennas installed on elevated towers. Household television sets received these signals through indoor or outdoor antennas.

However, terrestrial broadcasting had **geographical and technical limitations.** Signal reception depended on the distance between households and transmitters. Hills, buildings and other physical obstructions could

weaken or block signals. Consequently, reception quality varied across locations.



Analogue transmission also had **limited channel capacity**. Each assigned television frequency channel generally carried one programme. Expanding services therefore required additional frequencies, transmitters and supporting infrastructure. These constraints contributed to the gradual expansion of television services across the country.

Extending television beyond the reach of terrestrial transmitters required a different technological approach. **Satellite communication offered the possibility of transmitting television signals across much larger geographical areas**. This paved the way for satellite-based broadcasting and a wider national television network.

Satellite and Colour Broadcasting: Expanding Television's Reach (1975–1988)

The mid-1970s marked a turning point in India's television history. By 1976, India's terrestrial network had eight stations covering **45 million people across 75,000 square kilometres**. Satellite technology and colour broadcasting transformed television's reach and viewing experience. Two major developments accelerated this expansion, taking television beyond urban centres.

The first major breakthrough was the **Satellite Instructional Television Experiment (SITE),** conducted between August 1975 and July 1976. It used **satellite technology to broadcast educational programmes** directly to villages across six States. The experiment aimed to use television for education and socio-economic development. SITE demonstrated how satellite technology could overcome geographical barriers. It established television's potential as an instrument of education and public communication.

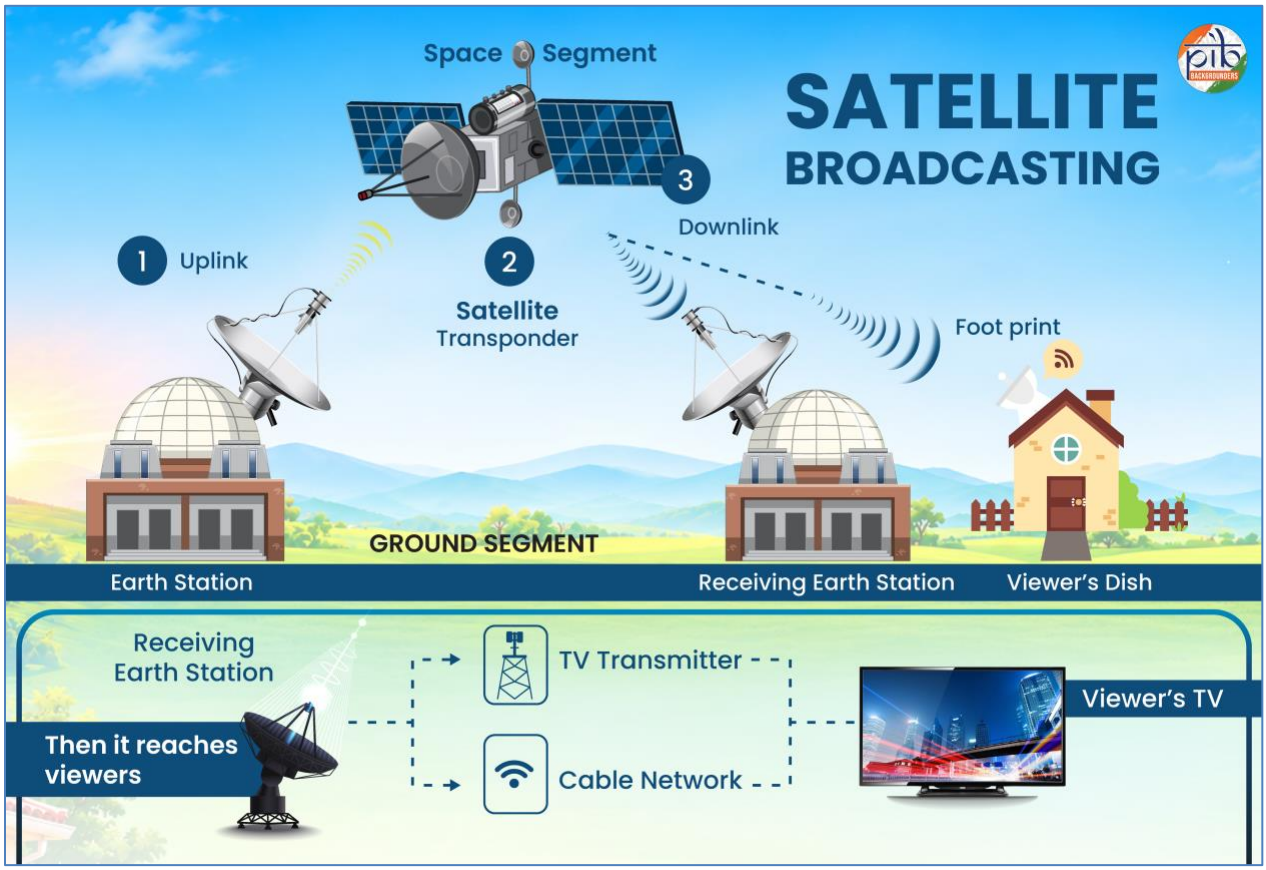
The next major development came with the introduction of the **Indian National Satellite (INSAT) system**. **INSAT-1A, launched on April 1982**, was India's **first-generation operational domestic communications satellite**. This enabled a common programme feed from Delhi to regional stations across the country. However, INSAT-1A was abandoned in 1983.

INSAT-1B, launched in August 1983, strengthened this emerging national broadcasting network. It achieved full operational capability in October 1983. The satellite supported television broadcasting and other communication services. It helped consolidate satellite-based connectivity across Doordarshan's regional stations.

Did You Know?

Alongside satellite expansion, colour broadcasting transformed the television viewing experience. Doordarshan's first colour telecast took place on 15 August 1982, coinciding with the launch of its National Programme. Later that year, colour television gained wider public visibility through the live coverage of the Asian Games in New Delhi in November 1982. This milestone marked a shift from black-and-white transmissions to colour broadcasting.

Unlike terrestrial broadcasting, which relies on ground-based transmitters with geographically limited coverage, satellite communication enables television signals to reach much wider areas. A single satellite can serve multiple regions through its communication footprint. This capability helped extend television services to remote and previously underserved areas.



A satellite communication system has two main components: the **ground segment** and the **space segment**. The ground segment comprises Earth stations and associated transmission and reception equipment. The space segment consists of the satellite and its onboard transponders, which receive and retransmit communication signals.

The broadcasting process involves three stages. First, **the uplink transmits the television signal from an Earth station to the satellite.** The Earth station sends the signal towards the satellite using an uplink

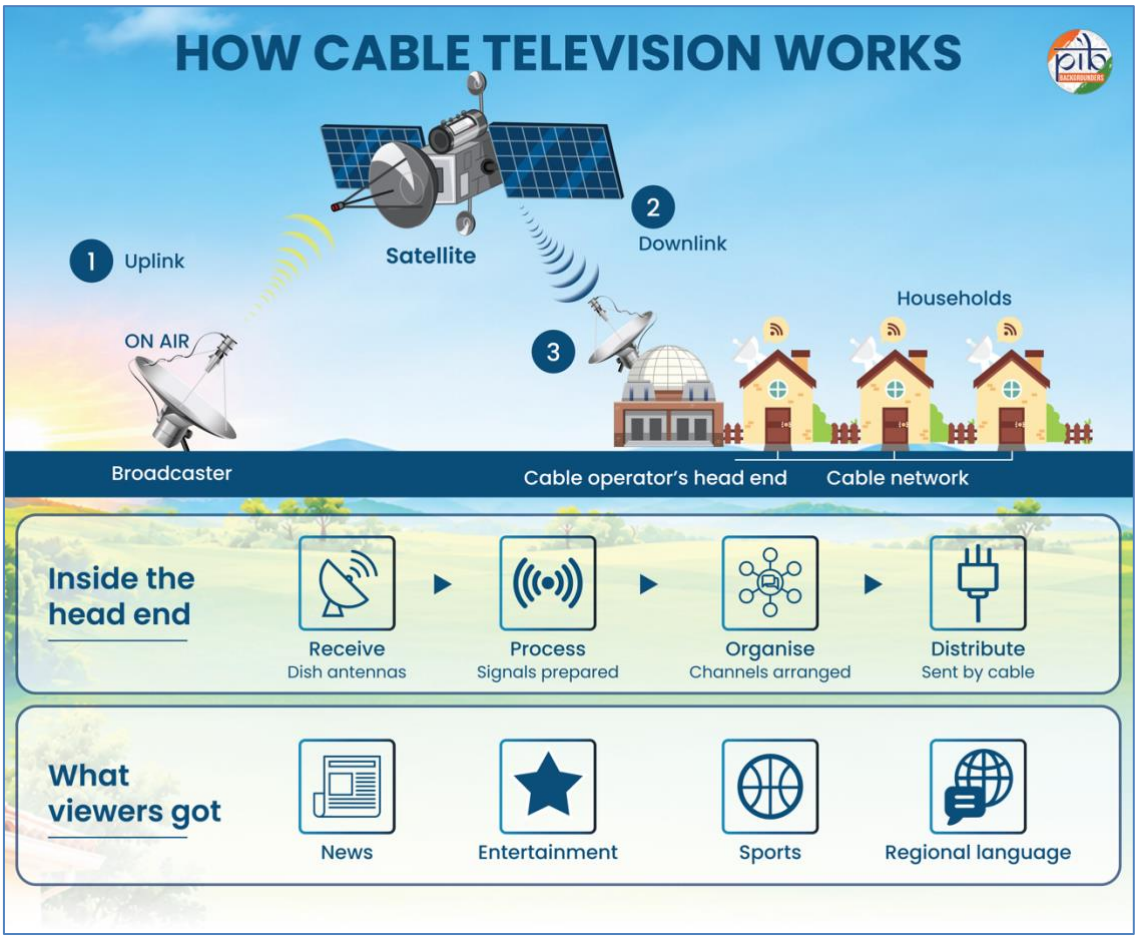
frequency. **The satellite's transponder receives the signal**, amplifies it and converts it to a different frequency. It then retransmits the signal towards Earth through the **downlink.**

Next, receiving Earth stations capture the downlinked signal. The signal is then distributed to television transmitters or cable distribution networks for delivery to viewers. A dish antenna at the subscriber's premises receives the satellite signal directly. Thus, satellite communication provides the long-distance link, while terrestrial transmitters and cable networks can support its final distribution.

This combination of satellite connectivity and colour broadcasting transformed India's television landscape. It expanded television's geographical reach and enhanced the viewing experience. The next phase brought private satellite television channels in the early 1990s. From the mid-1990s, cable television networks further expanded viewing choices in Indian households.

Did You Know? A satellite's **footprint** is the area on Earth where its signal can be received. A dish placed anywhere inside that area can pick up the satellite's broadcast. A dish outside it gets a weak signal or none.

The Multi-Channel Era: Cable and Satellite Television (1990–2005)



This period witnessed a major transformation in India's television landscape. International satellite channels began reaching Indian audiences, starting with CNN. The launch of Star TV and Zee TV further accelerated the growth of satellite television. Domestic broadcasters, including Sun TV, also entered the emerging multi-channel market.

The arrival of satellite channels gave cable television a major boost. Broadcasters transmitted programme signals to satellites through uplinks. Satellites retransmitted these signals towards Earth, where local cable

operators received them using dish antennas at their head ends. Operators then processed and organised the channels before distributing them to households through cable networks. Satellite technology enabled long-distance transmission, while cable networks facilitated local distribution. This combination brought a wider range of news, entertainment, sports and regional-language programming into Indian homes, beyond the reach of Doordarshan's terrestrial services.

However, cable television depended on physical infrastructure to connect operators with households. Extending these networks to remote and geographically challenging areas could be difficult. Direct-to-Home (DTH) broadcasting emerged as an alternative distribution platform. Unlike cable television, DTH delivers satellite signals directly to a dish antenna installed at the subscriber's premises.

Direct-to-Home and Digital Broadcasting (2003–2017)

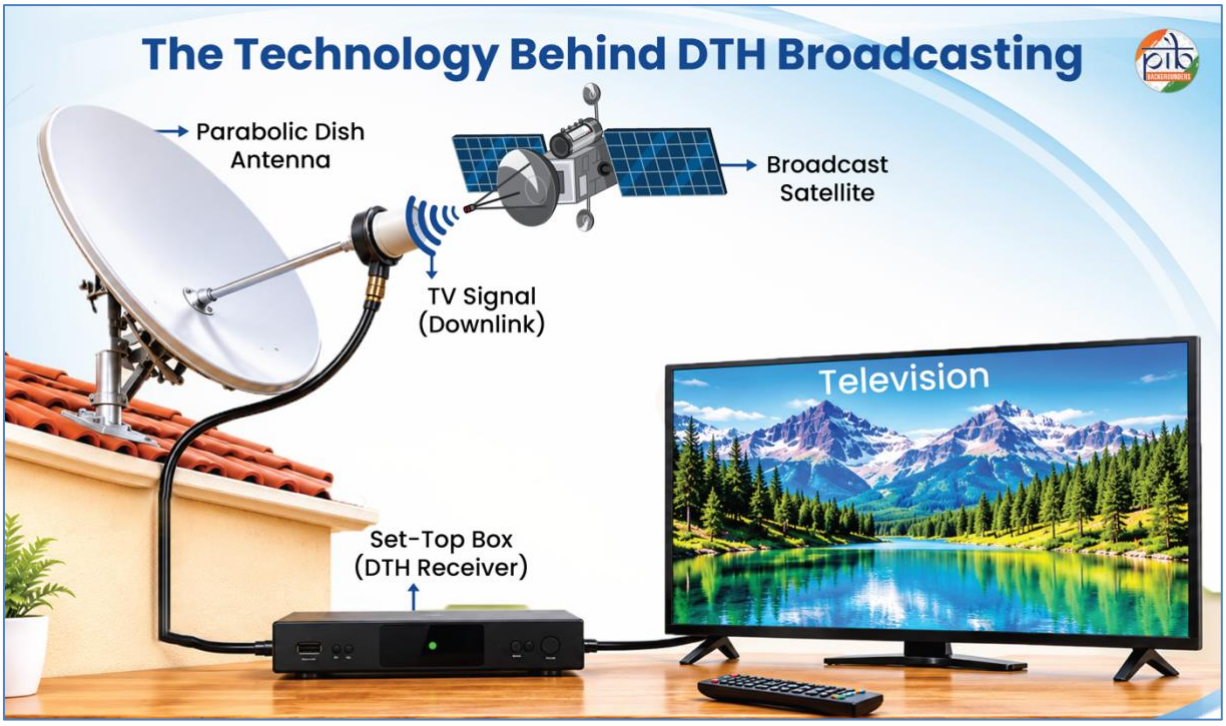
The next phase of India's television evolution was marked by the expansion of DTH services and the transition from analogue to digital broadcasting. Dish TV launched India's first commercial DTH service in October 2003. In December 2004, Prasar Bharati launched Doordarshan's DD Direct Plus, now known as DD Free Dish. It introduced a free-to-air DTH platform that did not require a monthly subscription. These developments expanded access to satellite television, including in areas with limited cable connectivity.

DTH broadcasting delivers television signals directly from satellites to individual households, without requiring a local cable network. Broadcasters first convert television content into digital signals and compress them for efficient transmission. **These signals are transmitted to satellites using designated radio frequencies, generally in the Ku-band.** Satellites receive and retransmit these signals towards Earth over designated coverage areas.

Small dish antennas installed at subscribers' premises receives these signals. A **digital set-top box processes the received signals**, decodes the selected content and makes television channels available for viewing. Subscription-based services use encryption and authorised access systems to restrict viewing to subscribed channels. In contrast, **free-to-air services, such as DD Free Dish, do not require a monthly subscription**.

What is Ku-band?

Satellite-based television services use specific portions of the radio frequency spectrum to transmit signals between satellites and Earth. The **Ku-band** is one such frequency band, commonly used for Direct-to-Home (DTH) broadcasting. It generally operates in the frequency range of 12–18 GHz. DTH services commonly use frequencies around 10.7–12.75 GHz for downlink transmission, depending on the system and regional allocation. Its relatively high frequencies allow the use of smaller dish antennas at subscriber premises. However, Ku-band signals can be affected by heavy rainfall, which may temporarily interrupt reception.



Modern Broadcasting: Emerging Technologies and New Frontiers (2018–Present)

Since 2018, India's broadcasting landscape has transformed with expanding internet connectivity, digital platforms and connected devices. Television viewing is no longer limited to conventional television sets or scheduled programmes. Viewers can access content through **smartphones, computers and Smart TVs. Over-the-top (OTT)** platforms have enabled on-demand viewing across devices and locations. In November 2024, **Prasar Bharati** launched **WAVES**, its OTT digital streaming platform, bringing public service broadcasting content to digital audiences. By November 2026, WAVES had recorded about 1.6 crore registered users. ***Click to Read More About: WAVES OTT***

Unlike conventional terrestrial broadcasting, which transmits television signals from ground-based towers to receiving antennas, and satellite broadcasting, which relays signals through communication satellites to receiving dishes, **OTT platforms deliver audio and video content through the internet.** Content is hosted on servers in data centres and accessed through broadband connectivity. Content Delivery Networks use geographically distributed servers to cache content closer to users. This helps reduce latency and improves content delivery. **Click to Read More:** ***Data Centres in India***; ***Cloud Ecosystem in India***

Another emerging technology is **Direct-to-Mobile (D2M) broadcasting**. It uses terrestrial infrastructure to transmit video, audio and data directly to compatible mobile devices. Reception does not require a SIM card or mobile data connection. Unlike OTT streaming, D2M uses broadcast transmission to reach multiple devices

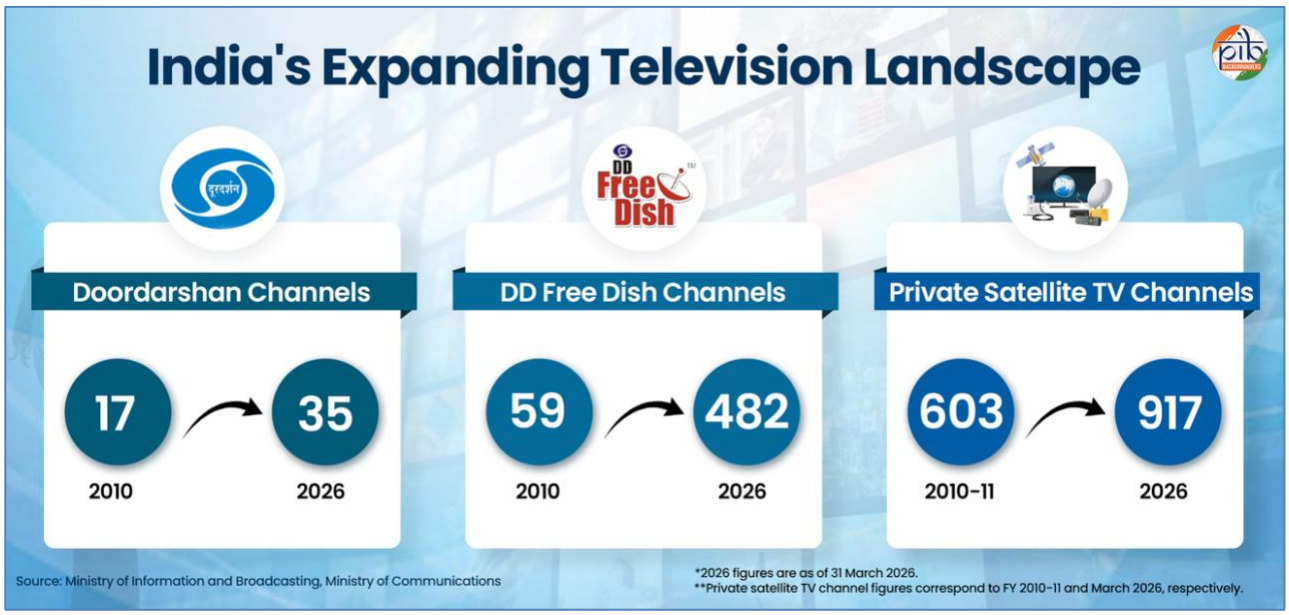
simultaneously.

Did You Know?

Prasar Bharati signed an MoU with IIT Kanpur to develop a next-generation broadcasting roadmap. A proof of concept for D2M broadcasting was subsequently completed by IIT Kanpur. Trials also examined hybrid transmission using High Power High Tower (HPHT) and Low Power Low Tower (LPLT) transmitters. In November 2025, Prasar Bharati published test results covering telecom interference and the thermal impact of D2M reception on mobile devices. The tests included an ATSC 3.0-based broadcast system.

Shaping the future of Broadcasting

India's television ecosystem has grown from a single experimental service into a diverse, multi-platform network. **Doordarshan now runs 35 channels, up from 17 in 2010**.[1] DD Free Dish carries 482 channels, including educational ones, up from 59[2]. Private satellite television has expanded from 603 channels in 2010–11 to 917 permitted channels as of March 2026. Of these, 908 channels were available for downlinking in India, comprising 342 pay channels and 566 free-to-air (FTA) channels. Of the pay channels, 238 were standard-definition (SD) and 104 were high-definition (HD) channels[3]. Private pay DTH serves 49.05 million active subscribers as on 31st March 2026. Doordarshan's DTH service provides 100% geographical and population coverage across the country[4].



Collectively, terrestrial, satellite, cable, DTH and digital platforms bring television to urban, rural and remote homes. **The future of broadcasting will increasingly be shaped by technological convergence and expanding digital access.** High-definition transmission, digital delivery and internet-based platforms are transforming how audiences' access and experience content. Broadcasting is also moving beyond conventional television networks towards more flexible and connected delivery systems. Public and private broadcasters will continue to play an important role in this transition. With expanding infrastructure, technological innovation and wider platform integration, India's broadcasting ecosystem is evolving to serve diverse

[1] https://mib.gov.in/en/node/3887
[2] https://mib.gov.in/en/node/3888
[3] https://www.trai.gov.in/sites/default/files/2026-10/PR_No135of2026.pdf
[4] https://mib.gov.in/en/node/3882

audiences and changing viewing preferences. These developments are shaping a more accessible, connected and future-ready broadcasting landscape.

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