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01

Communicating Swachhata, Changing Behaviour

The Social and Behaviour Change Communication Journey of the Swachh Bharat Mission

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Swachh Bharat Mission (SBM) placed behaviour change at the centre of sanitation, moving beyond infrastructure towards sustained practices and social norms. **Social and Behaviour Change Communication (SBCC)** transformed communication from information dissemination into dialogue, participation, and collective action. **Mahatma Gandhi** and his ideals of cleanliness and **self-service** became the guiding principles of SBM. Community institutions and grassroots actors, like **Swachhagrahis,** helped turn individual sanitation practices into shared community norms. **Multiple communication channels** reinforced Swachhata messages across households, communities, public spaces and digital platforms. Women and children became both beneficiaries and **active agents** in spreading and sustaining sanitation behaviours. Reinforcement, recognition, incentives and participatory monitoring helped move Swachhata from a campaign activity to sustained community behaviour.

The Behavioural Foundations of Swachh Bharat

The **Swachh Bharat Mission (SBM)** has treated sanitation as a matter of **behaviour, participation and collective responsibility.** The Mission recognised that infrastructure alone could not create sustained sanitation outcomes. SBM therefore placed **behaviour change communication** at the centre of its implementation approach. Under SBM-G, the focus is not limited to toilet construction. It encourages communities to adopt safe and sustainable sanitation practices. Similarly, under SBM-U, the focus is not only on waste processing. It focusses on making waste segregation at source a public habit and achieving total urban sanitation and public cleanliness. **Information, Education, Communication (IEC) strategies, behaviour reinforcement,** and **monitoring** are therefore integral to the SBM implementation strategy. SBM has evolved from building sanitation assets towards sustaining sanitation behaviour. This evolution places **Social and Behaviour Change Communication (SBCC)** at the centre.



Swachh Bharat Mission (SBM)

Launched on 2 October 2014, SBM became one of **India's largest government-led sanitation movements.** The Mission operates through two components: **SBM-Grameen** and **SBM-Urban.** SBM-G focuses on rural sanitation, toilet access, usage, and waste management. SBM-U focuses on urban sanitation, waste management, and clean public spaces. For details on achievements of SBM, please also read here.

From Information to Behaviour Change

Social and Behaviour Change Communication (SBCC) uses communication to support positive social change. It combines several approaches to influence knowledge, attitudes, norms and practices. These include **interpersonal communication, community mobilisation and mass media.** It also includes **social media, entertainment, advocacy and strategic partnerships.**

SBCC under SBM goes beyond simply disseminating information. It seeks to influence attitudes, social norms and everyday practices. This approach under SBM combines **interpersonal communication, community mobilisation, awareness generation and collective action.** Its long-term objective is to change social norms around open defecation and waste management. It recognises that people's behaviour is influenced by their social environment. Families, neighbours, community groups, local institutions and trusted leaders can reinforce or discourage particular practices. **Communication, therefore, works through relationships and collective participation.**

Mahatma Gandhi: A Moral Anchor for SBCC under SBM

Mahatma Gandhi's emphasis on cleanliness and sanitation provided a powerful foundation for the SBM's communication strategy. The Mission was launched on 2 October 2014 to achieve a Swachh Bharat by **Gandhi's 150th birth anniversary in 2019.** The **logo** of SBM represents the spectacles of

The logo of SBM

Mahatma Gandhi. It has helped in creating the **brand value** and representing the emotion for cleanliness worldwide. It has also helped the masses associate themselves easily and quickly with the mission. **Consequently, rural India was declared ODF on 2 October 2019.**

Mahatma Gandhi had started his campaign for cleanliness from Champaran during the Satyagraha movement. His vision of an ideal village was one with perfect sanitation, village lanes and streets free of all avoidable dust. In his book ***"Ashram Observances in Action"***, Gandhi writes that **sanitary service is an essential and sacred service.** His **Sevagram Ashram** laid emphasis on engaging no outside labour for this work. The members themselves attended in turns to clean the premises. The Ashram rules also laid down that it was necessary that inmates wash their hands and wipe them with a clean napkin. **SBM's messaging drew on this legacy** to build public ownership and encourage participation in behaviour change.

This connection also shaped the language and symbolism of the behaviour change movement. The term **'Swachhagrahi'** consciously drew from Gandhi's tradition of **Satyagraha,** recasting citizens and sanitation volunteers as participants in a collective **Swachhagraha.** SBM, therefore, revered Mahatma Gandhi not merely as a commemorative figure, but as a **communication anchor** for linking cleanliness with collective action, citizenship and sustained behavioural change.

Taking Behaviour Change to the Doorsteps: Changing Individual Habits

SBM translated SBCC principles into direct, community-level engagement. **Interpersonal Communication (IPC)** became an important pathway for influencing sanitation practices. Unlike one-way messaging, IPC enables **dialogue between communicators and community members.** It allows concerns, perceptions, and practical barriers to be discussed within **local contexts.** The government relied on frontline workers, Swachhagrahis, community leaders, self-help groups (SHGs), and existing social networks for **facilitating IPC.** The **methods** included home visits, face-to-face counselling, small-group sessions, peer communication and discussions at homes, health centres, community settings and religious gatherings.



A meeting of Swachhagrahis and SHG didis in Bihar

Swachhagrahis became grassroots foot soldiers and motivators under **SBM-G.** Their role extended beyond promoting toilet construction. They helped families adopt and sustain safe sanitation behaviours. Swachhagrahis facilitated **community nudging** and **triggering,** household visits, and sanitation discussions. They also supported community mobilisation and strengthened **Nigrani Samitis.** Their engagement continued even after ODF declaration to further reinforce sanitation practices among individuals and families.

Interpersonal communication also extended into **community-led vigilance** through **Nigrani Samitis.** These committees were strengthened to support ODF achievement and sustainability. Their activities included **regular morning and evening monitoring** within villages. Nigrani activities focused particularly on **common open defecation spots.** They



Nigrani Samiti using interpersonal communication to spread the message of swachhata

reinforced sanitation messages through continued community presence and follow-up. Regular Nigrani drives, village meetings, and **Ratri Chaupals** helped sustain ODF behaviour. Swachhagrahis were provided with a **toolkit** that included a **torch and whistle** to support their field-level vigilance during community monitoring.

The approach therefore moved sanitation from an individual practice towards a shared community norm. **The community itself became an active participant in reinforcing and sustaining behaviour change.**

From Individual Conversations to Collective Action

Interpersonal communication created opportunities for dialogue at the household and community level. Community mobilisation took this process

further by bringing people together to discuss shared sanitation concerns and identify collective solutions. Under SBM, it provided platforms for communities to participate in decisions affecting their everyday sanitation practices. **Gram Sabhas, chaupals, community meetings** and other local forums enabled dialogue on sanitation issues and helped communities build consensus around common priorities.

Community mobilisation also brought different groups into the sanitation conversation. **Community leaders, Panchayati Raj Institutions, volunteers, religious leaders and women's groups** could facilitate local discussions and events. This approach connected individual behaviour with collective responsibility. A household adopting safe sanitation practices became part of a wider community effort. **Community discussions** created opportunities to identify local concerns, exchange experiences, and build agreement around desired practices. This approach was also reflected through campaigns such as **Chalo Champaran, Swachh Shakti, Swachh Sundar Sauchalaya, Swachhata Hi Seva, Swachh Sundar Samudayik Sauchalaya, Swachh Bharat Diwas, Swachhata Mahotsav and Swachhata Pakhwada.** These campaigns provided platforms for collective participation around sanitation and cleanliness.

Community mobilisation was further reinforced through **mid-media and outdoor communication.** These channels carried sanitation messages beyond individual conversations and into spaces where communities routinely gathered. **Puppet shows, magic shows, drama and street theatre (nukkad natak)** are some of the examples of local and traditional mid-media formats. Outdoor media uses public spaces such as **billboards and wall paintings on authorised public walls** to communicate sanitation messages. Wall paintings and **graffiti art** have been used especially to communicate Swachhata messages while reflecting local identity and supporting city beautification. The importance of such formats lies not only in message visibility, but also in how they place Swachhata within the everyday social environment. A sanitation message encountered during a community event, street performance, or public gathering can reinforce conversations taking place within households and local groups.



A wall painting in Assam spreading swachhata messages in local language

A major area of focus under SBM-U has been the **leveraging of digital tools** for maximizing citizen outreach. For example, **Google Maps** was used to upload of more than **67,000 public toilet blocks** across more than **3,300 cities.** This has made sanitation facilities more easily accessible to all categories of citizens. The **Swachhata App** has provided a one-stop digital platform for grievance redressal for citizens to register their complaints about any aspect of cleanliness.

Swachhata App available for both Android and iOS users

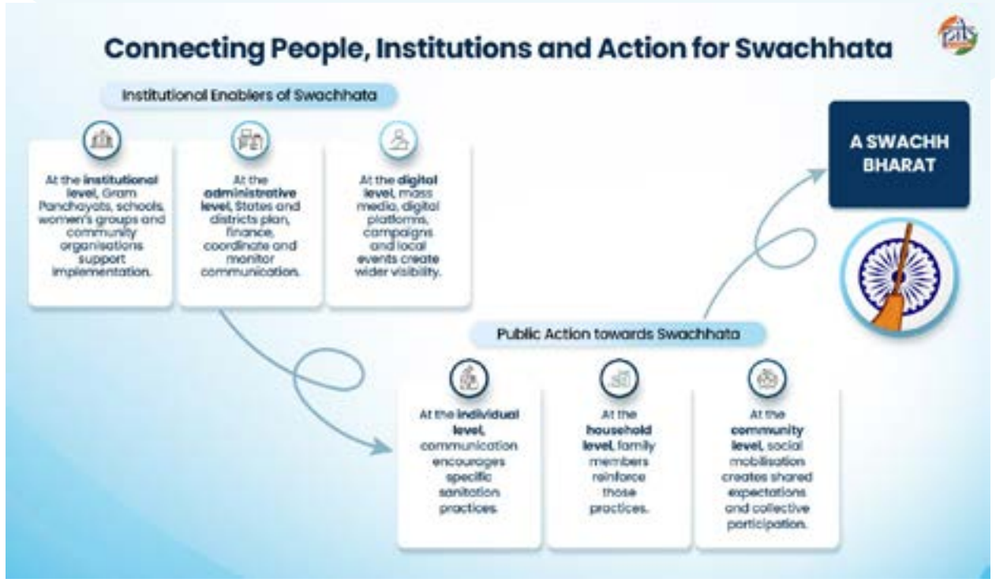
Mass media provided another layer of reinforcement. These included **television, radio, print,** and **online media** channels. Community radio carried discussions, testimonials, stories, and public service announcements related to swachhata. **Social media platforms** such as Twitter, Facebook, YouTube, and Instagram proved instrumental in disseminating key messages and building virtual networks and communities. **Mobile telephone services** supported awareness through bulk SMS, WhatsApp, and podcasts.



A social media post regarding SHS 2026 campaign

Swachh Talks provides an example of digital engagement within SBM-U. It is a **peer-learning webinar series** for sharing field experiences and best practices related to Swachhata. Such platforms extend the conversation beyond conventional sanitation to issues like plastic waste management and promotion of the circular economy.

The movement from IPC to community mobilisation represents a shift in the **unit of behaviour change.** This progression is important to the SBCC approach under SBM. Communication does not end when a message reaches an individual. It gains greater significance when people discuss it, adapt it to their local context, and participate in collective action. In this process, **participation itself becomes a form of communication.**



Celebrity Endorsements and Popular Culture as Vehicles for SBCC

Swachh Bharat also used the reach of celebrities to strengthen its SBCC efforts. In 2016, **Amitabh Bachchan** and **Sachin Tendulkar** featured in national audio-visual campaigns for SBM-G. These campaigns were designed to make communication more people-centric and support behaviour change and citizen engagement. Both of them also **participated in Swachh Bharat events** to encourage grassroots workers and sanitation champions. **Amitabh Bachchan** subsequently led the **'Darwaza Band' campaign** in 2017. The campaign **promoted toilet use** among people who had toilets but continued to practise open defecation. It also featured **Anushka Sharma,** who **encouraged women to take leadership** in addressing sanitation within their villages. The campaign used mass media to complement grassroots IEC and interpersonal communication by Swachhagrahis.



Celebrity Endorsements to promote toilet usage

Cinema also became a vehicle for addressing sanitation-related social norms. **'Toilet – Ek Prem Katha',** featuring **Akshay Kumar** and **Bhumi Pednekar,** brought sanitation and toilet use into mainstream popular culture. In 2018, **Akshay Kumar** and **Bhumi Pednekar** featured in an SBM-G campaign promoting **twin-pit toilet technology.** The film was also made available for **non-commercial screenings in villages** by state and district SBM-G teams. The campaign further used celebrity influence to address the stigma around emptying toilet pits and encourage sustained toilet use. **Vidya Balan** featured in a video propagating the slogan "jaha soch, vaha shauchalaya". It stressed upon the health benefits of using toilets. It also encouraged women-led toilet-building initiatives in rural households. Thus, popular media served as an additional layer of SBCC, taking sanitation messages from government campaigns into television, cinema and public discourse.

Women and Children: Shaping and Experiencing Swachhata

Sanitation can transform everyday experiences while creating new spaces for participation. For women, ***Suraksha, Suvidha and Swabhimaan*** capture three important dimensions of this change. Safety, convenience, and self-respect connect sanitation with women's everyday lives. The impact is reflected in women's reported experiences. A study conducted in collaboration with the Ministry of Jal Shakti found that **93 percent of women no longer feared being hurt by someone or harmed by animals while defecating.** 91 percent reported **saving up to an hour** and avoiding travel of up to a kilometre. 93 percent also reported **no longer restricting food or water intake** to manage sanitation needs.

Interestingly, in **Bihar**, people have started calling toilets **'Izzatghars'**, signifying their connection with the dignity of women. Construction of toilets has, thus, helped address a significant social imbalance. It is becoming a reason for economic and social empowerment. Women have contributed to sanitation as **community actors.** Women's groups and SHGs form part of the community networks through which sanitation communication can take place. This **connects sanitation communication with existing community institutions** and networks.



Schools educating children about Swachhata

Children provide another important link between sanitation communication

and everyday behaviour. Schools can become spaces where sanitation practices are discussed, demonstrated and reinforced. The SBM identifies students as participants and **agents of change.** SBM has focused on **school-based approaches** including curriculum integration, awareness campaigns, Shramdaan, mobile-van education and visits to waste-management facilities. Communication has also reached children through formats that combine learning with participation and entertainment. These include **educational videos, flipcharts** and other materials for small-group engagement. It also recognises local and traditional formats such as puppet shows, magic shows, drama and street theatre for communicating sanitation messages.



Together, women and children illustrate the two-way nature of sanitation behaviour change. **They experience the benefits of improved Swachhata while also contributing to its spread through families, schools and communities.** Women's groups may strengthen community networks, while children may carry sanitation messages into households and everyday interactions. Swachhata therefore becomes not only a matter of infrastructure or individual practice, but a shared community behaviour sustained across generations.

Reinforcing Desired Swachhata Behaviour through Awards & Recognitions

Sustaining Swachhata requires reinforcement beyond initial awareness and mobilisation. The SBM approach combines certification, recognition, nudges, and community incentives. These mechanisms help sustain participation and encourage continued adoption of desired sanitation practices.

Certification protocols awarded to cities and villages provide measurable standards for sanitation and cleanliness outcomes. Under SBM, **ODF, ODF+, ODF++, Water+, and Star Rating protocols** helped standardise these outcomes with citizen participation. The **ODF protocol** focuses on ensuring access to toilets for all citizens. **ODF+** extends this focus to functional and usable Community and Public Toilets. Their proper operation and maintenance support continued toilet use and help prevent slippage to open defecation. **ODF++** addresses the safe containment, evacuation, transportation, and processing of faecal sludge. It seeks to prevent untreated sludge from entering open drains, water bodies or fields. **Water+** extends the focus to untreated black and grey water. It also promotes reuse of a portion of treated wastewater. For solid waste management, the **Star Rating Protocol for Garbage Free Cities** provides a single metric for assessing a city's waste management status. Its parameters include door-to-door collection and source segregation. They also cover scientific processing of waste and remediation of legacy dumpsites. Together, these protocols create benchmarks against which Swachhata outcomes can be assessed.



Recognition can reinforce participation by making positive behaviour visible within the community. SBM rewards and felicitates **best-performing workers, peer leaders and local champions** through **peer recognition** and **appreciation letters** from the government. Recognition can also create aspirational examples for others to emulate. The approach therefore connects individual contribution with collective identity and community participation.

Incentives can also be designed around specific local sanitation and waste management challenges. The **Swachhata Chronicles** documents an example from Panchayat Halqa Hiller in Jammu and Kashmir. The initiative

introduced **"Give Polythene Get Gold"** to encourage communities to collect plastic waste. Youth and women supported the campaign, which aimed to make local areas free from polythene waste. Two gold coins were offered against specified quantities of collected plastic waste. The initiative combined awareness, community participation, and an incentive to encourage action. The campaign also included cloth bags for households and community shramdaan drives.



A winner of "Give Polythene Get Gold" campaign

Thus, reinforcement under Swachhata operates at multiple levels. Protocols establish standards, nudges encourage desired actions, recognition celebrates sustained participation, and community incentives can stimulate local ownership. These mechanisms help shift Swachhata from a campaign-driven activity towards a sustained behavioural practice.

Behaviour Monitoring for Maintaining Swachhata

Sustaining Swachhata requires mechanisms that can assess progress and identify areas needing further action. Monitoring, therefore, extends beyond measuring infrastructure. It also creates opportunities for citizen participation, local assessment, and continuous improvement.

Swachh Survekshan has emerged as the **world's largest urban sanitation survey.** It **evaluates cities and states across sanitation and cleanliness** parameters. The survey has also evolved into an important governance tool under SBM-U. Swachh Survekshan acts as a catalyst by **encouraging healthy competition** among cities and States. This creates an incentive for local administrations to improve their sanitation performance. Citizen participation has also expanded significantly through the survey. Around **one lakh citizens provided feedback** during its first round in 2016. This increased to nearly **five crore citizens** during the sixth round in 2021. The survey therefore provides more than an assessment of sanitation outcomes. It creates a structured interface between citizens, local governments and sanitation systems.

At the community level, monitoring also supports the sustainability of behavioural change. SBM-G guidelines provide for continued engagement by **Nigrani Samitis, community leaders and Panchayat representatives** after ODF declaration.

The Continuing Journey of Swachhata

The journey of the **Swachh Bharat Mission (SBM)** reflects a progressive evolution in both sanitation practices and communication approaches. The initial emphasis was on creating awareness and generating demand for household toilets, followed by efforts to encourage their regular use and eliminate open defecation. As these gains were consolidated, the focus expanded towards sustaining **ODF status** and strengthening the management of solid and liquid waste. Communication evolved alongside these priorities, moving from awareness generation to deeper engagement and collective participation.

Collectively, these experiences reflect a consistent trajectory, from **information to engagement, from engagement to participation, and from participation to sustained community ownership.** Under SBM, communication has consequently become an integral part of the sanitation ecosystem, connecting people with infrastructure, institutions, and collective action. The larger objective is not merely to communicate the message of **Swachhata,** but to **nurture it as a sustained practice embedded in everyday community life.**

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02

From Beacons to Landmarks: India’s Changing Lighthouse Story

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For generations, India's lighthouses were places people saw from a distance. Standing at the edge of the sea, they marked dangerous stretches of coast and guided vessels through darkness. Their lights belonged to sailors. Their towers belonged to the landscape.

With a coastline stretching over 11,000 km and **205 lighthouses,** India is now reimagining these historic maritime guardians. Today, the lighthouse is becoming much more than a distant landmark. Its first purpose remains unchanged: helping vessels navigate safely along India's coastline. Around that enduring role, however, a new chapter is taking shape. Lighthouse stations are being upgraded and opened to the public. Their maritime stories are finding space in museums, while their surroundings are being developed with pathways, gardens, amphitheatres and other facilities. Modern systems are strengthening the infrastructure that keeps their lights working reliably.

Lighthouse tourism has risen from about **4 lakh visitors in 2014 to 18.63 lakh in 2024–25.** Across the country, **75 lighthouses** have been developed as tourism destinations to preserve their historical and architectural significance. Some of these include the Mandvi Lighthouse and Dwarka Lighthouse in Gujarat, Tadri Lighthouse in Karnataka, Pamban Lighthouse in Tamil Nadu, and Vizhinjam Lighthouse in Kerala. A digital ticketing portal has also been launched under the Directorate General of Lighthouses and Lightships (DGLL), bringing the visitor experience onto a common digital platform. The growing interest in lighthouse tourism is creating new spaces to showcase India's maritime legacy. These developments have also generated employment with nearby hotels, restaurants, tour operators, transport services, local shops, and artisans.



Vizhinjam Lighthouse



Dwarka Lighthouse

The Light Still Leads

The lighthouse may look much the same from a distance, but the technology behind its familiar beam has changed significantly. What once depended on fire and oil is now powered by the sun and strengthened by modern technology. All lighthouses in the country are solar-powered, making renewable energy part of the infrastructure that keeps these navigational lights working

The evolution can be traced through individual stations. At Samiyani Island in Gujarat, an oil lamp gave way to a solar-powered electronic flasher, followed by an LED lantern in 2016. At Jodiya, a solar-operated flashing light was introduced before being upgraded to a high-intensity LED lantern in 2021. Lighthouses have become part of India's wider maritime information network. **87 Automatic Identification System** (AIS) shore stations have been installed on lighthouses along the coast. This ensures that the beam remains dependable, responsive and ready to guide vessels safely. AIS is a ship and shore-based data broadcast system in accordance with SOLAS (International Convention for the Safety of Life at Sea). It is a powerful tool for enhancing situational awareness, thereby contributing to the safety of navigation and efficiency of shipping traffic management.

Lighthouse Museums: Bringing Maritime History Closer

While technology is strengthening the lighthouse's working role, its older stories are finding a place of their own. India has **dedicated lighthouse museums** at Chennai, Mahabalipuram, Alappuzha, Kannur, Muttom, Dwarka and Gopnath.

Mahabalipuram, also known as Mamallapuram, offers a particularly rich



Mahabalipuram Lighthouse

story, shaped by centuries of maritime activity along the Tamil Nadu coast. The Pallavas developed it as an important port during the seventh century AD for maritime trade with countries across Southeast Asia and the Mediterranean. A log fire once served as a guide for vessels approaching the coast. The first conventional lighthouse was established in 1887 on the roof of Olakkaneeswar Temple by placing a wick lamp inside a 4th-order optic and lantern. The Main light and emergency light source were modified to a cluster of three 150 W, 230 V metal halide lamps in 2004.

The present lighthouse is a 26-metre-high circular tower built with stone masonry. The tower itself has continued to evolve alongside the story it preserves. Its main light was upgraded to a **236-watt LED array in 2020,** the first of its kind. The result is a combination of living heritage and working technology. The museum showcases a history of lighthouses through engaging exhibits and rare artifacts. Its National Heritage and Maritime Museum brings the site's past into the visitor experience.

This museum-led approach is also being carried into larger projects.

At Lothal in Gujarat, the National Maritime Heritage Complex (NMHC) is set to include a **77-metre-high Lighthouse Museum.** It is planned as the tallest lighthouse museum and one of the largest maritime museums in the world, with an estimated cost of **₹266.11 crore.** NMHC is one of the most significant cultural and maritime initiatives. It seeks to revive and showcase India's maritime legacy spanning over five millennia. It will also include a 5D Dome Theatre, Coastal States Pavilion, a Museotel, an Eco Resort and a Maritime Research Institute (MRI) being developed with the Indian Maritime University (IMU). The lighthouse museum will captivate visitors with panoramic views of the entire complex. Its design draws inspiration from the Mahabalipuram Lighthouse, one of India's oldest lighthouses. The museum will retain its distinctive architectural character, with extensive use of stone. Carefully curated virtual reality (VR) walkthroughs will offer visitors glimpses into the history of Indian lighthouses along the vast coastline. A state-of-the-art sound and light show will illuminate the lighthouse using projection mapping technology.

Lothal itself is one of the country's most important archaeological sites associated with ancient maritime trade. A lighthouse museum like this connects the earliest traditions of seafaring with the evolution of modern aids to navigation. The story is also expanding along India's eastern coast. A new **Lighthouse Museum at Visakhapatnam** is planned at the Old Lighthouse area, with **3,156 square metres of land** earmarked for the project.

When the Lighthouse Becomes a Celebration

The transformation has also created something that a conventional project rarely produces: a festival around the lighthouse itself. The first edition was held at Fort Aguada in Goa in 2023. The second moved to Puri in Odisha in 2024, while the third edition was held in Visakhapatnam in 2026. The festivals have deliberately placed lighthouses within a wider cultural setting. The first Indian Lighthouse Festival brought maritime heritage to life through cultural exhibitions, sessions on maritime history, classical performances, musical evenings featuring celebrity singers, and coastal cuisine.

The idea of community participation gained particular emphasis in the second edition of the festival. At Puri, the



The Indian Lighthouse Festival in Goa

programme brought together lighthouse heritage with sand art, boat art, yoga, and folk dance & music. The event also highlighted Odisha's five tourism-developed lighthouses, Gopalpur, Puri, Chandrabhaga, Paradip and False Point. The Government announced plans to involve coastal communities in preserving, protecting and promoting lighthouse sites.

During the Indian Lighthouse Festival 3.0 in Visakhapatnam, the lighthouse had become the centre of an even broader celebration of coastal identity. Local crafts, coastal cuisine and night-time illumination added colour to the programme, while families, youth, artists, entrepreneurs, students and visitors brought the festivities to life. Their enthusiastic participation made the celebration more vibrant, inclusive and closely connected to the communities around the lighthouse.

At Aguada in Goa, this new approach has taken a distinctly modern form. **A light-and-sound projection mapping show** has been introduced at the historic lighthouse, using the structure itself as a canvas to tell a new story around an old landmark.



Aguada Lighthouse

A New Course for the Lighthouse

The idea is no longer confined to India's coastal towers. It is now reaching new locations, while giving existing lighthouse sites a wider role in public life. An additional **25 lighthouses are proposed for development as tourism destinations,** expanding the network beyond the 75 sites already opened to visitors. Four lighthouses are being established along the Brahmaputra at **Pandu, Bogibeel, Silghat and Biswanath Ghat.** They will be India's first lighthouse infrastructure on an inland waterway with a combined outlay of about **₹84 crore.** Each lighthouse will rise to **20 metres.** Solar power and weather-observation sensors will add modern capabilities to the navigational infrastructure.

Yet these lighthouses are being designed for more than navigation. Each site will include a **museum, amphitheatre, cafeteria, children's play area, souvenir shop and landscaped public spaces.** The idea is simple but significant: a lighthouse no longer needs to be only something that marks a vessel's course from afar. It can also become a place that brings people closer to the water, its history and its changing possibilities. From coastal towers that have stood for generations to new lights rising along the Brahmaputra, India's lighthouse story is moving into uncharted waters. The light continues to serve its purpose, while the lighthouse becomes a destination in its own right.

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03

Next-Gen GST Process Reforms

Towards Simpler, Faster and More Predictable Processes

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Introduction

Introduced on 1 July 2017, GST brought many Central and State taxes into a common framework. It marked a milestone in India's reform journey. It gave effect to the principle of "One Nation, One Tax" and helped move India towards an integrated tax system.

Over the past nine years, standardised procedures and rationalised rates have supported greater transparency, accountability and economic growth. They have also strengthened the vision of **'Ek Bharat - Shreshtha Bharat'.**

Building on this progress, the 56th GST Council recommended Next-Generation reforms to simplify the four-tier GST rate structure. The new structure has **two main rates,** 5% and 18%, and a special 40% rate for select goods and services.

This reform process has continued at the **57th meeting in October 2026.** The Council recommended further process reforms, clarifications on selected goods and services, and measures to facilitate trade and streamline compliance.

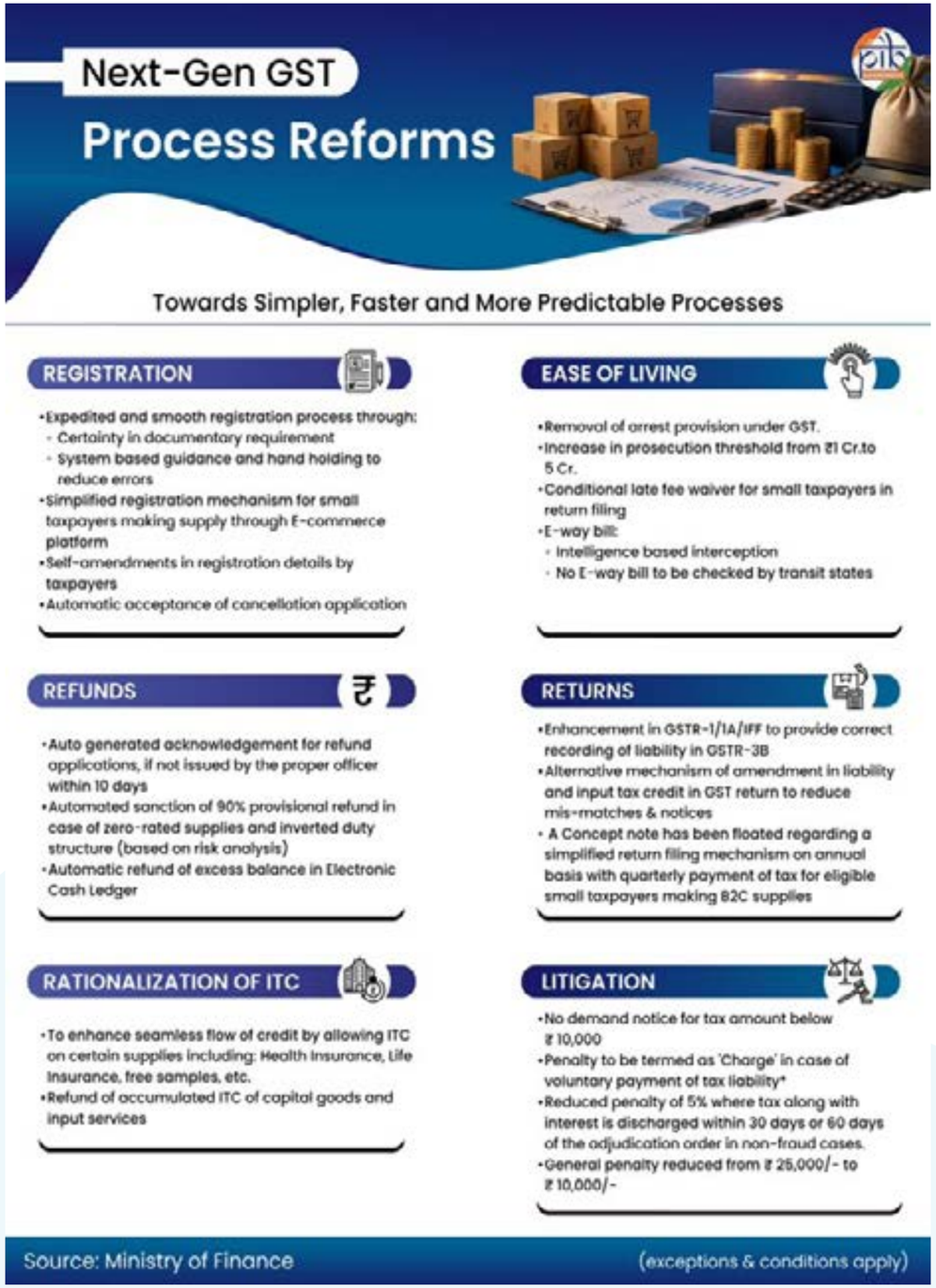
GST in Numbers: Wider Reach, Scale and Collections

A wider taxpayer base: Registered taxpayers increased from around **60 lakh in 2017 to ~1.70 crore as of September 2026.**

A large-scale digital tax system: As on 30 September 2026, the GST System had cumulatively processed 3,053 crore invoice uploads and 833.82 crore e-way bills.

Strong revenue growth: Gross GST collections reached **~₹12.46 lakh crore during April-September 2026,** registering an increase of **11.6%** Y-o-Y.





Making GST Registration Simpler, Faster and More Predictable

The proposals of the GST Council seek to create a more predictable and taxpayer-friendly GST registration framework. They are intended to support smoother business operations and encourage wider participation in the formal economy.

Reforms in the Registration process:

The GST Council recommended the following:

- A **comprehensive and detailed documentation along with FAQs** will be issued for processing registration applications.
- The **registration application will be amended** to simplify the filing process and improve clarity for taxpayers and tax officers.
- The **GST portal will provide a user-friendly interface** for filing registration applications, with clear navigational paths, drop-down lists, tool-tips and contextual guidance.

These measures would **facilitate correct filing of registration applications** and reduce **rejections and queries** raised in respect of such applications.

What is Input Tax Credit?

It is the credit a registered person can claim for tax on goods or services received.

For eg: If a manufacturer has paid tax of ₹10,000 on raw material purchase and collected tax of ₹25,000 on product sales. Consequently, the net tax payment amount is ₹15,000 and the manufacturer can claim the tax paid on raw material.

Automatic Acceptance

For easy and near real-time updation, the Council suggests **automatic acceptance of amendments to registration particulars.** This would be enabled on the portal, except for changes relating to the **Principal Place of Business (PPoB).**

What is Principal Place of Business?

Section 2(89) of the CGST Act, 2017 defines it as follows: "principal place of business" means the place of business specified as the principal place of business in the certificate of registration".

For taxpayers registered through the **automatic route,** amendments to **all registration particulars, including PPoB,** would be accepted automatically.

Registration Cancellation Process

To simplify the registration cancellation process, the Council recommended amendments in the CGST Act, 2017 and the CGST Rules, 2017. The proposal includes

- **Automatic cancellation:** To reduce the officer's interface the Council proposed the reforms in phased manner.

Phase 1
The cancellation applications would be **accepted automatically** after pending returns are filed and all dues are paid.

- This would apply to taxpayers who have **not passed on ITC exceeding ₹2.5 lakh in any month.**
- It would also apply where **ITC exceeded ₹2.5 lakh in a month,** if the final return is filed within the specified time.

Phase 2
All the applications for cancellation of registration will be accepted automatically by the system, once all pending returns are filed and all dues are paid. FORM GST REG-16 will be amended so that the details of FORM GSTR-10 can be furnished in the said application itself.

- **Suo-moto cancellation:** To expedite the process of cancellation certain grounds for cancellation of registration by tax officers would be removed, reducing intervention.

A **system-based mechanism would enable cancellation and revocation based on non-compliance and subsequent compliance.** The mechanism covers defaults relating to non-filing of returns or non-furnishing of bank account details within the specified time.





Reform for E-commerce sellers

The reforms suggested by the GST Council provide a **simplified registration mechanism for small taxpayers making supply through E-commerce platforms.**

Small sellers passing ITC not more than ₹2.5 lakh/month (excluding stock transfer) can opt for simple registration (PAN based) in States/UTs other than their Home State/UTs.

The electronic commerce operator (ECO) warehouse can be declared as the PPoB in a State/UT where there is no physical presence.

This would facilitate ease of doing business for small e-commerce sellers by enabling them to establish their businesses in other States.

GST Return Reforms for Improved Accuracy and Compliance

To reduce mismatches and improve the integrity of ITC across the supply chain, the Council recommended streamlining the return filing process. This would enable more accurate reporting of tax liability and ITC while **reducing compliance burden.** Following are the proposals of Council:

- GSTR-1/1A/IFF would be enhanced to enable better reconciliation with GSTR-3B.
- A facility **"Electronic Statement of tax paid on Reverse charge basis and input tax credit claimed"** would facilitate correct reporting of tax liability and **ITC on supplies liable to reverse charge.**
- A mechanism would enable **reporting/ correction of liability** in GSTR-3B to align with details reported in **GSTR-1/1A/IFF.**
- **GST DRC-03 would be amended** to allow declaration of the **underlying invoice details** for which the payment has been made.
- The **Invoice Management System (IMS)** would allow recipients to **accept, reject or keep documents pending** for ITC reporting.
- An **Electronic Credit Reversal and Reclaim Statement** would facilitate correct reporting of I**TC reversed and reclaimed.**
- A mechanism would enable **reporting/correction of ITC reported in GSTR-3B** to align with ITC available in **GSTR-2B.**
- Clarifications would be issued on reporting **ITC and its reversal** in GSTR-3B in the form of circular.

The alternate mechanism for correcting **liability and ITC** is proposed to apply from the **April 2027 return period.**

GSTR-1: Form GSTR-1 is a monthly/quarterly Statement of Outward Supplies to be furnished by registered taxpayers making outward supplies of goods and services or both and contains details of outward supplies of goods and services.

GSTR- 1A: A taxpayer who needs to amend any supply record furnished in GSTR 1 or need to add any supply record, the same can be done through GSTR 1A.

IFF: Invoice Furnishing Facility (IFF) is an optional facility provided to taxpayers who are in QRMP (Quarterly Return and Monthly Payment) scheme, to file their details of outward supplies in first two months of the quarter (M1 and M2), to pass on the credit to their recipients

GSTR-3B: It is a simplified summary return. The purpose of the return is

for taxpayers to declare their summary GST liabilities, ITC availed etc. for a particular tax period and discharge these liabilities.

GST DRC-03: It is a payment form. It is utilized by taxpayers to make payments towards tax, interest, penalty, fee or any other amount due under the GST Act.

GSTR-2B: GSTR-2B is an auto-drafted ITC statement which is generated for every normal taxpayer on the basis of the information furnished by his suppliers in their respective forms. The statement indicates availability and non-availability of input tax credit to the taxpayer against each document filed by his suppliers.

Streamlining GST Refunds through Faster, System-Based Processing

The reforms proposed by the GST Council provide for system-based processing and sanctioning of refund claims. This would enable faster processing, greater transparency and reduced manual intervention.

Phase 1
Refunds of excess cash ledger balances would become automatic, facilitating faster availability of funds for businesses.

The **acknowledgement period would be reduced from 15 to 10 days.** Deemed acknowledgement will apply where no response is issued.
Based on risk assessment, **90% of claimed amount is expected to be sanctioned,** for refund claims on account of zero-rated supplies and inverted duty structure.

Phase 2

- System-based automated acknowledgment (without officer intervention) on due verification of the refund application by the system for refund claims on account of zero-rated supplies and inverted duty structure.

In such acknowledged cases, automated sanction of full refund claim by the system (without officer intervention), in respect of claims pertaining to zero rated supplies only, after adjusting pending dues, if any, on the basis of identification and evaluation of risk by the system.

Measures to Expedite and Streamline Refunds

- Amendment in refund application in FORM GST RFD-01 . This will capture refund details in a system-readable format in case of refund claims pertaining to **zero-rated supply** and inverted duty structure.
- Amendment in rule **89(4)(C) of the CGST Rules, 2017.** This will remove the cap limiting the turnover of zero-rated supply of goods to 1.5 times the value of like goods supplied domestically.

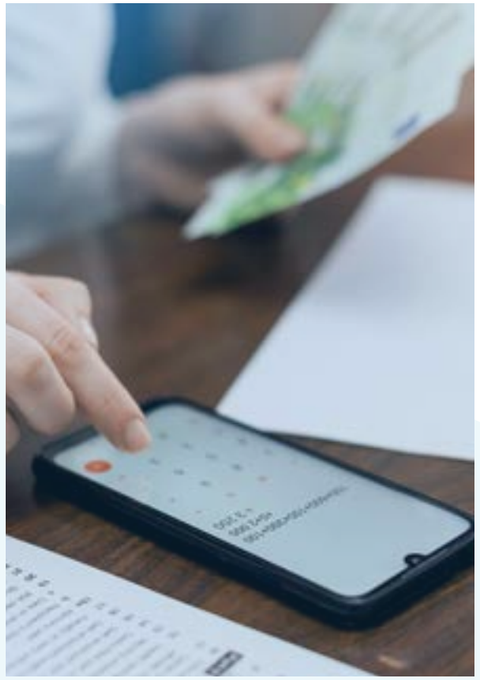
What is zero-rated supply under GST?

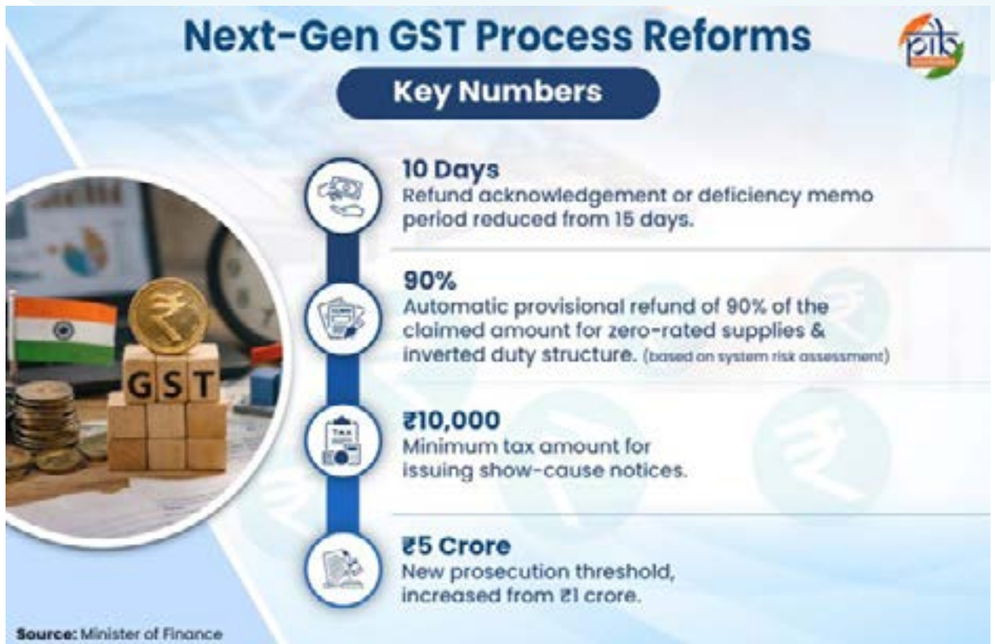
This includes exports of goods or services and supplies made to an Special Economic Zone (SEZ) developer or SEZ unit.

- Amendment in **section 54(14) of the CGST Act, 2017.** The ₹1,000 refund threshold will apply to the total refund amount, including CGST, SGST/ UTGST and IGST.

Clarity on Interest on Refund of Pre-Deposit

- Amendment in section **115 of the CGST Act, 2017.** This will make it a standalone provision which will specify the rate of interest applicable to refunds of pre-deposit amounts paid for filing appeals.
- A circular will also be issued to clarify concerns relating to the rate of interest applicable to such refunds.





Reforms to Simplify Dispute Resolution and Reduce Litigation

The council recommended a circular with the comprehensive guidelines for the tax officers. This circular will include streamlined process of demand notices, adjudication orders and appeal orders. The other reforms suggested by the GST Council aim to streamline dispute resolution, reduce compliance burden and litigation. The proposals include the following:

- **No show cause notices will be issued if the tax amount involved is less than ₹10,000.** Pending notices on the date of the provision and appeals involving amounts below ₹10,000, will be decided based on the ₹10,000 minimum threshold, as if it were applicable when the notice was issued.
- The **penalty will be termed as 'Charge'** in cases full tax amount is voluntary paid with interest and penalty, within the specified time limit.
- A **reduced penalty of 5%** will apply where tax and interest are discharged within 30 days (under section 73) or 60 days (under Section 74A) of the adjudication order.
- The **minimum penalty of ₹10,000 to be removed,** in non-fraud cases.
- **The maximum general penalty would be reduced** from ₹25,000 to ₹10,000.

In cases where the order only involves penalty and no demand of tax, an **upper limit of ₹40 crore** would be provided on account of pre-deposit for appeals before the Appellate Authority or Appellate Tribunal.

Other major reforms under GST

Widening Access to ITC Refunds and Claims

Broader refund eligibility

The GST Council recommended changes to the CGST Act and Rules to allow refunds of accumulated ITC in specified cases.

This would ease taxpayers' working capital constraints and reduce the blockage of ITC on input services and capital goods in these cases.

Easing restrictions on blocked ITC

The Council recommended amendments to remove restrictions on claiming ITC for certain supplies.

This includes Outdoor Catering. Health and Life Insurance, Telecommunication Towers, Pipelines outside factory Premises, Free Samples and Goods destroyed or written off after their shelf life expires (as required by law).

The change would reduce cascading

Table-1: Expanded ITC Refund Eligibility

ITC type	Eligible cases	Applicability
Capital goods	Zero-rated supplies and inverted duty structure	On or after 1 April 2027; refunds spread over 60 months for refunds on account of ITC availed on capital goods.
Input services	Inverted duty structure	On or after 1 November 2026

taxes and support a smoother flow of ITC across the supply chain.



Reforms relating to exports/zero-rating of supplies of goods and services

The Council recommended changes to export status, place-of-supply rules and payment clarifications, alongside zero-rating guidance for specified SEZ/FTWZ deliveries.

- **Services supplied through foreign offices or branches:** The Council recommended to remove the condition that the supplier and recipient must not be establishments of the same person for a service to qualify as an "export of services."

  The change would **facilitate refunds for Indian service providers** supplying services to or through their foreign offices or branches. It would also support services exports from India.
- **Payment for exports:** A circular shall be issued clarifying that payment for exports of goods and services may be received in foreign exchange or in Indian rupees, where permitted.
- **Place of supply for certain services:** For services where the recipient makes goods physically available to the supplier, the Council recommended determining the place of supply based on the recipient's location under the default rule in **section 13(2).**

  This will facilitate access to export-related benefits under GST for Indian service providers providing such services to foreign recipients.
- **Goods delivered to overseas buyers in an SEZ or FTWZ:** The Council recommended treating goods supplied to overseas buyers but delivered to an SEZ or Free Trade & Warehousing Zone (FTWZ) , as zero-rated supplies. This would apply when payment is received in convertible foreign exchange or in Indian rupees where permitted by the RBI.

The provision would **clarify the availability of zero-rating benefits** for Indian manufacturers making such deliveries, on the directions of their overseas customers, for warehousing or further processing inside the SEZ unit.

- **Raising the prosecution threshold** from ₹1 crore to ₹5 crore.



Ease of living and doing business

The recommendations seek to balance effective enforcement with taxpayer protections and smoother movement of goods.

Rationalization of provisions relating to arrest and prosecution

The Council recommended withdrawing certain arrest powers under GST. To strengthen a progressive, trust-based tax regime while maintaining deterrence against fraud and evasion, the Council also recommended:

- **Removing specified offence provisions and wording** from section 132(1) of the CGST Act, 2017:
  - > Remove clause (i), i.e., remove the offence for receiving, helping supply or dealing in services a person knows, or has reason to believe, violate the Act.
  - > Delete "evades tax" from clause (e); and
  - > Delete "or in any other manner deals with" from clause (h).
- To amend clause (c) section 132(1) of the CGST Act, 2017, so as to cover

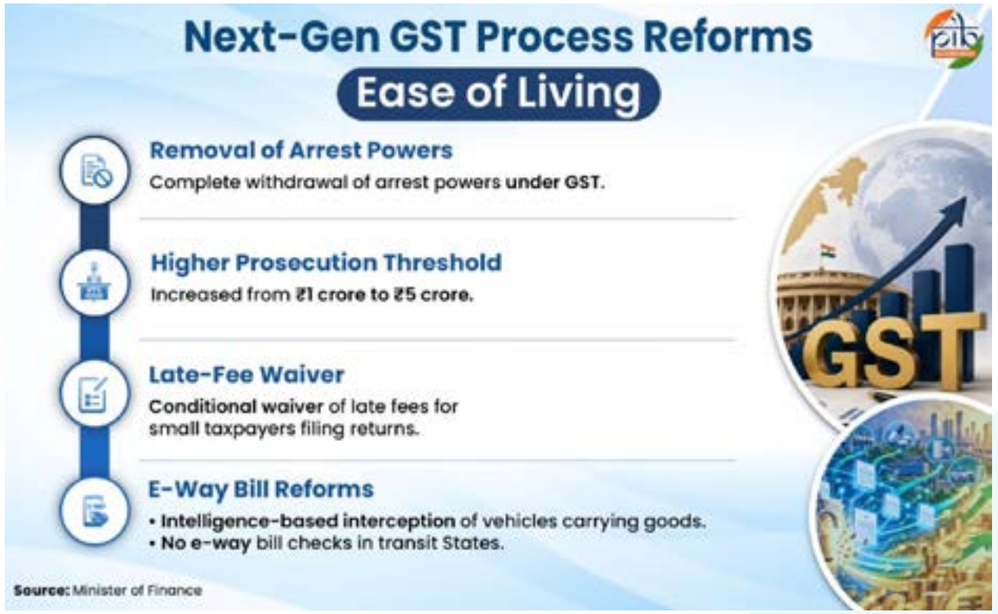
only offence of fraudulent availment of ITC without receiving the goods or services, or without an invoice or bill.

Rationalising provisions relating to e-way bills

The Council recommended the following amendments:

- **Interception conditions:** A conveyance carrying goods could be intercepted only on specific intelligence and with authorisation from an officer of at least Joint Commissioner rank.
- **State jurisdiction:** Inspection and further action, such as detention or seizure, could be taken only if the supplier or recipient is located or registered in the State where the interception takes place. Goods could not be intercepted in transit States.
- **Missing documents exception:** If no e-way bill has been generated, or the conveyance carries no document showing the goods' origin or destination, the goods could be inspected, detained or seized regardless of jurisdiction.
- **No confiscation in transit:** Goods/ conveyances in transit would not be subject to confiscation under **section 130** of the CGST Act.

This would support smoother movement of goods and conveyances and improve supply and transportation efficiency for businesses.



Treatment of transfer of title in intellectual property rights (IPR)

The Council recommended treating the transfer of IPR title, whether temporary or permanent, is treated uniformly as a supply of services.

This would ease GST compliance and support smoother cross-border IPR transactions.

Opportunity to be heard before blocking ITC under Rule 86A of the CGST Rules, 2017

The Council recommended allowing taxpayers to **file an objection to amounts blocked in their electronic credit ledger.**

The taxpayer would also be able to attend a personal hearing before the proper officer decides on the objection.

Late-fee relief for small taxpayers

The Council recommended **waiving late fees for delayed returns** for taxpayers with turnover of up to ₹5 crore in the previous financial year.

The waiver would apply if the delayed return is filed by the end of the month in which it was due.

Clarification of various issues through circulars

The GST Council recommended issuing circulars to clarify the following issues arising from differing interpretations by field formations:

- Input Service Distributor (ISD) distribution of input service credit
- ITC claims by banks, financial institutions and NBFCs opting for section 17(4)
- Payment of pre-deposits
- ITC on demonstration vehicles in certain situations
- The effective date of omission of rule 96(10): 23 October 2017, in line with the Supreme Court's decision

Introduction of a concept note for an ARQP scheme

The GST Council introduced a concept note for an **optional Annual Return Quarterly Payment (ARQP) scheme for further deliberations and discussions.** It is intended for taxpayers with aggregate turnover of ₹5 crore or less in the preceding financial year who make supplies exclusively to unregistered persons (B2C supplies).

Streamlining GST compliance

The Council made the following recommendations:

- **Clarifying tax liability of e-commerce operators:** The Council recommended **amending section 9(5) of the CGST Act, 2017** so that that e-commerce operators are liable to pay tax on notified services, regardless of their business model.
- **Extending e-invoicing requirements:**

Extend e-invoicing to domestic supplies received from unregistered persons where tax is payable under the reverse charge mechanism, and to imports of services. This would apply to taxpayers with aggregate annual turnover of ₹5 crore or more.

Aligning GSTAT provisions with tribunal reforms



The Council approved amendments to the **CGST Act, 2017** and the **GSTAT (Appointment and Conditions of Service of President and Members) Rules, 2023.**

These amendments would align provisions on the GST Appellate Tribunal with the **Tribunals Reforms Act, 2026** and the **National Tribunals Commission and Qualification, Selection and Conditions of Service of Chairpersons and Members of Tribunals Rules, 2026.**

Changes/ Clarifications in relation to GST rates on Goods and Services

The GST Council recommended changes to GST treatment across various goods and services.

Table-2: Recommended GST Treatment for Goods

Items covered	Recommended reform
Sublimation paper	Clarify that sublimation paper is classified under heading 4809 and regularise past cases on an "as is where is" basis.
Toys	Clarify that the notification entries related to rate on toys covers to all categories of toys under heading 9503 of the Customs Tariff Act and are not restricted to tricycles, scooters, pedal cars only.
Sea-weed extract-based bio-stimulants	Clarify that sea-weed extract based bio-stimulants, which are registered under Schedule VI to the Fertiliser (Inorganic, Organic or Mixed) (Control) Order, 1985, are classifiable as fertilisers under heading 3101
Second-hand vehicles	Under the GST margin scheme, suppliers may claim ITC on inputs other than procured second-hand vehicles, and on input services. The restriction applies only to tax paid on procured second-hand vehicles.
Specified Waste and, scrap of plastics, waste and scrap of tyres, electrical and electronics waste and scrap, and used cooking oil	Reverse Charge Mechanism (RCM) would apply when an unregistered person supplies such specified waste and scrap to a registered person. The supplier must register upon crossing the threshold, while the recipient must pay the tax even if the supplier is below it. Apply 2% TDS to registered-to-registered supplies of such specified waste and scrap.
Psyllium seeds (Isobgul/Isabgol)	NIL GST rate prescribed, whether fresh, chilled, frozen or dried.
Re-treaded tractor tyres	GST rate on retreaded tractor tyres aligned with that of new tractor tyres.
Two- and four-wheelers	Exempt the Compensation Cess not levied by Canteen Stores Department (CSDs) from 01.07.2017 to 30.09.2022.
Aerated drinks	Exempt the Compensation Cess not levied by CSDs and Unit Run Canteens from 01.07.2017 to 31.03.2022.

Table-3: Recommended GST Treatment for Services	
Services covered	**Recommended reform**
Passenger transport and rental of motor vehicles using electric vehicles (EV)	Provide option to pay 5% GST with restricted ITC for services of passenger transportation and renting of motor vehicles (with operator) provided using electric vehicle, where the cost of battery charging is included in the consideration.
Delivery services supplied through an electronic commerce operator (ECO)	Bring delivery services, other than courier or postal, supplied through an ECO under Section 9(5) of CGST Act, 2017, when the service provider is not required to register under section 22(1) of the CGST Act, 2017, at 5% GST rate without ITC
Delivery services for goods supplied or ordered through an ECO	Prescribe 5% GST rate without ITC on delivery services for goods, where such goods are supplied or ordered through an ECO.
Services of transportation of goods by Goods Transport Agency (GTA) to unregistered persons in relation to goods supplied or ordered through an ECO	Deny the exemption available under Entry 21A of Notification No. 12/2017 – CTR for services of transportation of goods by GTA in relation to goods supplied or ordered through an ECO.
Motor vehicle leasing	Clarify that the GST treatment of statutory and ancillary charges, such as registration, road tax, insurance and FASTag charges, recovered by lessors from the lessee are incidental to the principal supply of leasing of motor vehicles.
Restaurant, outdoor catering, hotel accommodation for value up to Rs. 7500 per unit per day and gym or fitness services	To allow input tax credit in the same line of business, for the supply of restaurant/outdoor catering services, hotel accommodation services for value up to Rs. 7500 per unit per day, and gym/fitness services
Passenger transport by helicopter on seat-sharing basis	Exempt the services of passenger transportation by air in a helicopter on seat-sharing basis to or from airports or helipads located in the North-Eastern States, Sikkim and at Bagdogra, West Bengal.
Storage or warehousing of seeds meant for sowing	To exempt from GST the services of storage/ warehousing of seeds meant for sowing.
Curing of coffee	To exempt from GST the agricultural support services of coffee curing provided by coffee curers to cultivators.
Services of the Seamen's Provident Fund Organisation (SPFO)	To exempt from GST the services provided by SPFO to persons governed by the Seamen's Provident Fund Act, 1966.
Research and Development services	A simple mechanism of Self-certification by the head of the institution undertaking research and development services to certify that the activity is in the nature of research and development and not consultancy, for the purpose of claiming exemption available to R&D services.

Services imported by Indian establishments of foreign shipping lines from its offices located abroad	To exempt import of services made without consideration by an Indian establishment of a foreign shipping company from a related person or any of its establishments outside India. The past period to be regularised on an *"as is where is"* basis.
Grant of exclusive rights to demand, collect and appropriate toll fees	The service of granting a concessionaire the exclusive right, license and authority to demand, collect and appropriate toll fees for a highway project to be exempt from GST. This applies when the Government, including local authorities, governmental authority or government entities, grants such rights to a concessionaire.
Operation and Maintenance (O&M) services for highway projects under the TOT model	Provide a special procedure regarding the valuation and time of payment of GST on O&M services provided by concessionaires to the concessioning authority for highway projects in TOT model
Fund Transfer Pricing (FTP) transactions between bank branches	To clarify that the notional amount recorded as "interest" in the books of accounts of the banks for the activity of notional transfer of funds between the branches of the banks by the head office as part of Funds Transfer Pricing transactions is covered by the definition of **"interest"**, given in Notification No. 12/2017-CT(Rate) dated 28.06.2017.

Conclusion

The 57th GST Council meeting's recommendations address concerns across registration, returns, refunds, input tax credit and dispute resolution. They also seek to strengthen trade, clarify tax treatment and widen opportunities for small sellers and service exporters.

These recommendations build on GST's success and mark another step in its continued improvement. Together, these measures would further promote ease of doing business and contribute to a more efficient and taxpayer-friendly GST framework.

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04

Khelo India Sports Goods Manufacturing Scheme

Building a Globally Competitive Sports Manufacturing Ecosystem

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The Union Cabinet approved the Khelo India Sports Goods Manufacturing Scheme on 28 October 2026 with an outlay of ₹1,856.67 crore for FY 2026-27 to FY 2033-34. Dedicated Sports Goods Manufacturing Zones will bring manufacturers, suppliers, testing facilities and design centres together in one place. Support for anchor investment and turnover-linked production, with a combined outlay of ₹1,130 crore, will draw new investment and raise production. A further ₹105 crore will help manufacturers obtain and renew certification from International Sports Federations. Centres of Excellence, start-up support, skilling and export promotion complete a scheme that aims to make India a global hub for high-quality sports goods.

Introduction

India's sporting ambitions are creating opportunities that extend from playgrounds and training centres to manufacturing and enterprise. Initiatives such as **Khelo India** and **Khelo Bharat Niti 2025** are strengthening participation, talent development and sports infrastructure. A strong sports goods industry can support this vision by supplying quality equipment while creating opportunities for skills, employment and exports.

India's sports goods manufacturing base draws on established clusters such as **Jalandhar (Punjab) and Meerut (Uttar Pradesh),** skilled workers and a network of entrepreneurial MSMEs. Small and micro enterprises account for nearly **90% of production,** making the sector an important avenue for local enterprise and employment. The global sports equipment market, valued at approximately **US$140 billion in 2024,** is projected to reach around **US$283 billion by 2036,** offering substantial opportunities for Indian manufacturers to expand their presence.

To build on these strengths, the Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved the **Khelo India Sports Goods Manufacturing Scheme,** with a total outlay of **₹1,856.67 crore for the period FY 2026-27 to FY 2033-34.** Announced in the Union Budget 2026-27, the scheme brings together support for investment, technology, innovation, skills and market development to position India as a globally competitive hub for the design, development and manufacture of sports goods. The Budget Speech 2026-27 noted that "India has the potential to emerge as a global hub for high quality, affordable sports goods."

Key Interventions under the Scheme

The scheme provides support across the sports goods manufacturing value chain, from infrastructure and investment to research, skills, certification and market development. It has two parts: incentives that support manufacturing and interventions that build the wider ecosystem.

- **Developing integrated manufacturing zones: The integrated Sports Goods Manufacturing Zones (SGMZs)** will bring together manufacturers, suppliers, testing facilities, design and prototyping centres, and ancillary enterprises. Developed through convergence with the **BHAVYA Scheme and NICDC Industrial Parks,** these zones will strengthen industry linkages and improve manufacturing efficiency. There may be **four such integrated zones, each covering more than 300 acres.**

- **Attracting investment and expanding production:** Two components, with a **combined outlay of ₹1,130 crore,** will support manufacturing growth. **Anchor Investment Support** will provide **20% capital expenditure support to anchor investors investing at least ₹100 crore,** encouraging leading domestic and global manufacturers, brands and retail chains to establish manufacturing facilities within Sports Goods Manufacturing Zones (SGMZs). **Turnover Linked Support** will offer **incentives of up to 15% to manufacturers investing ₹10 crore or more,** encouraging higher production and capacity expansion.

- **Upgrading existing clusters and supporting MSMEs:** Existing sports goods manufacturing clusters will receive support for upgrading **common facilities and shared infrastructure through cost-sharing with States,** helping smaller enterprises strengthen their manufacturing capabilities.

- **Supporting international certification:** An outlay of **₹105 crore** will help manufacturers obtain and renew certifications from International Sports Federations. Support will cover **70% of first-time certification costs and 50% of renewal costs,** promoting internationally accepted quality and performance standards and facilitating global market access.

- **Advancing research and start-up innovation: Centres of Excellence** in premier educational and research institutions will support research in sports equipment, material sciences, protective gear and advanced manufacturing technologies. Research co-funding will be encouraged through

convergence with the **Anusandhan National Research Foundation. DPIIT-registered sports start-ups will be eligible for grants of up to ₹20 lakh.** Aligned with **Startup India,** this support will facilitate the development, testing, validation and commercialisation of new technologies, processes and products.

- **Developing industry-aligned skills:** Skill development initiatives will be implemented in collaboration with the **Ministry of Skill Development and Entrepreneurship** and relevant industry stakeholders to meet evolving workforce requirements.

- **Promoting Indian sports goods globally:** An **India Sports Expo and a Brand India campaign,** alongside branding, outreach and market development initiatives drawing on the **Export Promotion Mission,** will strengthen the visibility of Indian sports goods and support wider access to international markets.



Strengthening India's Sports Goods Manufacturing Base

India's Sports Goods Industry Today

India's sports goods industry combines established manufacturing skills with a broad network of small enterprises. Its strengths extend beyond individual products to clusters of manufacturers, suppliers and household units serving domestic and international buyers.

- **An established manufacturing network:** Jalandhar and Meerut together comprise **over 250 exporting units, more than 1,000 domestic-market units, over 4,000 micro enterprises and nearly 20,000 household units.** Other centres include Ludhiana for bicycles and Delhi and Mumbai for sports accessories and apparel.

- **Strong MSME participation:** Nearly **90% of production** is undertaken by small and micro enterprises. This makes growth in sports manufacturing closely connected with entrepreneurship, local livelihoods and employment.

- **Products with an international presence:** India manufactures cricket bats, protective gear, inflatable balls, and gym and athletic training equipment. The **United Kingdom, United States and Australia together receive over half of India's sports equipment exports,** providing established connections with major overseas markets.

- **Areas of strength:** India-based brands and manufacturers together account for about 75 to 80% of the global cricket bat market, and India holds an estimated 30 to 35% of the cricket helmet market.

- **Opportunities across related industries:** Sports equipment production draws on capabilities in rubber, polymers, composites, wood and metals. Shared materials, machinery and skills create opportunities to diversify products and strengthen supplier networks across industries.

- **Scope to serve domestic and global demand:** India's domestic sports goods market is estimated at **US$2.5 billion,** including approximately **US$0.5 billion in equipment.** Globally, equipment exports reached around **US$52 billion in 2024,** offering opportunities to expand beyond India's existing equipment exports of **US$275 million.**

- **Significant long-term potential:** India's sports equipment exports could reach approximately **US$8.1 billion by 2036,** potentially generating around **54 lakh additional direct and indirect jobs.**

- **A decade of major events:** the Los Angeles Olympics 2028, the Commonwealth Games 2030 in Ahmedabad, the Brisbane Olympics 2032 and India's planned bid for the 2036 Olympic Games create a decade of demand for sports equipment.

Together, these strengths provide a foundation for expanding production, developing higher-value equipment and building a greater international presence. Technology, testing, certification and industry partnerships can help translate this potential into manufacturing growth.

Building on These Strengths through the New Scheme

The Khelo India Sports Goods Manufac-

turing Scheme brings together support across the manufacturing value chain. Its interventions address the following priorities:

- **Stronger Domestic Manufacturing:** Integrated manufacturing zones and investment and production support will encourage capacity expansion, strengthen supplier networks, increase domestic value addition and reduce import dependence.
- **Growth of MSMEs:** Upgradation of existing clusters, common facilities and shared infrastructure will support smaller enterprises.
- **Better Quality and Innovation:** Research centres, technology development, start-up support and international certification will strengthen product development and quality.
- **Skills and Employment:** Training aligned with industry requirements will help develop a skilled workforce and support employment across the value chain.
- **Greater Global Competitiveness:** Branding, outreach and market development will help Indian sports goods reach international buyers.
- **Support for India's Sporting Ambitions:** High-quality, internationally certified equipment will support the sports sector and athlete development programmes, complementing Khelo India and Fit India.



Convergence with National Schemes and Initiatives

The scheme builds on existing national initiatives to connect manufacturing infrastructure with research, skills and export opportunities. It also supports the wider goal of strengthening India's sporting ecosystem.

Manufacturing Infrastructure

- **BHAVYA:** The Bharat Audyogik Vikas Yojna provides for 100 plug-and-play industrial parks with an allocation of ₹33,660 crore. Facilities such as ready-built factory sheds, testing laboratories and warehousing provide the infrastructure needed by manufacturers. The scheme's Sports Goods Manufacturing Zones will be developed through convergence with infrastructure under the BHAVYA Scheme.
- **National Industrial Corridor Development Corporation Limited (NICDC):** NICDC helps develop industrial cities with land, roads, power, water and transport links for manufacturers. Its industrial corridor programme covers **20 industrial smart cities across 13 States,** with four completed as of September 2026. The sports goods scheme will use infrastructure in NICDC Industrial Parks to develop manufacturing zones that bring manufacturers, suppliers and supporting facilities together.

Research and Innovation

- **Anusandhan National Research Foundation:** ANRF supports research and collaboration between educational institutions, research organisations and industry. Convergence with ANRF will encourage R&D in the sports goods sector, alongside the scheme's support for Centres of Excellence working on equipment, materials, protective gear and manufacturing technologies.
- **Startup India:** Startup India supports new enterprises through seed funding, investment and credit guarantees, helping ideas progress into viable businesses. As of **31 March 2026,** India had over **2.23 lakh recognised start-ups,** which had generated more than **23.36 lakh direct jobs.** The sports goods scheme's dedicated start-up support will align with this wider ecosystem to encourage innovation in equipment, materials and manufacturing processes, from development and testing to validation and commercialisation.

Export Promotion

- **Export Promotion Mission:** With an outlay of **₹25,060 crore for 2025-26 to 2030-31,** the Mission brings together export finance, quality compliance, logistics and market-access support, particularly for MSMEs and first-time exporters. Its two components, **Niryat Protsahan** and **Niryat Disha,** help exporters access finance, meet international standards and connect with overseas buyers through trade fairs, buyer-seller meets and warehousing facilities. The sports goods scheme will draw on this wider framework for branding, outreach and market development, helping Indian manufacturers strengthen their international presence.

Sports Development

- **Khelo India and Fit India:** Khelo India supports participation, talent development, training and sports infrastructure, while Fit India promotes fitness and an active lifestyle. The manufacturing scheme will complement these efforts by strengthening the capacity to produce high-quality, internationally certified sports goods for India's sports sector and athlete development programmes.

Khelo India Scheme

- **Launched in 2017:** brought the Rajiv Gandhi Khel Abhiyan, the Urban Sports Infrastructure Scheme and the National Sports Talent Search Scheme into one framework for sports development.
- **Five pillars:** training centres to identify talent; capacity building for coaches and support staff; sports science and technology; competitions and leagues; and sports infrastructure.
- **Reach as of July 2026:** 349 sports infrastructure projects approved with an investment of ₹3,176 crore; 1,067 Khelo India Centres; 267 academies supported; and 2,745 Khelo India Athletes supported with coaching, equipment, medical care and a monthly allowance.

Policy Alignment

- **Khelo Bharat Niti 2025:** The policy recognises sport as a driver of economic growth, including through entrepreneurship, investment and sports start-ups. The manufacturing scheme supports this approach by connecting sporting development with opportunities for production, innovation, employment and exports.

Khelo Bharat Niti 2025

- **National sports policy:** uses sport for nation-building, economic growth and social inclusion, in line with the vision of Viksit Bharat.
- **Grassroots to elite:** early identification and nurturing of talent, competitive leagues, and infrastructure in rural and urban areas.
- **Sport for all:** sport in the school curriculum under the National Education Policy 2020, and wider participation of women, marginalised groups, tribal communities and persons with disabilities.

- **Make in India, Atmanirbhar Bharat and Viksit Bharat@2047:** By expanding domestic manufacturing, increasing value addition and reducing import dependence, the scheme supports Make in India and Atmanirbhar Bharat. Its focus on investment, employment and exports also contributes to the vision of Viksit Bharat@2047.

Production Linked Incentive Scheme: Supporting Manufacturing Growth

The production Linked Incentive (PLI) schemes reward incerases in production and sales across **14 sectors,** encouraging investment and competitive manufacturing.

As of **June 2026,** these schemes had:

- Attracted **₹2.6 lakh crore in investment.**
- Generated **₹23.8 Lakh crore in production and sales.**
- Supported **over ₹15.5 Lakh crore in exports.**
- Created **14.6 Lakh Jobs.**

Towards a Global Hub for Sports Goods

The scheme is expected to position India as a globally competitive hub for the design, development and manufacture of sports goods. By strengthening manufacturing, promoting innovation and widening access to global markets, it will create new opportunities for growth, employment and exports, and support India's aspiration to emerge as a leading sporting nation.

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Anusandhan National Research Foundation

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05

Pumped Storage Hydropower

Powering India’s Clean Energy Transition

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As clean energy reshapes India's power landscape, a timeless technology is paving the way for a powerful new energy future. Often described as a water battery, pumped storage uses water and gravity to store electricity, bridging the gap between when power is generated and when it is needed. From reservoirs to modern grids, it is helping shape a cleaner, more reliable and resilient energy future.

Building India's Energy Future with Storage

India's energy transition is increasingly anchored in renewable energy to strengthen energy security and sustainability. The country is rapidly expanding solar and wind capacity to meet rising electricity demand with cleaner sources. As of July 2026, India has crossed 300 GW of installed non-fossil fuel-based electricity generation capacity. During FY 2025–26, India added around 55.29 GW of non-fossil fuel capacity. India has also set a target of 500 GW of non-fossil fuel capacity by 2030. Solar and wind energy are going to make major contributions towards achieving this target.

However, renewable energy generation varies with sunlight, weather and daily demand patterns. This variability creates a growing need to store electricity when renewable generation exceeds demand. Energy storage can then supply electricity during periods of low renewable generation or peak demand.

As renewable capacity expands, the requirement for energy storage would also increase rapidly. The Central Electricity Authority (CEA) projects 73.93 GW of storage capacity by 2031–32. This includes 26.69 GW from Pumped Storage Projects (PSPs) and 47.24 GW from Battery Energy Storage Systems (BESS).

PSPs can play a crucial role in meeting this long-duration storage requirement. PSPs store electricity by pumping water to an upper reservoir during periods of surplus generation. The stored water is released through turbines when electricity demand rises. This enables PSPs to shift renewable electricity across time and support grid stability. They also provide long-duration storage and peaking support, making them important for integrating large renewable capacities.

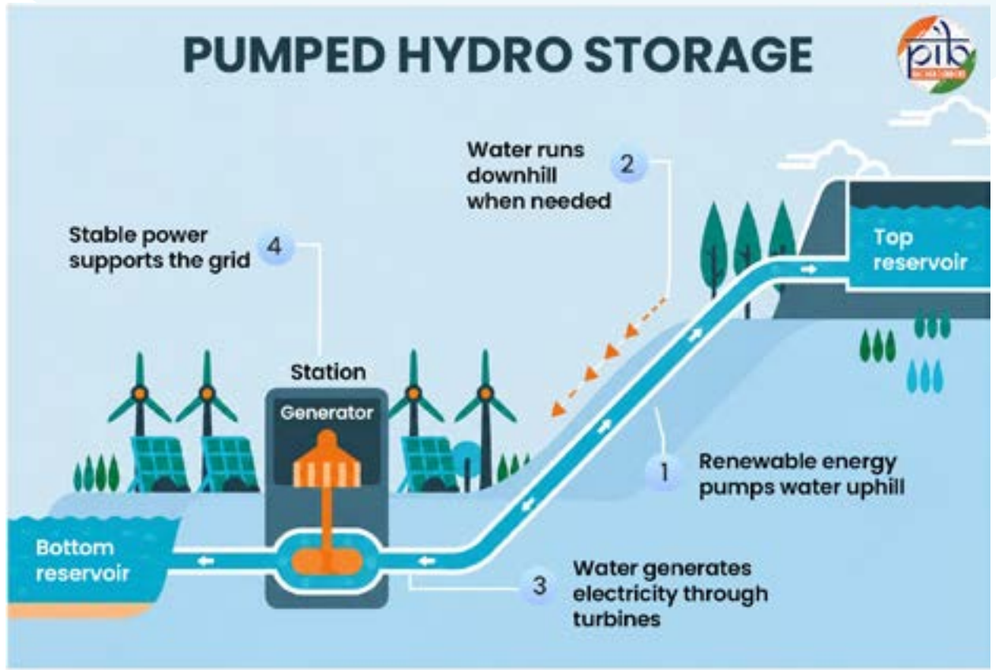
Types of Energy Storage

Battery Energy Storage Systems (BESS) and Pumped Storage Projects (PSPs) offer complementary solutions for integrating renewable energy into the grid. BESS can respond rapidly to short-duration requirements, supporting frequency regulation, peak management and grid balancing. PSPs provide long-duration storage, shifting large quantities of electricity across periods of surplus and demand. BESS can be deployed relatively quickly and close to renewable generation or consumption centres. PSPs require suitable geographical conditions but can provide large-scale storage over extended periods. Their long operating life also supports sustained grid infrastructure needs.

Understanding PSPs: Cycle of Energy Storage and Supply

A Pumped Storage Project typically consists of two reservoirs located at different elevations. During periods of surplus electricity, water is pumped from the lower reservoir to the upper reservoir, where energy is stored as potential energy. When electricity is required, water is released from the upper reservoir through turbines to generate electricity. Once demand subsides, water is pumped back to the upper reservoir during periods of surplus electricity, completing the storage cycle. Pumped Storage Projects therefore function as large-scale energy storage systems and contribute to grid stability and renewable energy integration.





Categorising Pumped Storage Power Plants

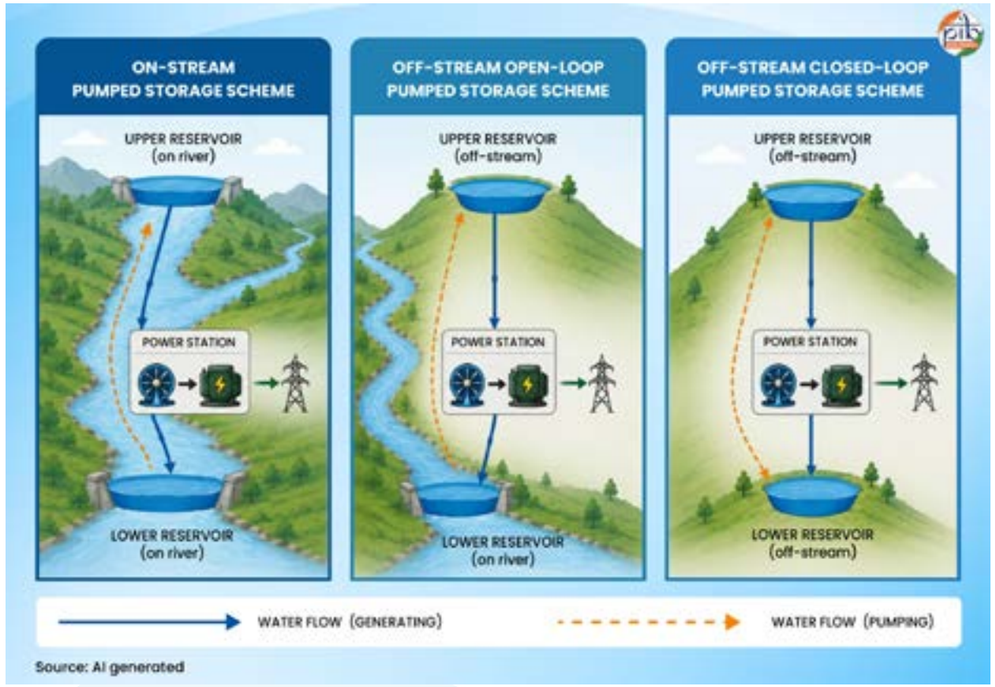
PSPs are classified according to how their reservoirs are connected to, or situated in relation to, natural watercourses. They are grouped into three types: **on-stream, off-stream open-loop and off-stream closed-loop schemes.** These configurations reflect the varying association between a project's reservoirs and natural watercourses.

On-stream Pumped Storage

On-stream pumped storage schemes have **both reservoirs located on a river, stream or nallah**. To meet the electricity demands, water stored in the upper reservoir flows through turbines to generate electricity. During periods of low electricity demand or surplus power, water is pumped back to the upper reservoir for reuse.

Off-stream Open-loop Pumped Storage

Off-stream open-loop pumped storage schemes have **one reservoir located on a river, stream or nallah. In contrast, the other reservoir is not located on a river, a perennial stream, or a perennial nallah.** When electricity is required, water flows from the upper reservoir through turbines to produce electricity. Surplus electricity is subsequently used to pump the water back, restoring the system for another cycle.



Off-stream Closed-loop Pumped Storage

Neither reservoir in an off-stream closed-loop pumped storage scheme is located on a river, perennial stream or perennial nallah. Both reservoirs are situated away from perennial natural watercourses. When electricity is required, water flows from the upper reservoir through turbines that generate power, and is then pumped back to the upper reservoir during periods of low electricity demand or surplus power.

All three types of Pumped Storage Projects have a role based on site-specific geographical and technical conditions. However, efforts are being made to identify more off-stream projects located away from rivers, supporting faster project execution and minimising impacts on aquatic ecology and the surrounding environment.

Scaling Up Energy Storage: India's Pumped Storage Momentum

India is rapidly expanding its pumped storage capacity to support its growing renewable energy base. The development is progressing across operational, construction and pre-construction stages. This expanding pipeline is strengthening India's long-duration energy storage infrastructure.

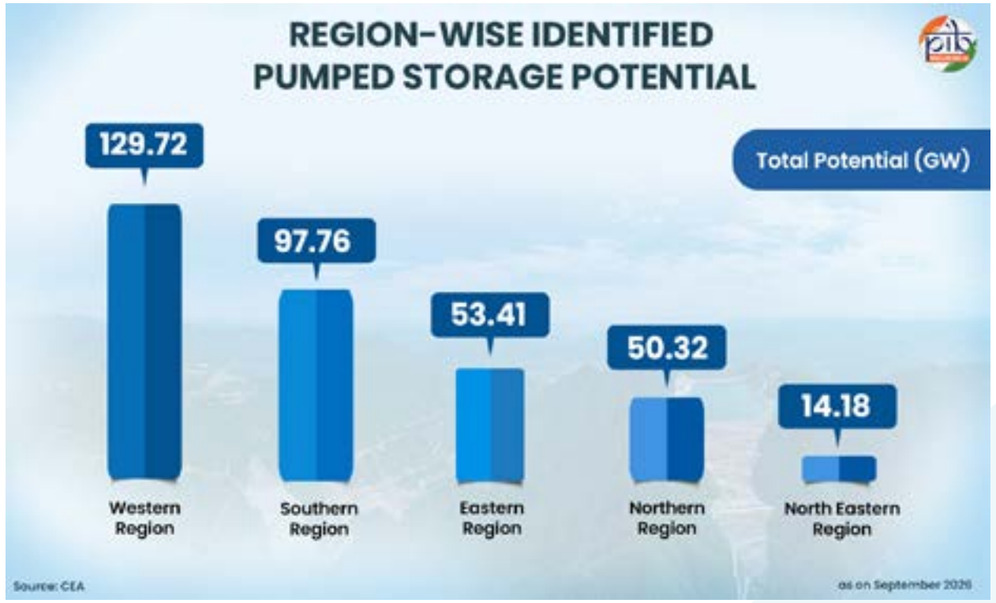
- **Operational Capacity:** As of August 2026, India has 7.43 GW of operational PSP capacity **across 10 projects.** The projects have installed capacity above 25 MW.
- **Under Construction/ implementation Stage:** A further 15.87 GW across 11 PSPs is under construction and/or under implementation across the country.
- **Next Stage of Pipeline:** 10.40 GW across 8 projects has been concurred or appraised by the Central Electricity Authority.

India's Regionally Diverse Pumped Storage Potential

India has identified 320 pumped storage projects with a combined potential of 345.38 GW. This includes 62 on-stream projects with 56.67 GW and 258 off-stream projects with 288.71 GW. These projects span all five regions and include different stages of development, **including projects already in operation.**

PSP development and site suitability require assessment of several technical and environmental aspects. These include topography, geology, hydrology, reservoir characteristics, foundation conditions, seismicity and environmental considerations. Construction materials, power potential and transmission connectivity are also examined during project appraisal. **The Western Region has the highest identified potential at 129.72 GW. CEA attributes this mainly to topographical features and steep gradients of rivers originating from the Western Ghats.** Maharashtra accounts for 67.36 GW, followed by Gujarat with 33.36 GW.

The **Southern Region** has 97.76 GW, led by Andhra Pradesh, Telangana and Tamil Nadu. The **Eastern Region** has 53.41 GW, including 41.53 GW in Odisha. The **Northern Region** has 50.32 GW, led by Uttar Pradesh and Himachal Pradesh. The **North Eastern Region** contributes 14.18 GW to the identified national potential. Collectively, these regional resources underline the scale and spread of India's pumped storage opportunity.



Projected Capacity Addition of Pumped Storage Projects

This extensive resource base provides a strong foundation for scaling long-duration energy storage. The Central Electricity Authority has therefore mapped a substantial capacity addition pathway through 2035–36. **Projects totalling 100.81 GW are envisaged for commissioning by 2035–36.** This includes projects already under construction and would take cumulative PSP capacity to 105.56 GW. The planned expansion can significantly strengthen grid flexibility and enable greater integration of renewable energy. It also positions pumped storage as an important pillar of India's future electricity system.

Year	Addition (GW)	Cumulative (GW)
Up to 2024-25	–	4.745
2025-26	2.68	7.425
2026-27	2.92	10.345
2027-28	1.6	11.945

2028-29	6.35	18.295
2029-30	13.5	31.795
2026-27	21.19	52.985
2031-32	8.8	61.785
2032-33	14.59	76.375
2033-34	11.88	88.255
2034-35	5.7	93.955
2035-36	11.6	**105.555**
Total	**100.81**	



Global Installed Capacity PSPs

Pumped Storage Hydropower Is the world's most widely deployed form of large-scale energy storage, reflecting its established scale and maturity relative to other storage technologies. Global installed pumped hydro capacity stood at **159.8 Gigawatts at the end of 2025,** according to the **International Renewable Energy Agency (IRENA).** China accounted for nearly **66 Gigawatts** of this capacity, followed by Japan and the United States with around **22 Gigawatts and 19 Gigawatts,** respectively. **India ranks fourth globally** in installed pumped storage capacity, with **7.18 Gigawatts at the end of 2025.** The country's capacity has since increased to **7.43 Gigawatts as of July 2026,** reinforcing its growing role in the global pumped storage landscape.

Government Initiatives and Measures

The Government of India has taken a series of coordinated policy, regulatory, demand-side and supply-side measures to promote the development and deployment of PSPs.

- **Dedicated PSP Development Guidelines:** The Ministry of Power notified the Guidelines to Promote Development of Pumped Storage Projects in India in April 2023. The guidelines provide a policy framework for facilitating faster PSP development.
- **Support for Enabling Infrastructure:** Budgetary support covers essential infrastructure required for PSP development. This includes roads, bridges, railway sidings, ropeways, communication facilities and transmission lines. These measures improve project connectivity and strengthen project viability.
- **Competitive Procurement Framework:** Tariff-Based Competitive Bidding (TBCB) Guidelines were notified in February 2025. They provide a transparent and standardised framework for procuring storage capacity and stored energy from PSPs.
- **Inter-State Transmission System Charge Waiver:** PSPs awarded for construction by 30 June 2028 are eligible for a 100% ISTS charge waiver. The waiver applies for 25 years from commercial operation. This measure strengthens the financial viability of PSPs.
- **Faster Project Approvals:** Revised CEA guidelines have reduced Detailed Project Report concurrence timelines. The timeline has been reduced from 90 days to 50 days for all PSPs. The requirement for clearance of Inter-State Aspects has

also been removed. These measures support faster project development.

- **Streamlined Environmental Appraisal:** The Ministry of Environment, Forest and Climate Change has introduced differentiated appraisal provisions for PSPs. Eligible projects can benefit from B2 categorisation under the applicable provisions. Off-stream projects also benefit from reduced baseline data requirements. These measures can accelerate environmental appraisal while maintaining regulatory safeguards.
- **Facilitating Survey and Investigation:** MoEF&CC extended forest land survey provisions and enhanced borehole exploration limits for PSPs, facilitating timely preparation of technically robust Detailed Project Reports.
- **Integrated Grid and Transmission Planning:** National electricity planning integrates energy storage and transmission development. This approach addresses renewable energy variability, reduces congestion and strengthens grid reliability. A roadmap envisages integrating 100 GW of PSP capacity between 2025–26 and 2035–36.
- **Digital Project Monitoring:** The Central Electricity Authority's Jal Vidyut DPR portal enables real-time monitoring of survey and investigation activities. It also facilitates coordination among stakeholders during project preparation. This digital approach helps streamline approvals and accelerate PSP development.
- **Review of limit of capital expenditure requiring the concurrence of the CEA:** Government of India, vide Gazette Notification dated 01.08.2025, has revised the capital expenditure limit for schemes related to setting up hydro generating stations to ₹3,000 crore, requiring the concurrence of the CEA. Further, off-stream closed-loop pumped storage schemes, irrespective of the quantum of capital expenditure have been exempted from the requirement of concurrence by the CEA

These measures spanning policy clarity, fiscal support, streamlined clearances, competitive procurement and integrated grid planning have created an enabling environment for the accelerated development of PSPs.

Energy Transition's Next Imperative

India's target of achieving 500 Gigawatts of non-fossil fuel capacity by 2030 represents a fundamental shift in the country's electricity landscape. As renewable energy assumes a larger role, the ability to store energy and deploy it in line with demand will become increasingly important for maintaining a reliable and balanced power system. Pumped Storage Hydropower is well positioned to address this requirement through its ability to provide large-scale, long-duration energy storage while supporting a range of wider power system needs. Its role extends from managing peak demand and integrating variable renewable energy to strengthening grid flexibility and resilience. As the clean energy ecosystem continues to evolve, the effective deployment of energy storage alongside generation and transmission infrastructure will be central to building a power system that is cleaner, more flexible and prepared for the future.

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06

Pradhan Mantri Viksit Gram Swaraj Yojana

Strengthening Governance at the Grassroots

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Pradhan Mantri Viksit Gram Swaraj Yojana is a **Centrally Sponsored Scheme** approved for 2026-27 to 2030-31, with a total outlay of **₹7,395.55 crore.** It covers **all States and Union Territories,** including eligible traditional rural local government institutions. The scheme seeks to **strengthen Gram Panchayats** as centres of integrated and participatory development planning. Annual targets include **2.55 lakh-plus gram development plans** and **2.55 lakh-plus online audit plans.** Each coordinated awareness intervention will aim to reach **at least one crore citizens.** Digital integration, capacity building and financial accountability are key mechanisms planned for improving grassroots governance.

The Blueprint for Viksit Gram Swaraj

The Union Cabinet, on 28 October, 2026, has approved the Pradhan Mantri Viksit Gram Swaraj Yojana. It is a **Centrally Sponsored Scheme for transforming rural local governance.** The initiative aligns grassroots development with the national vision of Viksit Bharat. It aims to **transform Panchayats** into empowered, self-reliant, accountable and high-performing institutions of local self-government.

The PM Viksit Gram Swaraj Yojana at a Glance	
Implementation Period	2026-27 to 2030-31
Total Financial Outlay	₹7,395.55 crore
Central Government Share	₹7,395.55 crore
State Government Share	₹2,526.07 crore
Direct Beneficiaries	Around 32 lakh elected representatives, Panchayat functionaries and other stakeholders.
Institutional Coverage	Over 2.55 lakh Panchayats and Traditional Local Bodies.
Geographical Coverage	All States and Union Territories, including traditional rural local government institutions in non-Part IX areas where Panchayats do not exist.

Funding the Transformation

PM Viksit Gram Swaraj Yojana has a total outlay of **₹7,395.55 crore.** The Central Government will contribute **₹4,869.48** crore. State Governments will contribute **₹2,526.07 crore.** The scheme period coincides with the **Sixteenth Finance Commission period.** The Commission has recommended approximately **₹4.35 lakh crore in grants** for Rural Local Bodies during 2026-27 to 2030-31. This scheme will help Panchayats use these resources more effectively. It will **connect national priorities, government schemes, available funds, and local aspirations.**

Six Pillars of Grassroots Transformation

PM Viksit Gram Swaraj Yojana focuses on **six holistic pillars** that will strengthen identification of local constraints, improve local planning and governance capabilities, promote digital integration, and ensure transparent resource utilisation at the grassroots level.

- **Gram Panchayats as Hubs of Local Governance:** PM Viksit Gram Swaraj Yojana places Gram Panchayats at the **centre of local development planning.** Panchayats will coordinate village priorities, government interventions, and available resources. This approach will connect national development goals with rural communities' needs and aspirations.

- **Holistic Planning at Gram Panchayat Level:** The scheme will bring Central and State departmental planning processes onto a common digital platform. This will support holistic **Gram Panchayat Development Plans (GPDPs).** The integrated approach will help departments identify gaps, align interventions, and use available resources effectively. Existing departmental arrangements for delivering individual schemes will continue.



- **Digital Governance:** Building on **eGramSwaraj** and existing e-Panchayat systems, PM Viksit Gram Swaraj Yojana will consolidate information on a **common digital platform.** The platform will include government schemes, beneficiaries, benefits, community assets, and available resources. This will help Panchayats identify development gaps and improve planning, coordination, and monitoring. This platform will also help in knowledge sharing among Gram Panchayats of different States.

eGramSwaraj

eGramSwaraj, launched in 2020, is a work-based comprehensive application for Panchayati Raj Institutions (PRIs). It encompasses **all aspects of Panchayat functioning,** i.e., planning, budgeting, accounting, monitoring, asset management etc. **on a single digital platform** including online payments. eGramSwaraj has been **integrated with various government digital platforms,** including the Public Financial Management System (PFMS) for online payments and financial management, Government e-Marketplace (GeM) for procurement, BHASHINI for multilingual AI-enabled services, BSNL for BharatNet connectivity monitoring and the India Meteorological Department (IMD) for weather-related information.

- **Connecting National Priorities with Local Needs:** The scheme will use existing training, digital, and outreach platforms to explain government initiatives in accessible language. Gram Sabhas and Panchayat forums will encourage informed community discussions, thereby, encouraging Jan Bhagidari. **PANCHAM** will support this effort through AI-enabled, multilingual, and two-way communication in **17 Indian languages.** These platforms will help connect national priorities with local needs and village development goals.
- **Capacity Building to put the Approach into Practice:** PM Viksit Gram Swaraj Yojana will strengthen the capabilities of elected representatives and Panchayat functionaries. This will be conducted through Integrated Government Online Training and the National Academy for Capacity Building of Civil Services. Both **specialized** (for example, preparing engineering estimate) and **general training** would be imparted to local representatives. **Capacity building** will support the effective use of digital platforms, interpretation of scheme and resource information,

PANCHAM - Panchayat Assistance and Messaging Chatbot

Launched in January 2026, PANCHAM is a WhatsApp-based tool for direct, timely, and two-way digital interaction with Panchayat Elected Representatives, officials, and citizens. PANCHAM enables easy access to scheme updates, training content, surveys and Panchayat service information, strengthening transparent and effective service delivery at the grassroots.

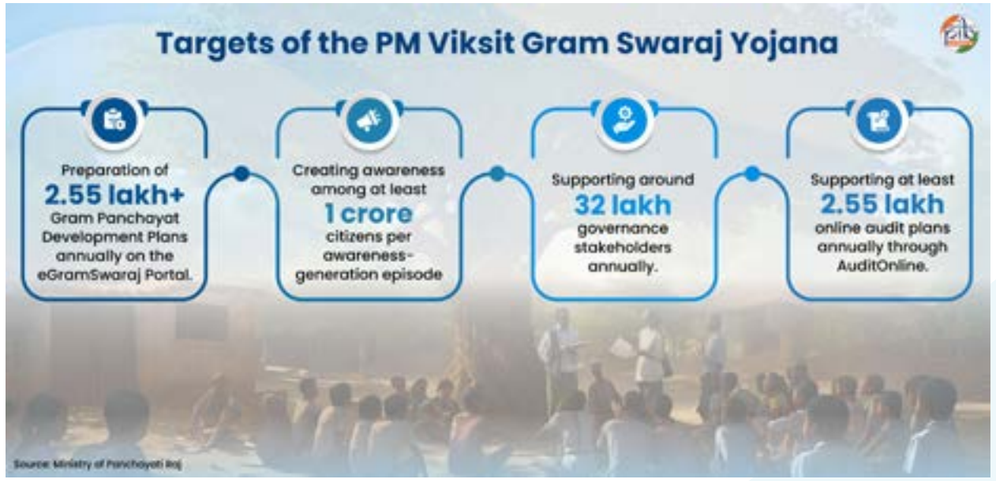
holistic planning, and communication with citizens. These capabilities will help Panchayats translate local discussions into development plans and follow-up action.

- **Transparent and Efficient Utilization of Available Resources:** The scheme will strengthen Panchayats' capacity to utilise Finance Commission grants and other funds effectively. It will also support **Own Source Revenue (OSR)** mobilisation. Online accounting, auditing and public disclosure will improve financial accountability. These measures will promote transparent resource utilisation and support financially self-reliant Panchayats.

GST Return Reforms for Improved Accuracy and Compliance

PM Viksit Gram Swaraj Yojana sets **annual targets** for planning, citizen awareness, capacity building and financial accountability:

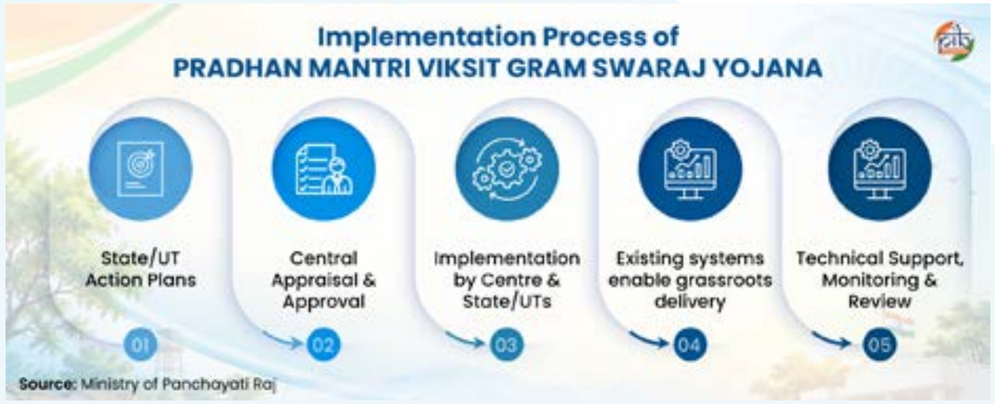
- **The scheme will support the preparation of more than 2.55 lakh GPDPs annually on the eGramSwaraj Portal.** These plans will integrate village priorities, Central and State departmental interventions, and available resources. Coordinated awareness campaigns will improve public understanding of government schemes and national initiatives.
- **At least 1 crore citizens are targeted to be reached per awareness-generation episode.** Digital platforms, outreach activities, Gram Sabhas and Panchayat forums will support citizen engagement. These awareness-generation episodes will aim to improve understanding of relevant Government schemes and national initiatives, encouraging **informed discussion of their local implications.**
- **Around 32 lakh governance stakeholders will be supported annually.** These include elected representatives, Panchayat functionaries and other stakeholders, who will receive capacity building and digital handholding. These interventions will strengthen planning, citizen communication, resource management and progress towards locally relevant **Sustainable Development Goals (SDGs).**
- **The scheme will support at least 2.55 lakh online audit plans annually.** Corresponding audits are expected to be completed on time through **AuditOnline.** Improved accounting and public disclosure will strengthen accountability for available funds.



How the Scheme Will Be Implemented

PM Viksit Gram Swaraj Yojana will operate through existing government institutions and systems. State Governments and Union Territory Administrations will submit **Annual Action Plans.** These will specify activities, priorities and requirements under the scheme. The designated **Central Empowered Committee** will appraise and approve these plans. The process will follow applicable procedures and norms. The Central Government and State/UT administrations will undertake activities within their respective responsibilities. Coordination will support implementation across administrative levels. Technical assistance, monitoring, and review will support implementation. Existing institutional, digital, capacity-building, and communication systems will facilitate grassroots delivery.

The scheme does not provide for the creation of permanent posts. However, it has a provision to engage contractual



AuditOnline

The AuditOnline application was launched in 2020 for carrying out online audits of Panchayati Raj accounts for further strengthening the financial management and transparency of the Panchayats. This application is configurable as per every States' Audit Act/Rules.

personnel based on need at the State, District and Block levels. These personnel will provide technical support and help achieve the scheme's objectives.

Empowering Villages Through Stronger Local Governance

The Pradhan Mantri Viksit Gram Swaraj Yojana seeks to **make rural governance more effective and accountable.** It brings planning, digital systems, community participation, and financial management together. The scheme responds to the need for stronger grassroots institutions as rural development resources and national initiatives expand. It aims to make local governance more coordinated, transparent, and responsive to community priorities. This approach seeks to strengthen grassroots institutions as key drivers of inclusive rural development, contributing to the broader vision of Viksit Bharat.

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07

From AI to EVs: How Technology Is Transforming Urban Swachhata

Published on: 01 October 2026

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On October 2, 2014, the Swachh Bharat Mission began with a simple idea: keep our surroundings clean. Avoid littering public spaces and make cleanliness a shared responsibility. What began with brooms, bins and citizen participation soon became a mass movement. Today, that movement is embracing a new generation of technology. **Urban sanitation is becoming digital, sensor-enabled and electrified**. Digital dashboards are making services easier to track. AI-powered robots are entering spaces too hazardous for workers. Electric vehicles are bringing cleaner mobility to waste collection. From the broom to the bot, technology is giving Swachhata a smarter edge — creating cleaner cities, safer workplaces and more responsive services.

Raipur's Digital Leap: Dashboard Replaces a Queue

Earlier, Raipur residents had to visit the municipal office for septic tank cleaning services. The new digital system lets residents request desludging services online, reducing the need for an in-person visit and cutting wait times.

Raipur Municipal Corporation has introduced a digital **Faecal Sludge Management (FSM)** dashboard prototype based on the **UPYOG (Urban Platform for DeliverY of Online Governance) platform**. Residents can use the system to book desludging services, make payments and track the process digitally. The platform is associated with the Ministry of Housing and Urban Affairs (MoHUA), the National Institute of Urban Affairs (NIUA) and the National Urban Digital Mission (NUDM).

The process is designed to be simple. A resident enters a **mobile number or property ID**, and the system automatically locates the address. A single-page form enables desludging to be booked. But the real change happens behind the screen.



Once a request is placed, the system helps track the service in real time. The "one application, one trip" approach supports better planning. Drivers upload photographs after completing the work, enabling the service to be verified digitally. The dashboard also helps the city monitor vehicles and plan resources more efficiently. For sanitation workers, technology is also changing how hazardous work is approached. Digital monitoring supports the shift from manual sewer cleaning towards mechanised cleaning. This reduces human risk and supports safer work practices.

What looks like a simple dashboard is therefore doing more than replacing paperwork. It connects the citizen, the service provider and the municipal system on one digital platform. In Raipur, the journey from "request" to "service" is becoming a trackable digital process.

G-SPIDER: Inside the Canal, a Robot Takes Over

In the heart of Thiruvananthapuram, the **Amayizhanchan Canal** disappears beneath the **Thampanoor railway** premises. The covered stretch has restricted vertical clearance, continuous water flow and no safe entry points for workers. Conventional cleaning methods therefore become extremely difficult in this confined space.

Thiruvananthapuram Municipal Corporation has brought a robot to clean this difficult space. The city has deployed **G-SPIDER, an AI-powered canal-cleaning system** developed by Technopark-based Genrobotic Innovations, the makers of the robotic scavenger Bandicoot.



The robot uses machine **vision and sensor intelligence** to detect, assess, and remove accumulated waste. It adapts to different waste types, flow conditions and structural challenges in real time. Its **five-degrees-of-freedom mechanism** uses a biomimetic claw to pick up mixed and irregular debris. The extracted waste is then transferred directly into designated collection vehicles.

The significance goes beyond automation. G-SPIDER enhances worker safety by minimising direct exposure to toxic gases, contaminated water and hazardous waste. It can also operate during high water levels and continuous-flow conditions, supporting **scheduled and systematic canal cleaning**.

That makes G-SPIDER more than a cleaning machine. The deployment demonstrates how technology can enable sanitation work in environments where human entry poses significant safety risks. The model also points to wider possibilities. The Thiruvananthapuram deployment showcases a scalable and replicable approach for other high-risk canals and drainage networks.

Garbage Trucks Get an Electric Upgrade

The **daily garbage collection vehicle** is also becoming part of the clean-city transition. Across **Guntur (in Andhra Pradesh)**, **Chennai and Indore cities**, electric vehicles are being integrated into door-to-door waste collection, combining cleaner mobility with smarter waste management.

In Guntur city, more than **200 electric autos** have brought cleaner mobility to door-to-door waste collection across the city. Each **vehicle is equipped with GPS tracking**, allowing real-time monitoring of collection operations. The initiative eliminates the need for more than **71,000 litres** of diesel annually and is estimated to reduce greenhouse gas emissions by **21,000 tonnes** over a decade.

Tamil Nadu's Chennai has brought electric mobility directly into its daily



waste collection system. The Greater Chennai Corporation has deployed **5,478 battery-operated e-rickshaws** across all 15 zones for door-to-door collection. The vehicles travel around 40 km a day, replacing diesel-powered collection vehicles with e-rickshaws and helping reduce pollution. The fleet reduces around 41 tonnes of carbon emissions each day, amounting to an annual reduction of 15,160 tonnes.

But the change is not limited to cleaner vehicles. Each **e-rickshaw has separate**



bins for wet, dry and hazardous waste, bringing segregation into the collection process itself. The fleet now **covers 24,621 streets** and more **than 2.1 million households**, while audio systems on the vehicles carry waste-segregation messages through neighbourhoods. The initiative also supports **employment for more than 6,000 people**.

Indore city in Madhya Pradesh has taken the electric transition a step further by linking waste collection with renewable energy. The city has deployed **100 electric vehicles for door-to-door collection** in core areas. Real-time GPS tracking through the Integrated Command and Control Centre (ICCC) supports monitoring and service transparency. The initiative is expected to **reduce annual carbon emissions** by about **24,918 tonnes** and save around **₹5.97 crore** each year in fuel and maintenance costs.



The city has also established **20 solar charging stations**, each equipped with **10 kW solar panels**. Together, they can **generate 800–1,000 units of green energy** daily and **charge 80–100 vehicles** a day. Across these cities, the garbage collection vehicle is becoming more than a means of transport. It is becoming a cleaner, connected and increasingly efficient part of urban sanitation.

The Next Chapter: Smarter, Safer Swachhata

Technology is giving urban sanitation new tools to clean smarter, work safer and respond faster. From digital dashboards and AI-powered robots to electric waste collection, these innovations are bringing technology closer to everyday Swachhata. The next chapter is about taking these innovations to more cities, adopting them in daily life, making urban sanitation cleaner, safer and more responsive.

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08

Container Manufacturing Promotion Scheme

India’s ₹10,000-Crore Catalyst for Container Manufacturing

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Click here for Hindi

Container Manufacturing Promotion Scheme

Maritime transport is a cornerstone of global trade, with shipping containers playing a vital role in the seamless movement of goods across borders. As of February 2026, India's maritime sector facilitated **95%** of the country's trade by volume and **70%** by value. Beyond its role in trade, the sector contributes **4-5% to India's GDP.**

As India strengthens its position in global manufacturing and international commerce, the demand for containerised cargo movement continues to grow, underscoring the need to build domestic container manufacturing capabilities. To amplify this, the Union Cabinet has approved the C**ontainer Manufacturing Promotion Scheme (CMPS)** with budgetary outlay of **₹10,000 crore up to FY 2039-40.**

Building India's Container Manufacturing Ecosystem

CMPS supports the Government's initiatives under Make in India, Maritime Amrit Kaal Vision 2047 and multimodal logistics development, contributing to India's long-term maritime and trade ambitions-

What are Containers?

Shipping containers are standardized steel freight containers that transport cargo across ships, railways and road vehicles without unloading and repacking the goods during transit. Built as per ISO (International Organization for Standardization) specifications, they enable seamless intermodal transport and efficient global trade. The most common sizes are 20-foot and 40-foot containers, measured in Twenty-foot Equivalent Units (TEUs), the standard unit used to measure container capacity.

DID YOU KNOW?

As per the United Nations Conference on Trade and Development (UNCTAD), ~80% of global merchandise trade by volume is transported by sea.

- It aims to **establish a globally competitive container manufacturing ecosystem** by promoting domestic manufacturing and encouraging investment across the value chain.
- The initiative seeks to **reduce import dependence and strengthen supply-chain resilience.**
- It also **supports new manufacturing facilities and expands existing container manufacturing units.**



Components under CMPS

The scheme provides assistance through major components: **investment support, operational expenditure, and testing and certification.**

Interest Subvention Assistance (ISA)

With a financial outlay of **₹859 crore,** ISA provides a 3% per annum interest subvention on eligible term loans (capital loans) availed by container manufacturers to set up **greenfield facilities and brownfield expansion** of existing manufacturing capacity. To qualify for this support, projects must meet the following criteria:

- Greenfield facilities must have an annual capacity of at least **1,00,000 TEUs;**

Greenfield and Brownfield Facilities

A greenfield project involves building a completely **new asset,** while a brownfield project involves upgrading, renovating, or repurposing an **existing asset.**

- Brownfield expansions must add at least **25,000 TEUs** of annual capacity to be **commissioned within three years** of in-principle approval, and **comply with global container standards.**

Operational Expenditure Assistance (OEA)

Operational Expenditure Assistance (OEA) by Container Type	
Container Type	**Assistance Value (per container)**
20 ft Container	₹49,500
40 ft Container	₹86,625
20 ft Specialised Container	₹37,125 - ₹74,250

To avail support, manufacturers must meet a **minimum local-content requirement of 70%** through FY 2031-32. These criteria will further **rise to 90%** from FY 2032-33 to strengthen the domestic supply chain.

The component provides a financial outlay of **₹8,891 crore** to support containers manufactured as per global shipping standards and sold by eligible manufacturers. The assistance is intended to bridge the cost gap and improve the competitiveness of domestically manufactured containers.

Testing and certification assistance

A financial outlay of **₹150 crore** has been allocated to support the setting up of common facilities such as Dynamic longitudinal impact.





Expected Outcomes and Wider Economic Impact

The scheme aims to expand domestic container production while strengthening India's export potential, supply chains and related industries.

A) Expanded manufacturing capacity: Annual domestic container manufacturing capacity is expected to increase by around ten-fold, up to 7.5 lakh TEUs.

B) Export potential: It will help build a globally competitive container manufacturing base and help India strengthen its potential to position itself as a global export hub for quality shipping containers.

C) Supply-chain resilience: The resilience of India's maritime and logistics supply chains is expected to strengthen.

D) Employment generation: It aims to generate an estimated **3,000 direct jobs** and o**ver 50,000 indirect jobs.**

E) Support for ancillary industries: The Scheme is also expected to benefit industries such as corner castings, specialised steel, wooden frames and paints.



Strengthening India's Maritime Ecosystem

In addition to CMPS, various other measures have been undertaken to build an integrated, domestically anchored logistics ecosystem.

Establishment of the Bharat Container Shipping Line (BCSL)

To build and support an integrated container ecosystem anchored in India, a Memorandum of Understanding (MoU) was signed in February 2026 to establish the **Bharat Container Shipping Line (BCSL).**

The agreement brings together the Shipping Corporation of India (SCI), Container Corporation of India (CONCOR), Jawaharlal Nehru Port Authority (JNPA), V.O. Chidambaranar Port Authority (VOCPA), Chennai Port Authority and Sagarmala Finance Corporation Limited (SMFCL), under the aegis of the Ministry of Ports, Shipping and Waterways.

The MoU will **establish a self-reliant container shipping ecosystem** linking JNPA, VOCPA and Chennai ports with inland markets. It aims to improve end-to-end logistics, stabilise freight costs and strengthen India's trade competitiveness.

Broader Support for the Maritime Sector

Several complementary government initiatives are also strengthening India's maritime sector.

Area of Support	Key Measures and Initiatives
Legislative Support	Merchant Shipping Act, 2025, the Coastal Shipping Act, 2025 and the Indian Ports Act, 2025
Digital Support for Ease of Doing Business	One Nation One Port Process (ONOP), the Maritime Single Window and e-Samudra
Integrated Logistics Network	PM Gati Shakti, The National Logistics Policy (NLP), The Sagarmala Programme

Conclusion

CMPS is set to **strengthen India's maritime manufacturing capabilities,** enhance supply-chain resilience and create employment opportunities, while reducing import dependence. Aligned with broader maritime reforms, the scheme advances India's ambition to **emerge as a globally competitive maritime manufacturing and logistics hub.**

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09

Pradhan Mantri Samajik Sahayata Yojana

Five More Years of Social Assistance, and a Wider Divyangjan Coverage

Published on: 22 October 2026

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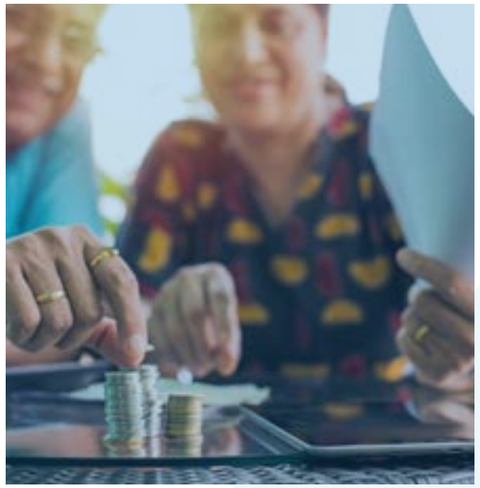
On 14 October 2026, the Union Cabinet approved the continuation of the National Social Assistance Programme for five years, 2026-27 to 2030-31, with an outlay of **Rs 53,428 crore.** The programme becomes the **Pradhan Mantri Samajik Sahayata Yojana,** and its four sub-schemes are renamed with it. While the pension schemes for the old aged, widows and family benefit will continue in their existing forms, the Disability Pension has been revised. It will now use the **40 per cent** benchmark disability of the Rights of Persons with Disabilities Act 2016, in place of **80 per cent.** Its minimum eligibility age of **18 years** is removed, so eligibility now runs from birth. Central assistance rises to **Rs 375 a month for age 0-79 years,** and **Rs 625** at 80 years and above. Further, number of beneficiaries under the disability scheme has increased from **8.33 Lakhs** to **27.48 Lakhs.**

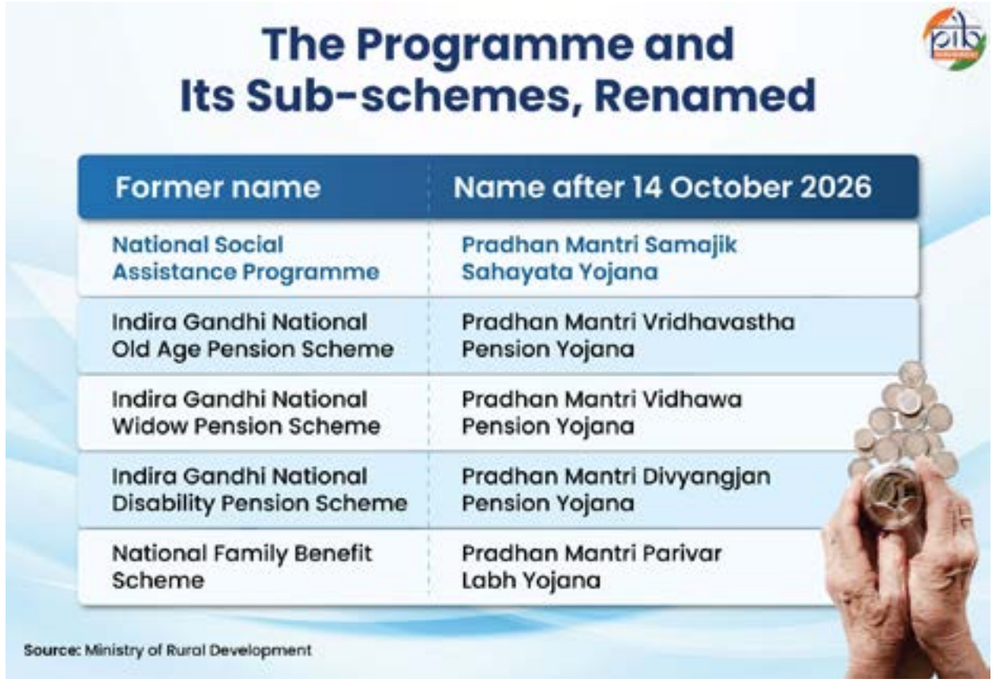
A Renewed Programme for Social Assistance

The Union Cabinet, chaired by the Prime Minister, approved on 14 October 2026 the proposal of the Department of Rural Development to continue the National Social Assistance Programme for five years. The approval runs from 2026-27 to 2030-31 and carries an outlay of **Rs 53,428 crore.**

The approval covers three matters. It renames the programme and each of its sub-schemes. It revises the disability pension. It continues the other sub-schemes in their existing form.

The programme is now the **Pradhan Mantri Samajik Sahayata Yojana.** Its four pension sub-schemes carry new names with it. The old age pension becomes the Pradhan Mantri Vridhavastha Pension Yojana. The widow pension becomes the Pradhan Mantri Vidhawa Pension Yojana. The disability pension becomes the Pradhan Mantri Divyangjan Pension Yojana. The family benefit scheme becomes the Pradhan Mantri Parivar Labh Yojana.





The old age pension, the widow pension and the family benefit scheme continue in their existing form. What changes is the disability pension, in its eligibility, its coverage and its rate of assistance.

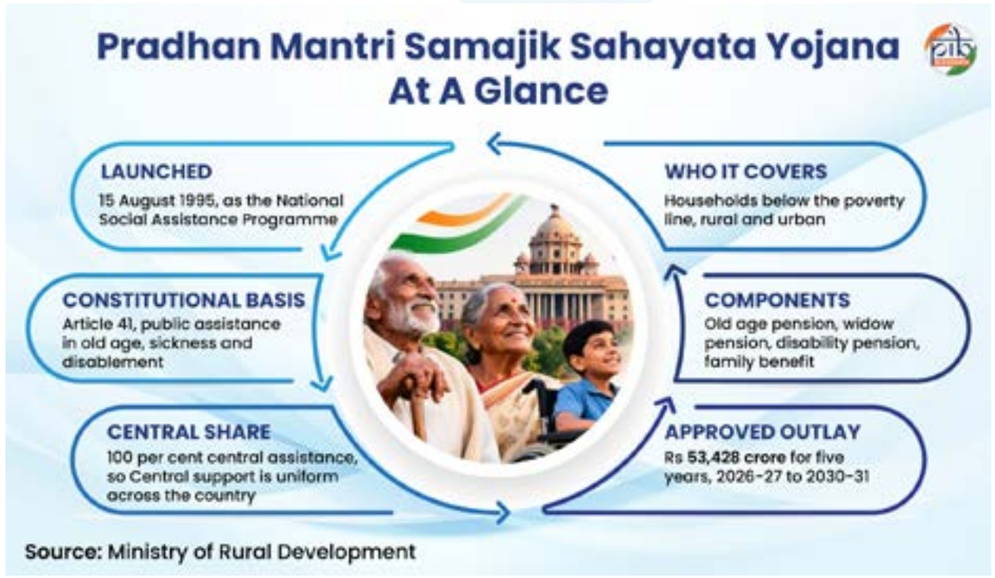
What the National Social Assistance Programme Is

The programme was launched on **15 August 1995.** It gives effect to Article 41 of the Constitution, which directs the State to provide public assistance in cases of unemployment, old age, sickness and disablement. It is a fully funded centrally sponsored scheme and carries **100 per cent central assistance.** This ensures that a person below the poverty line receives at least the minimum support anywhere in the country. It covers both rural and urban areas, and the basic condition across its components is that the household is below the poverty line.

The programme has following components. Three are monthly pensions, for the old aged, for widows and for persons with disabilities. The fourth is a one-time family benefit on the death of a household's primary breadwinner.

States and Union Territories implement the schemes mainly through their social

welfare departments, and in several States through the rural development, women and child development, revenue or labour departments. Gram Panchayats and municipalities take an active part in identifying beneficiaries, and payment is largely by direct benefit transfer.

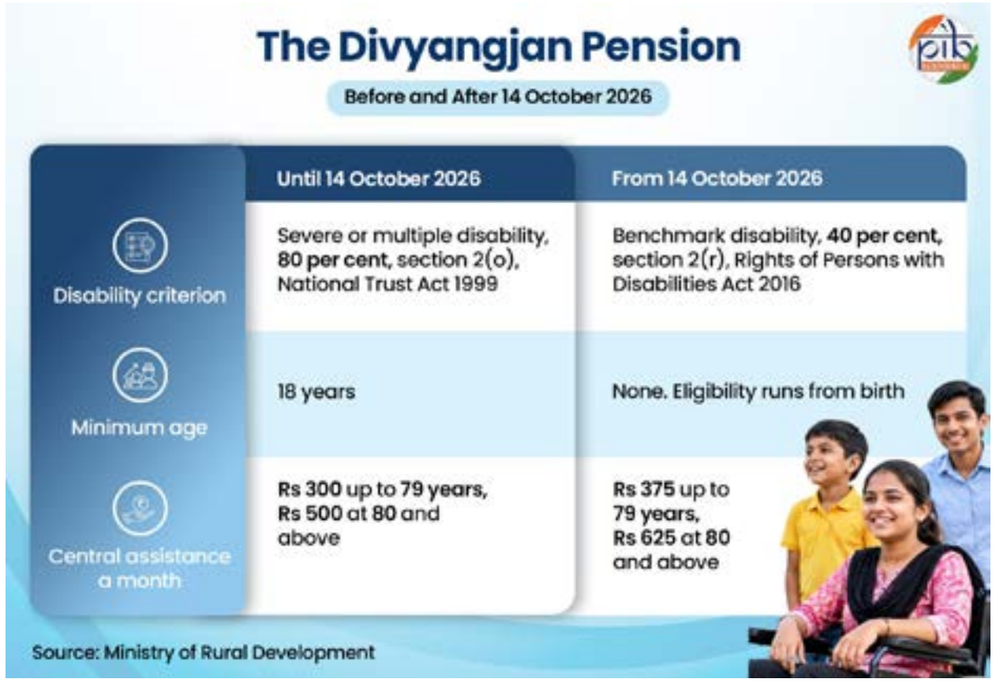


The States and Union Territories also add their own top-up above the central rate. As on September 2026, those top-ups ranged from **Rs 50 to Rs 5700 per month** per beneficiary, giving an average monthly pension of around Rs 1100 in most States and Union Territories. The central rate is therefore the floor on which each State builds.

The programme covered about **3.09 crore beneficiaries,** against scheme-wise ceilings for each State and Union Territory. It was allocated Rs 9,652 crore for 2025-26, of which the disability pension accounted for Rs 290 crore. The approval of 14 October 2026 puts the programme's coverage at **3.20 crore beneficiaries** across all 36 States and Union Territories.

The Divyangjan Pension in Detail

The disability pension was introduced in February 2009, as the Indira Gandhi National Disability Pension Scheme. Section 2(o) of the National Trust Act 1999 defines severe disability as disability with **80 per cent** or more of one or more multiple disabilities. A person therefore had to be assessed at 80 per cent or above, and to be at least 18 years old, to receive the pension. Central assistance was Rs 300 a month for beneficiaries upto the age of 79, and Rs 500 a month for beneficiaries at age 80 and above.



Parliament then enacted the Rights of Persons with Disabilities Act 2016, to give effect to the United Nations Convention on the Rights of Persons with Disabilities. That Act sets a single working measure across its own entitlements. Section 2(r) defines a person with benchmark disability as a person with not less than **40 per cent** of a specified disability, as certified by the certifying authority.

The 2016 Act has necessitated changes in the eligibility criteria for the disability pension, linking it to benchmark disability of 40 per cent.

By its decision of 14 October 2026, the Government has brought the pension, now the **Pradhan Mantri Divyangjan Pension Yojana,** onto that benchmark. It has removed the minimum age requirement, so that eligibility runs from birth. It has also raised central assistance to **Rs 375 a month** up to 79 years and **Rs 625 a month** at 80 years and above. The number of beneficiaries under this sub-scheme scheme has increased from **8.33 Lakhs** to **27.48 Lakhs.**

Revised guidelines carrying the eligibility

criteria, the number of beneficiaries and the rates of assistance will be issued and implemented within three months.

Who the Decision Will Benefit

Three groups gain from the decision, and they are worth keeping distinct.

- **Persons certified between 40 and 79 per cent,** in households below the poverty line. The benchmark disability criterion approved on 14 October 2026 brings them within the pension.
- **Children, from birth.** A child with a certificate of benchmark disability in a household below the poverty line will benefit under the approved criteria, where the family earlier waited until the child turned 18.
- **Persons already receiving the pension.** They will receive the enhanced rates of Rs 375 and Rs 625 approved by the Government.



Three conditions are unchanged for all of them. A certificate of disability is still required, since benchmark disability under the 2016 Act is a percentage certified by the certifying authority. The household must still be below the poverty line, and the application route remains the State welfare department.

A Common Measure Across the Welfare System

Census 2011 recorded **2.68 crore** persons with disabilities in India, 2.21 per cent of the population. The Schedule to the 2016 Act specifies **21 types** of disabilites.

Since the 2016 Act came into force on 19 April 2017, its 40 per cent benchmark has governed disability entitlements in higher education, government employment, and land and housing. By the decision of 14 October 2026, the Government has brought its oldest social assistance programme, i.e., disability pension, in alignment with the Rights of Persons with Disabilities Act 2016.

The revised guidelines will complete the picture, carrying the eligibility criteria, the number of beneficiaries and the rates of assistance under the Pradhan Mantri Divyangjan Pension Yojana in one official document.

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10

Ramsar Sites in India

Safeguarding Wetlands of International Importance

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India's network of Wetlands of International Importance under the Ramsar Convention has expanded nearly fourfold since 2014. It has grown from 26 to 103 designated sites covering over 13.87 lakh hectares. Ranking first in Asia and third globally, these ecosystems safeguard biodiversity, buffer floods, recharge groundwater, and sustain livelihoods. Anchored by the Wetlands (Conservation and Management) Rules, 2017, the Government of India drives scientific and participatory conservation through the National Plan for Conservation of Aquatic Ecosystems (NPCA), Amrit Dharohar, MISHTI, and Mission Sahbhagita to secure long-term ecological resilience.

Ramsar Sites in India — At a Glance

As per the Ramsar Convention, "Wetlands are the areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres". Linking land and water, wetlands store fresh water, recharge groundwater, buffer floods and sustain fisheries and farming. They also shelter migratory birds and rich biodiversity, placing them among the most productive ecosystems on Earth.

Globally, these habitats are protected under the **Convention on Wetlands** or the **Ramsar Convention**, an intergovernmental treaty. It was adopted at Ramsar, Iran, on **2 February 1971** and entered into force in 1975. As on October 2026, it now includes **172** Contracting Parties and over **2,536** designated **"Ramsar Sites"** worldwide.

India, home to a large number of wetlands, became a Party to the Convention on **1 February 1982**. It has steadily expanded its network since then. The country now has **103 Ramsar Sites**, a nearly fourfold rise from just 26 sites in 2014. India's network ranks **first in Asia** and **third in the world** in terms of number of sites. Collectively, these sites cover more than **13.87 lakh hectares** across 28 States and Union Territories.





Understanding Ramsar Sites

A Ramsar Site is a wetland designated as a Wetland of International Importance under the Ramsar Convention. These sites are recognised for their ecological, botanical, zoological, limnological or hydrological significance. The Ramsar Convention rests on three pillars. These are the wise use of all wetlands, the designation and effective management of Ramsar Sites, and international cooperation on wetland conservation.

How a Wetland is Designated

In India, the process begins with the State Government or Union Territory Administration identifying a suitable wetland. The Ministry of Environment, Forest and Climate Change then coordinates approval and forwards the proposal to the Ramsar Secretariat.



Criteria for Designation

A wetland must meet at least one of nine criteria to qualify as a Wetland of International Importance. The criteria fall into two groups, covering wetland types and the conservation of biological diversity.

Group	Criteria	A wetland should be considered internationally important
Group A: Wetland types		
	Criterion 1	If it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
Group B: Biological diversity		
Criteria based on species and ecological communities	**Criterion 2**	If it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
	Criterion 3	If it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
	Criterion 4	If it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
Specific criteria based on waterbirds	**Criterion 5**	If it regularly supports 20,000 or more waterbirds.
	Criterion 6	If it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.
Specific criteria based on fish	**Criterion 7**	If it supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/ or values and thereby contributes to global biological diversity.
	Criterion 8	If it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.
Specific criteria based on other taxa	**Criterion 9**	If it regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

Did You Know?

A taxon is a group of organisms classified together based on shared characteristics, while taxa is the plural form, referring to multiple groups. For example, flowering plants, such as roses, form a plant taxon, while butterflies belong to an insect taxon. Major taxa in biodiversity include amphibians, reptiles and mammals.

Benefits of Designating Wetlands to Ramsar List

Designating wetlands to the Ramsar list and meeting Ramsar Convention commitments is a contribution to global efforts for biodiversity conservation. Ramsar Sites are recognized as being of significant value not only for a country but for humanity as a whole. Designating Ramsar Sites and ensuring their conservation and wise use:

- **Provides a platform for international representation:** Enables countries to voice their concerns at the principal intergovernmental forum on wetland conservation and wise use. At the Ramsar 15th Conference of Parties held at Victoria Falls, Zimbabwe, India introduced a Resolution on **'Promoting Sustainable Lifestyles for the Wise Use of Wetlands'**. The resolution was adopted at the Conference. The resolution received overwhelming support from the 172 Ramsar Contracting Parties, Six International Organisation Partners, and other observers.
- **Enhances visibility and recognition:** Increases the international visibility and recognition of Ramsar Sites. This can strengthen support for their conservation and wise use.
- **Provides access to international standards and guidance:** Offers access to the latest information on internationally accepted standards for identifying wetlands of international importance. It also provides guidance on wise use and wetland management planning.
- **Facilitates expert assistance:** Enables access to expert advice on national and site-specific wetland conservation and management challenges. Support is available through the Ramsar Secretariat, its collaborators, and Ramsar Advisory Missions, where appropriate.
- **Promotes international cooperation and financial support:** Encourages cooperation on wetland conservation and management. It can also facilitate project support through the Convention's small-grant programmes and links with multilateral and bilateral funding agencies.

Commitments After Designation

Designation commits the State or Union Territory to the wise use of the wetland and its resources. The site is deemed notified under the Wetlands (Conservation and Management) Rules, 2017, and also the guidelines recommend to be formally notified under these rules with an Integrated Management Plan. The Ramsar Information Sheet must be updated every six years, and the site's ecological character monitored regularly. Guided by these criteria and commitments, India has built a large and remarkably diverse network of Ramsar Sites.

India's Ramsar Sites — From 26 to 103



India's Ramsar Sites span high-altitude lakes, river floodplains, mangroves, coral reefs, village tanks and urban marshes. **Tamil Nadu** has the highest number with **20 sites**, followed by **Uttar Pradesh** with **14 sites**. Growth has been rapid, and in 2025 alone, 11 wetlands were added, taking the national total to 96. Surha Tal in Uttar Pradesh became the **100th site** in June 2026, and Glaw Lake the **101st** in August. India's Ramsar site tally has reached **103** on October 15, 2026, with the designation of **Sukhna Wetland** in **Chandigarh** and **Sauj Jheel** in **Uttar Pradesh** as the latest additions to the list.

Did You Know?

The First Ramsar Sites

Chilika Lake in Odisha and **Keoladeo National Park** in Rajasthan became India's first Ramsar Sites on 1 October 1981. After successful ecological restoration, Chilika was removed from the Montreux Record in 2002. Chilika Development Authority later won the Ramsar Wetland Conservation Award.

What is Montreux Record: It is a register of Ramsar Sites where changes in ecological character have occurred, are occurring or are likely to occur. It



identifies wetlands requiring priority conservation attention and guides monitoring, remedial action and resource allocation. Sites are included in consultation with the concerned country and relevant scientific experts. Sites may be removed from the record once successful remedial measures are documented or when the threat of ecological change no longer exists.

India's latest additions to Ramsar Sites

Sukhna Wetland (Chandigarh) is a human-made reservoir created in 1958 at the foothills of the Shivalik hills. It shelters threatened species such as Pallas's fish eagle, the common pochard and the black pond turtle. Migratory birds on the Central Asian Flyway rely on it for feeding and wintering.





Sauj Jheel (UP) is a shallow floodplain lake in Mainpuri district that regularly hosts more than 30,000 waterbirds. It provides nesting and foraging grounds for threatened birds such as the sarus crane and the greater spotted eagle. Its sacred lotus and wild sugarcane beds offer cover for nesting birds, fish and amphibians.

State-wise List of Ramsar Sites

The table below lists all 103 Ramsar Sites by State and Union Territory, with their key conservation value.

	State/UT	Ramsar Site	What is special about it
1	**Andhra Pradesh**	Kolleru Lake	Freshwater lake; grey pelican and migratory waterbirds
2	**Arunachal Pradesh**	Glaw Lake	Eastern Himalayan Lake; 150+ tree and 49 orchid species
3	**Assam**	Deepor Beel	Brahmaputra floodplain wetland; migratory waterbirds
4	**Bihar**	Kanwar Jheel (Kabartal)	Floodplain wetland; migratory waterbirds and fish
5		Nagi Bird Sanctuary	Human-made reservoir; wintering waterbirds
6		Nakti Bird Sanctuary	Human-made reservoir; wintering waterbirds
7		Gokul Jalashay	Ganga oxbow lake; birds, fisheries and flood buffering
8		Udaipur Jheel	Oxbow lake; wintering migratory birds
9		Gogabil Lake	Oxbow lake; resident and migratory birds
10	**Chandigarh**	Sukhna Wetland	Rain-fed, peri-urban reservoir; migratory and resident birds
11	**Chhattisgarh**	Kopra Jalashay	Reservoir; resident and migratory waterbirds

12	**Goa**	Nanda Lake	Freshwater marsh; wintering waterbirds
13	**Gujarat**	Nalsarovar	Natural freshwater lake; sarus crane and waterbirds
14		Wadhvana Wetland	Irrigation reservoir; wintering migratory birds
15		Thol Lake Wildlife Sanctuary	Human-made reservoir; waterbirds including sarus crane
16		Khijadia Wildlife Sanctuary	Coastal freshwater and salt marsh wetland near Gulf of Kutch; diverse birds
17		Chhari Dhand	Seasonal desert wetland near Banni; cranes and flamingos
18	**Haryana**	Sultanpur National Park	Resident and migratory waterbirds
19		Bhindawas Wildlife Sanctuary	Human-made freshwater wetland; migratory birds
20	**Himachal Pradesh**	Pong Dam Lake	Beas reservoir; wintering waterbirds
21		Chandertal Wetland	High-altitude lake; snow leopard habitat
22		Renuka Wetland	Spring-fed lake; aquatic and forest biodiversity
23	**Jharkhand**	Udhwa Lake Bird Sanctuary	Twin Ganga-linked lakes; migratory and resident waterbirds

24	**Karnataka**	Ranganathittu Bird Sanctuary	Kaveri islets; nesting waterbirds and mugger crocodile
25		Aghanashini Estuary	Estuary and mangroves; fisheries
26		Magadi Kere Conservation Reserve	Human-made tank; wintering bar-headed goose
27		Ankasamudra Bird Conservation Reserve	Village irrigation tank; nesting waterbirds
28	**Kerala**	Ashtamudi Wetland	Estuarine backwaters; fisheries and mangroves
29		Sasthamkotta Lake	Spring-fed freshwater lake; drinking water source
30		Vembanad-Kol Wetland	Largest brackish wetland on the southwest coast
31	**Madhya Pradesh**	Bhoj Wetlands	Upper and Lower Lakes of Bhopal; water supply and birds
32		Sirpur Wetland	Human-made wetland in Indore; migratory birds
33		Sakhya Sagar	Reservoir in Madhav National Park; mugger crocodile
34		Yashwant Sagar	Reservoir near Indore; sarus crane and water supply
35		Tawa Reservoir	Reservoir in Satpura Tiger Reserve; aquatic and bird life

36	**Maharashtra**	Nandur Madhameshwar	Bird sanctuary; migratory waterbirds
37		Lonar Lake	Meteorite impact crater lake; saline-alkaline ecosystem
38		Thane Creek	Mangroves; flamingos and migratory birds
39	**Manipur**	Loktak Lake	Floating phumdis; habitat of the Sangai deer
40	**Mizoram**	Pala Wetland	Largest natural wetland of Mizoram; hoolock gibbon
41	**Odisha**	Chilika Lake	Brackish lagoon; Irrawaddy dolphin, waterbirds and 118 fish species
42		Bhitarkanika Mangroves	Mangroves; saltwater crocodile and olive ridley turtle
43		Satkosia Gorge	Mahanadi river gorge; gharial and mugger crocodile
44		Tampara Lake	Freshwater lake; fish and waterbirds
45		Hirakud Reservoir	Large reservoir; fish and waterbirds
46		Ansupa Lake	Mahanadi oxbow lake; birds and fish
47	**Punjab**	Harike Lake	River confluence reservoir; migratory waterbirds
48		Kanjli Lake	Barrage-formed wetland on Kali Bein; waterbirds

49	**Punjab**	Ropar Lake	Sutlej barrage reservoir; waterbirds
50		Beas Conservation Reserve	River stretch; Indus River dolphin and gharial
51		Keshopur-Miani Community Reserve	Community-managed wetland; waterbirds
52		Nangal Wildlife Sanctuary	Shivalik foothill reservoir; waterbirds
53	**Rajasthan**	Keoladeo National Park	Waterbirds; historic wintering ground of Siberian crane
54		Sambhar Lake	Large inland saline lake; flamingos
55		Menar Wetland Complex	Community-protected village wetlands; migratory birds
56		Khichan Wetland	Wintering demoiselle cranes; community conservation
57		Siliserh Lake	Reservoir near Alwar; wetland biodiversity
58	**Sikkim**	Khecheopalri Wetland	Sacred Himalayan Lake with peatland and forest
59	**Tamil Nadu**	Point Calimere Wildlife and Bird Sanctuary	Coastal wetland; flamingos and migratory shorebirds
60		Koonthankulam Bird Sanctuary	Largest waterbird breeding reserve in South India
61		Chitrangudi Bird Sanctuary	Breeding and wintering ground for waterbirds

62		Karikili Bird Sanctuary	Breeding waterbirds
63		Pichavaram Mangrove	One of India's largest mangroves; fish nursery
64		Pallikaranai Marsh Reserve Forest	Urban marsh; flood buffer and birds
65		Gulf of Mannar Marine Biosphere Reserve	Coral reefs and dugong
66		Vembannur Wetland Complex	Human-made irrigation tank; waterbirds
67		Vellode Bird Sanctuary	Waterbirds
68		Udhayamarthandapuram Bird Sanctuary	Migratory waterbirds
69	**Tamil Nadu**	Vedanthangal Bird Sanctuary	One of India's oldest bird-protected areas; heronry
70		Suchindram Theroor Wetland Complex	Irrigation tanks; migratory birds
71		Vaduvur Bird Sanctuary	Wintering waterbirds
72		Kanjirankulam Bird Sanctuary	Nesting herons and painted storks
73		Karaivetti Bird Sanctuary	Large inland freshwater lake; nesting waterbirds
74		Longwood Shola Reserve Forest	Nilgiris shola forest; endemic birds
75		Kazhuveli Bird Sanctuary	Brackish coastal lake; migratory birds
76		Nanjarayan Bird Sanctuary	Lake; resident and migratory birds

77	**Tamil Nadu**	Sakkarakottai Bird Sanctuary	Migratory waterbirds
78		Therthangal Bird Sanctuary	Nesting waterbirds
79	**Tripura**	Rudrasagar Lake	Reservoir lake; fish and three-striped roof turtle
80		Upper Ganga River (Brijghat to Narora)	Gangetic dolphin, gharial and turtles
81		Nawabganj Bird Sanctuary	Migratory waterbirds
82		Sarsai Nawar Jheel	Sarus crane habitat
83		Sandi Bird Sanctuary	Freshwater marsh; waterfowl and sarus crane
84		Samaspur Bird Sanctuary	Waterbirds
85	**Uttar Pradesh**	Parvati Arga Bird Sanctuary	Twin oxbow lakes; waterbirds and vultures
86		Saman Bird Sanctuary	Oxbow lake; wintering waterbirds
87		Sur Sarovar	Human-made reservoir near Agra; waterbirds
88		Haiderpur Wetland	Ganga floodplain; gharial, swamp deer and waterbirds
89		Bakhira Wildlife Sanctuary	Largest natural floodplain wetland of eastern UP
90		Patna Bird Sanctuary	Waterbirds

91	**Uttar Pradesh**	Shekha Jheel Bird Sanctuary	Wintering bar-headed geese and painted storks
92		Jai Prakash Narayan Bird Sanctuary (Surha Tal)	Rich avifauna; migratory and resident birds
93		Sauj Jheel	Shallow, perennial floodplain wetland; migratory and resident waterbirds
94	**Uttarakhand**	Asan Conservation Reserve	Asan-Yamuna confluence; migratory waterbirds
95	**West Bengal**	East Kolkata Wetlands	Wastewater-fed fisheries and agriculture
96		Sundarban Wetland	Mangroves; Royal Bengal tiger
97	**Jammu and Kashmir (UT)**	Wular Lake	Large freshwater lake; fisheries
98		Surinsar-Mansar Lakes	Twin freshwater lakes
99		Hokera Wetland	Reedbeds; white-eyed pochard
100		Hygam Wetland Conservation Reserve	Flood absorption basin; waterbirds
101		Shallbugh Wetland Conservation Reserve	Waterbirds
102	**Ladakh (UT)**	Tsomoriri	High-altitude lake; black-necked crane and bar-headed goose
103		Tso Kar Wetland Complex	High-altitude lakes; black-necked crane breeding

Did You Know?

The Largest Ramsar Site

Sundarban Wetland in West Bengal, designated on 30 January 2019, is India's largest Ramsar Site at **4,23,000 hectares**. It holds over 60 per cent of India's mangrove area and a tiger population with unique aquatic hunting skills.



How Ramsar Sites Aid in Conservation

Ramsar status brings global recognition, scientific guidance and access to expert advice for designated wetlands. It also places clear duties on States to protect each site's ecological character through planning and monitoring.

- **Restoring Ecosystems:** Chilika Lake shows how sustained restoration can revive a wetland and the communities that depend on it. Today, the lagoon supports 118 fish species and serves as a breeding, wintering and staging ground for waterbirds.
- **Sustaining Livelihoods:** The East Kolkata Wetlands treat the city's wastewater naturally through about 4,000 hectares of fish ponds. They yield about 10,500 tonnes of fish a year and directly support about 50,000 people.
- **Building Climate Resilience:** The Sundarban mangroves shield inland areas from storms, cyclones, tidal surges and saltwater intrusion. They also serve as nurseries for fish and shellfish, sustaining fisheries along India's entire eastern coast.
- **Reviving Threatened Species:** The Beas Conservation Reserve in Punjab holds India's only known population of the endangered Indus River dolphin. A reintroduction programme launched in 2017 released 47 gharials, nearly three decades after they vanished from the river. The 185-kilometre river stretch also supports more than 500 bird species and over 90 fish species.

- **Community Stewardship:** Khichan Wetland in Rajasthan hosts more than 22,000 wintering demoiselle cranes each year on just 54 hectares. Residents of the adjoining village actively protect the birds from power line collisions and stray dog attacks.

Government Initiatives for Wetland Conservation

India's Ramsar network is backed by a strong framework of laws, schemes and people's participation.

Wetlands (Conservation and Management) Rules, 2017

Notified under the Environment (Protection) Act, 1986, these Rules provide the regulatory framework for wetland conservation. They establish State/UT Wetlands Authorities and prohibit activities such as encroachment, waste dumping and untreated effluent discharge.

National Plan for Conservation of Aquatic Ecosystems (NPCA)

NPCA merged the national programmes for lake and wetland conservation into one scheme. Updated NPCA Guidelines issued in 2024 give States an integrated and scientific framework for managing wetlands.

Amrit Dharohar

Amrit Dharohar promotes the unique conservation values of India's Ramsar Sites. It covers species and habitat conservation, nature tourism, wetland livelihoods and wetland carbon assessment. Under this, studies for the inventory of flora and fauna of 75 Ramsar Sites have been conducted by the Botanical Survey of India and the Zoological Survey of India, respectively. A 'Standard Operating Procedure for Assessment of Carbon Stock in Wetlands' was released, and has been utilised to assess the Carbon stock of 39 Ramsar Sites across the country.

Mission Sahbhagita and the Save Wetlands Campaign

Mission Sahbhagita promotes participatory conservation; its Save Wetlands Campaign began in Goa on 4 February 2023. Over 2 million citizen volunteers have since helped map more than 1.7 lakh wetlands across the country.

Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)

MISHTI targets mangrove restoration over 540 square kilometres in nine States and four UTs. So far, ₹88.44 crore has been released to restore 9,949.5 hectares of degraded mangroves.

Wetlands of India Portal

Inaugurated on 2 October 2021, the portal serves as a dynamic knowledge repository on India's wetlands. It offers single-point access to information on sites, projects, initiatives and training for managers and citizens.

Wetland City Accreditation

Indore and Udaipur became India's first Ramsar-accredited Wetland Cities in January 2025, joining the global network of Ramsar-accredited Wetland Cities.

Way Forward

India's expanding Ramsar network offers an opportunity to strengthen wetland conservation through science, effective management and community participation. The focus ahead must be on translating international recognition into lasting ecological outcomes. Regular monitoring, evidence-based planning and coordination among governments, institutions and local communities can help maintain the ecological character of these wetlands. Sustained efforts will be essential to ensure that wetlands continue to support biodiversity, water security, climate resilience and livelihoods for future generations.

Equally important is the need to integrate wetland conservation into wider development planning. Strengthening local stewardship, improving data and knowledge sharing, and promoting sustainable livelihood opportunities can deepen conservation efforts. By combining ecological priorities with the needs of communities, India can build a more inclusive and resilient approach to wetland management, ensuring these ecosystems remain productive and protected over the long term.

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11

Minimum Support Price for Rabi: Marketing Season 2027-28

Strengthening Price Assurance, Procurement and Farmer Access

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Minimum Support Price (MSP) serves as an important mechanism for providing price assurance to farmers and supporting informed decisions on agricultural planning and investment. On 30 September 2026, the Government approved increased MSPs for all mandated Rabi crops for the **Rabi Marketing Season (RMS) 2027-28**, with an estimated **₹90,962 crore** to be paid to farmers for 324 lakh metric tonnes (MT) of produce. The expanding scale of MSP support is reflected in procurement trends and payments over the years. Procurement of six Rabi crops increased from 2,302 lakh metric tonnes (LMT) during 2004-05 to 2013-14 to 3,921 LMT during 2014-15 to 2025-26. Correspondingly, **MSP payments** rose from ₹2.65 lakh crore to **₹8.36 lakh crore**. Meanwhile, digital platforms are enhancing the accessibility and transparency of procurement and payment processes. Together, price assurance, expanded procurement and technology-enabled delivery are strengthening farmers' access to markets and supporting greater confidence in agricultural decisions.

Minimum Support Price: Supporting Farmers Through Price Stability

A farmer's economic returns are shaped not only by agricultural production but also by the prices received for the harvested produce. After investing months of labour, resources, and inputs in cultivation, the market price ultimately influences farm earnings and the capacity to sustain agricultural operations. For small and marginal farmers, adverse fluctuations in market prices can introduce considerable uncertainty into farm income and affect decisions regarding future cultivation.

In this context, the Minimum Support Price (MSP) serves as an important policy instrument for supporting farmers. It provides a price assurance mechanism through which the government undertakes procurement of eligible agricultural produce at predetermined prices. MSP ensures remunerative returns to farmers while encouraging agricultural investment and production.

By providing a measure of price assurance, MSP can help mitigate farmers' exposure to adverse market fluctuations. When market prices are low, procurement at MSP provides an avenue to sell eligible produce at the announced price. This mechanism helps reduce price uncertainty, support farm income stability, and facilitate planning for subsequent agricultural seasons. By strengthening confidence in expected returns, MSP also contributes to farmers' decisions regarding investment in improved seeds, agricultural technology, and other productivity-enhancing inputs.

When Better Farming Meets Assured Returns

The experience of **Shri K. Chikkana, a 72-year-old millet farmer** from Bombrahalli village, Karnataka, illustrates how improved agricultural practices, institutional support, and price assurance can contribute to enhanced farm productivity and income.

For several years, Shri Chikkana cultivated **traditional finger millet varieties** using **conventional farming methods**. Under irrigated conditions, the **productivity** remained at **around 9-11 quintals per acre**.

A significant change came during the Rabi Season of 2025, when he adopted the **improved HR-13 finger millet variety**. ICAR-IIMR (Indian Council of Agricultural Research-Indian Institute of Millets Research) supplied the variety through Kusumagiri Farmers Producer Organization, Kundrupi.



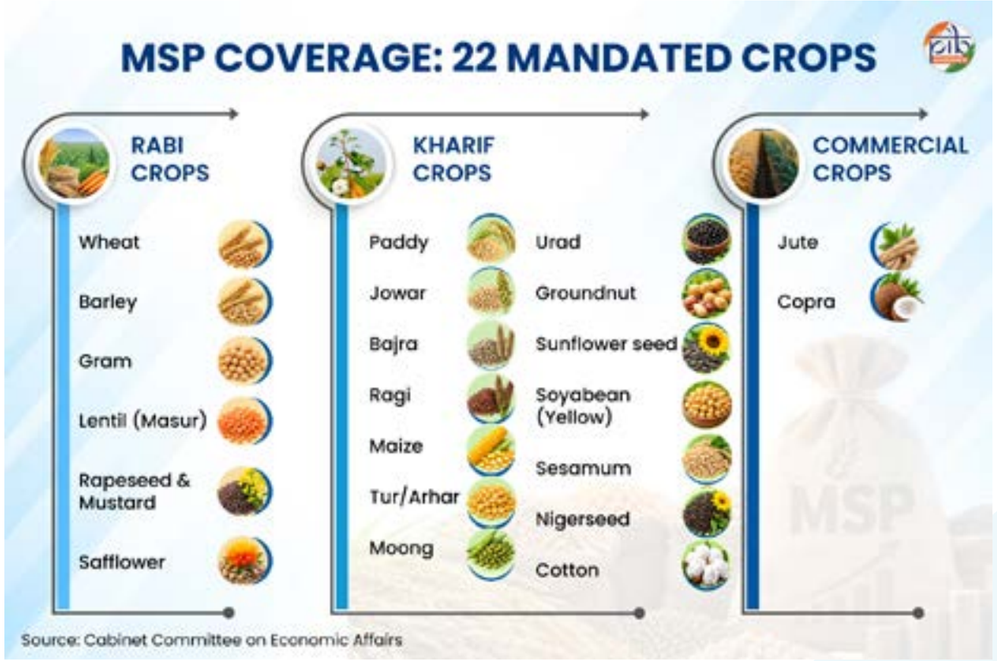
With technical guidance from ICAR-IIMR scientists, he also incorporated improved cultivation practices, including transplanting, balanced nutrient management, and natural farming approaches. These interventions helped increase his **productivity to 22-23 quintals per acre, more than doubling his earlier yield**.

The productivity gains were complemented by assured procurement through the FPO at the Minimum Support Price (MSP) of **₹4,886 per quintal (2025–26 season)**. This enabled him to access remunerative prices for his produce and realise higher returns. Consequently, his income from six acres increased from approximately ₹2.07 lakh to ₹6.59 lakh.

Shri Chikkana's experience demonstrates how the convergence of improved seed varieties, scientific cultivation practices, technical guidance, farmer collectives, and MSP-based procurement can strengthen farm productivity and economic returns.

How Minimum Support Prices Are Determined

The government announces **Minimum Support Prices (MSPs) annually for 22 mandated agricultural crops**. These MSPs are based on recommendations from the **Commission for Agricultural Costs and Prices (CACP)**. The recommendations consider the views of concerned **State Governments and Central Ministries/Departments**. Additionally, MSP for Toria and de-husked coconut are determined based on the MSPs announced for rapeseed and mustard, and copra, respectively.



The CACP considers **several factors while recommending MSPs** for different crops. These include:

- cost of production
- demand and supply of crops in domestic and global markets
- domestic and international prices
- inter-crop price parity
- terms of trade between agriculture and non-agriculture sectors
- likely impact of price policy on the wider economy, and
- a minimum margin of **50 percent over the cost of production**.

The cost of production used in MSP calculations includes paid-out expenses on hired human, bullock and machine labour, leased-in land, seeds, fertilisers, manure, and irrigation. It also accounts for diesel and electricity used to operate pump sets, depreciation on farm implements and buildings, interest on working capital, and other miscellaneous expenses. Additionally, the imputed value of family labour is included to recognise the contribution of family members engaged in agricultural activities. The same cost-estimation formula is applied **uniformly across all 22 mandated crops** and across States for calculating MSPs.

Rabi MSP 2027-28: Price Support and Crop Diversification

The government approved an **increase in the Minimum Support Prices (MSP) for all mandated Rabi Crops for Marketing Season 2027-28** on 30 September 2026.

RABI MARKETING SEASON 2027-28

S. N.	Crops	MSP 2027-28 (₹/ quintal)	Cost of Production 2027-28 (₹/quintal)	Margin Over Cost (%)	MSP 2026-27 (₹/ quintal)	Increase in MSP (Absolute)
1	Wheat	2,610	1,264	106	2,585	25
2	Barley	2,286	1,447	58	2,150	136
3	Gram	5,958	3,751	59	5,875	83

4	Lentil (Masur)	7,390	3,854	92	7,000	390
5	Rapeseed & Mustard	6,613	3,367	96	6,200	413
6	Safflower	7,215	4,810	50	6,540	675

The **highest absolute increase in MSP** has been announced for **safflower at ₹675 per quintal**. This is followed by **rapeseed & mustard at ₹413 per quintal**, **lentil (masur) at ₹390 per quintal**, and **barley at ₹136 per quintal**. MSPs for wheat and gram have also been increased compared with the previous year.

In terms of returns over the cost of production, wheat records the highest estimated margin at 106%, followed by rapeseed and mustard at 96%, lentil (masur) at 92%, and gram at 59%. During the Rabi Marketing Season (RMS) 2027-28, an estimated **₹90,962 crore** is expected to be paid to farmers for **324 lakh metric tonnes (MT)** of produce. The enhanced MSPs for rabi crops are intended to ensure remunerative prices for farmers while incentivizing crop diversification.



Ensuring Accessible and Transparent MSP Procurement

The procurement process has evolved to make MSP benefits more direct, transparent, and accessible to farmers. For **cereals and coarse cereals**, the Government undertakes procurement through the **Food Corporation of India (FCI)** and designated State agencies. This provides price support to farmers at the announced MSP.

Procurement of **pulses, oilseeds and copra** is undertaken under the **Price Support Scheme (PSS)** of the Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA). State Governments may request procurement when prevailing market prices fall below the announced MSP. The National Agricultural Cooperative Marketing Federation of India Ltd. **(NAFED)** and the National Co-operative Consumers' Federation of India Ltd. **(NCCF)** are key agencies responsible for undertaking procurement under the scheme. To promote domestic pulse production and strengthen self-reliance, tur, urad and masur are procured from pre-registered farmers through Central Nodal Agencies under the **Mission for Aatmanirbharta in Pulses till 2030-31**.

Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA)

Launched in September 2018, the scheme ensures remunerative prices for farmers while maintaining price stability for consumers. One of the key components is the **Price Support Scheme (PSS)**. It is activated when market prices of **notified pulses, oilseeds, and copra** fall below MSP during peak harvest. Eligible produce meeting **Fair Average Quality** (FAQ) standards is procured **directly from pre-registered farmers possessing valid land records** via **NAFED** and **NCCF**. This eliminates intermediaries and safeguards farmers from distress sales.

To improve farmers' access to procurement facilities, adequate numbers of procurement centres are established, with State Governments and procurement agencies publicising procurement schedules, centre locations and **Fair Average Quality (FAQ)** specifications for eligible produce.

The procurement process has also been strengthened through digital platforms. Under the Price Support Scheme (PSS), NAFED's **e-Samriddhi** and NCCF's **e-Samyukti** platforms facilitate key stages of procurement, including farmer registration, produce procurement and payment. Farmers register by providing details such as Aadhaar, land records, bank account information, and crop particulars. Registered farmers can select their nearest procurement centre, following which the portal schedules their visit for a specified date. Direct transfer of MSP payments to farmers' bank accounts helps reduce manual intervention, reliance on intermediaries, and payment delays.

As on **19 October 2026**, the e-Samyukti platform has facilitated procurement involving more than **43 lakh farmers**, with **over 37.45 lakh metric tonnes** procured and more than **₹13,000 crore** credited to farmers. Meanwhile, e-Samriddhi recorded more than **1.37 crore** registered farmers, over **2.25 crore units** of produce procured, and **81+ lakh payouts** to farmers.

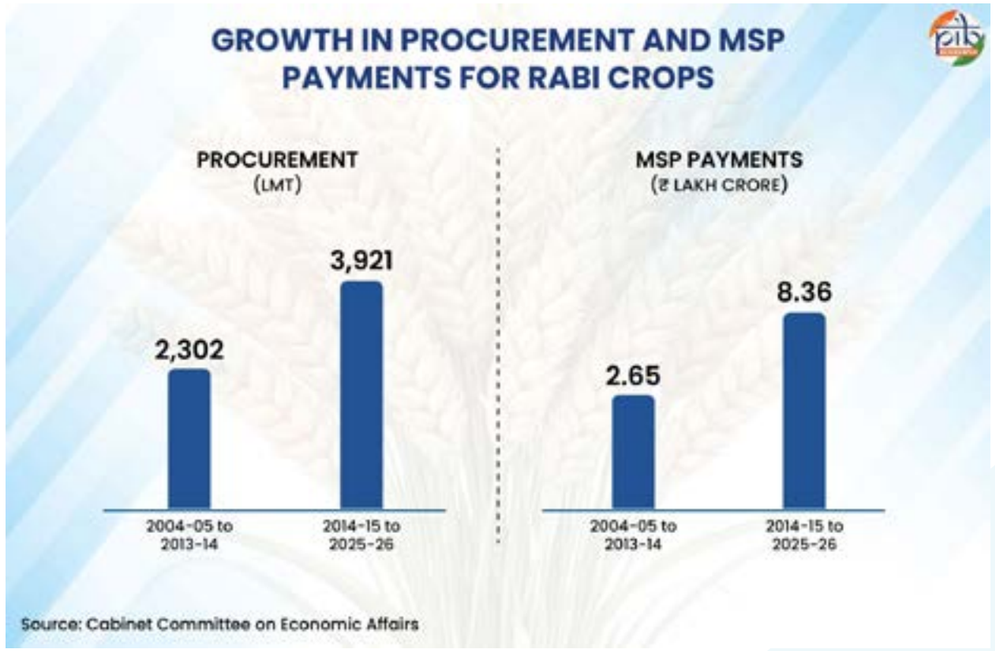
Further strengthening transparency and beneficiary verification, biometric authentication of farmers became mandatory under PSS from the 2025–26 season. Authentication is conducted

through **Aadhaar-enabled Point of Sale (PoS)** machines or facial authentication before procurement. This measure helps verify farmer identity and ensures that procurement benefits reach **genuine and eligible beneficiaries**.

The Expanding Scale of Procurement and MSP Payments to Farmers

The role of MSP in supporting agricultural procurement is reflected in the substantial increase in both procurement volumes and payments to farmers over the years. During **2014-15 to 2025-26**, wheat procurement totalled **3,715 lakh metric tonnes (LMT)**, compared with **2,254 LMT** during 2004-05 to 2013-14. Similarly, procurement across six rabi crops increased to **3,921 LMT** from **2,302 LMT** over the corresponding periods.

This growth in procurement has been accompanied by a significant rise in MSP payments to farmers. Between 2014-15 and 2025-26, payments to wheat farmers amounted to **₹7.31 lakh crore**, compared with **₹2.56 lakh crore** during 2004-05 to 2013-14. For the six rabi crops, cumulative MSP payments increased to **₹8.36 lakh crore**, up from **₹2.65 lakh crore** during the earlier period.



In Rabi Marketing Season (RMS) 2026-27, wheat procurement stood at **357.57 LMT**, with an MSP value of **₹92,432.51 crore**, benefiting over **34 lakh farmers**. These figures reflect the scale of government procurement and the financial support extended to farmers through MSP.

Supporting Farmers, Strengthening Agriculture

Minimum Support Price (MSP) remains an important policy instrument for supporting farmers against market price fluctuations and providing greater assurance in agricultural planning and investment. The MSP decisions for **Rabi Marketing Season (RMS) 2027-28** continue to provide for a **minimum margin of 50 percent** over the cost of production.

The sustained growth in **procurement volumes and MSP payments** reflects the expanding scale of government support to farmers. Meanwhile, digital registration, biometric authentication and direct bank transfers are strengthening the accessibility and transparency of procurement processes. Overall, these measures reinforce the link between price assurance, market access and remunerative returns, supporting farmers' income prospects and contributing to a more resilient agricultural sector.



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PIB Research





12

Navigating India’s Waterways: Building a Safer, Smarter Network

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India is building a safer and smarter inland navigation ecosystem as waterway traffic expands. Hydrographic surveys and fairway maintenance keep channels navigable, while India's first riverine lighthouses on the Brahmaputra add long-range support for 24×7 navigation. Digital platforms provide real-time depth, route and weather information. Together, these interventions are strengthening navigation safety, improving predictability and supporting the growing movement of cargo across India's waterways.

Strengthening Navigation as Waterways Expand

India's rivers and waterways are gaining a larger role in the country's transport network. They are being energised as a force multiplier for the economy, offering a cost-efficient and cleaner mode for transportation. Moving a tonne of freight by water costs roughly one-third of road transport and half of rail. It also generates a fraction of the carbon emissions. This eases pressure on highways and reserves them for passengers and time-sensitive goods.

The country has **111 National Waterways** (NW) to promote shipping and navigation. The total length of these waterways is 20,187 km, spread across 23 States and 4 Union Territories. Of these, **32 National Waterways** are currently operational. The growing economic value of waterways is reflected in their rapidly increasing freight movement. Cargo movement on inland waterways rose from **29 million metric tonnes (MMT)** in 2014–15 to **218 MMT** in 2025–26. This represents a Compound Annual Growth Rate (CAGR) of **20.13%.** The growth has already surpassed the target of 200 MMT set under **Maritime India Vision 2030.** Inland waterways are therefore moving from potential to performance.

This expansion of waterways is making it necessary to provide for safer and smarter navigation support and infrastructure that help understand river conditions and navigability across routes. Hydrographic surveys and fairway maintenance are being done to help vessels navigate changing river conditions. Digital platforms are providing information on depths, routes, vessel movement and weather. New navigation infrastructure, including India's first riverine lighthouses, is adding further support for round-the-clock movement.

Hydrographic Surveys: Knowing the Rivers

A river may appear unchanged from the surface, but the structure of its navigable channel is not visible from outside. Water levels also vary across seasons and river stretches. These changes can affect the route available to vessels. For this reason, inland waterway development requires continuous knowledge of river conditions.



Hydrographic surveys

Hydrography involves measuring and describing water bodies and their physical features, like structure of the bed, water depth, flow direction and possible hazards. The purpose is to support navigation and other activities like offshore operations, scientific research, environmental protection and forecasting services. A key objective of hydrographic surveys is to produce

navigation charts and maps that provide a clear, comprehensive and updated picture of the surveyed area.

The **Inland Waterways Authority of India** conducts hydrographic surveys across National Waterways. These surveys measure and analyse river depths, bed profiles, shoals, flow characteristics and morphological changes affecting navigability. These include **thalweg surveys** that identify and monitor the deepest navigable channel along the river stretch. Terminal & jetty surveys assess depth and approach conditions near **terminals and jetties,** etc. Continuous hydrographic assessment supports navigational channel (fairway) development, dredging plans, navigational safety and informed decisions for inland water transport (IWT) infrastructure development across the country.

River conditions can change rapidly in some stretches. Survey frequency therefore varies according to the requirements of individual waterways. As of **September 2026**, regular thalweg surveys covered **22 National Waterways.** Surveys are conducted weekly, fortnightly or monthly, depending on the waterway. The Indian portion of Indo-Bangladesh Protocol route was also covered under this monitoring system. This is an inland water transit network that enables cargo movement between India and Bangladesh through designated river routes.

Dredging is the process of removing sediments from the bottom of water bodies. Dredging work is carried out across stretches of National Waterways in order to improve their navigability.



Least Available Depth: A Critical Navigation Parameter

One of the most important outputs of hydrographic surveys is the **Least Available Depth (LAD)**. LAD refers to the minimum depth of water available in a navigation channel. It is assessed for a particular stretch and a specific period. LAD directly influences vessel operations and navigation planning. It determines the permissible vessel draft and influences cargo-carrying capacity. It also supports route scheduling and seasonal navigation decisions.

Aids to Navigation: Guiding Vessels Safely

Safe navigation depends on reliable systems that help vessels identify routes, hazards and changing conditions. Under the Marine Aids to Navigation Act, 2021, these systems are formally recognised as **Aids to Navigation (AtoN).**

An AtoN is a device, system or service external to vessels that is designed and operated to enhance safe and efficient navigation of individual vessels and vessel traffic. These include lighted buoys, radar beacons, lamp posts, channel markers, lighthouses, lightships, etc.

The Directorate General of Lighthouses and Lightships (DGLL) is responsible for the development, maintenance and management of general AtoN along India's coastline. It also serves as the national authority for training on AtoN and Vessel Traffic Services (VTS). India is a signatory to the International Convention for the Safety of Life at Sea (SOLAS), which requires contracting governments to develop and operate appropriate aids to navigation. India also follows the recommendations and guidelines on Aids to Navigation (AtoN) issued by the International Organization for Marine Aids to Navigation (IALA).

Across the national waterways, IWAI maintains a robust system of AToN.

Buoys- Floating objects anchored at a definite location to guide or warn mariners, to mark positions of submerged objects, or to moor vessels in lieu of anchoring. Type of buoys include lateral marks, cardinal marks, isolated danger marks, safe water marks, special marks, emergency wreck marking buoy.



Radar beacon (Racon)- Highly responsive, single piece device used by ports and harbor authorities to help mariners easily identify the location of fixed or floating Aids to Navigation. The device transmits in almost any type of weather, unaffected by fog or poor weather and sea conditions.



Different waterways use different combinations of these aids based on navigation requirements. **National Waterway-3** is a strong example of this infrastructure. NW-3, located in the State of Kerala, forms a critical component of the country's inland water transport network. The West Coast Canal system, connects Kottapuram to Kollam and extends through the Champakkara and Udyogamandal Canals. The entire navigable stretch is equipped with AtoN to support 24×7 navigation. A total of **312 solar-powered lighted FRP** (Fiberglass Reinforced Plastic) buoys and **17 beacon lamp** posts are deployed along this waterway.

Riverine Lighthouses: Bringing 24×7 Navigation Support

India's inland navigation system entered new territory in March 2026. India announced its **first four riverine lighthouses** on the Brahmaputra, designated as National Waterway-2. The development marks a significant step in strengthening Aids to Navigation on inland waterways. The four lighthouses are being established at **Pandu, Bogibeel, Silghat and Biswanath Ghat.** The **₹74-crore project** will combine navigational guidance with modern monitoring capabilities.

- The lighthouses will rise 20 metres above ground, providing prominent navigational reference points.
- Their geographical range will extend to 14 nautical miles, supporting wider navigational visibility.
- Their luminous range will extend between 8 and 10 nautical miles, aiding night-time vessel movement.
- Powered entirely by solar energy, it will provide a clean and reliable source for lighthouse operations.
- Weather-observation sensors will provide additional information relevant to navigation and safety.
- The complexes will also feature museums, amphitheatres, cafeterias and landscaped public spaces.
- Children's play areas and souvenir shops will add public and tourism-oriented facilities.

Why This Matters for the Brahmaputra

The initiative marks the first deployment of lighthouse infrastructure on an inland waterway in India. It brings a new navigation-safety mechanism to a river corridor with growing transport activity. NW-2 connects Assam's **Dhubri to Sadiya** across a navigable length of **891 kilometres.** It is the longest navigable stretch of any Indian waterway.

The waterway supports movement of cargo, passengers and tourists across the region. It also serves supply chains associated with **tea, coal and fertiliser.** Cargo movement on NW-2 increased from **0.90 million metric tonnes (MMT) in FY 2024–25 to 1.29 MMT in FY 2025–26.** This reinforces the need for stronger navigational infrastructure along the waterway. The new lighthouses will support **24×7 navigation.** The project therefore combines navigation safety, technological support and tourism development along the Brahmaputra.

Digital Navigation & Real-Time Information

Technology is transforming how vessels navigate India's inland waterways. Digital platforms bring together information on waterways, vessel movement, depth, weather and traffic. This enables mariners and authorities to access critical information when and where it is needed.

Digital Hydrographic Charts: Putting River Information on Screen

Navigation information is provided digitally to Mariners for enhanced safety through modern hydrographic charts. As of September 2026, Electronic Navigational Charts (ENCs) have been prepared for 18 operational and tidal waterways. They are uploaded on portals like PANI and IWAI Vessel Tracker. Before 2014, this facility was available only on NW-1 (the Ganga - Bhagirathi - Hooghly river system between Haldia and Prayagraj). Its expansion represents a significant widening of digitally accessible navigation information. The charts complement physical surveys by translating river information into a navigation-ready format.



Connecting Navigation with Real-Time Information

Navigation involves more than knowing channel depth. The Portal for Asset and Navigation Information (PANI) brings river navigation and infrastructure information on a single platform. PANI provides details about National Waterways and associated assets. These include fairways, infrastructure facilities and cross-river structures. The portal also provides jetty connectivity and emergency services for facilitating transportation of cargo.

The IWAI Vessel Tracker and PANI Portal together form a web and mobile-based e-navigation system. It provides real-time vessel tracking, updated navigation routes and depth information. These features support safe and efficient movement on inland waterways.

Naudarshika: Towards Integrated River Traffic Management

Naudarshika, the National River Traffic and Navigation System, has been launched in 2025 for safe, efficient and sustainable vessel movement. The system incorporates real-time Least Available Depth (LAD) information to support navigation. Alongside existing digital platforms such as PANI and LADIS, Naudarshika adds a dedicated system for river traffic and navigation management.

River Information Services: A Traffic Information Network

River Information Services take digital navigation a step further. RIS combines vessel tracking technologies, weather and water sensors and information technology systems. It provides real-time data to vessel operators and authorities. It also supports communication between vessels and control centres. This exchange supports better traffic management and faster operational decisions.

RIS on the Ganga

RIS has been implemented on National Waterway-1 (Ganga) across three stretches. These are Haldia–Farakka, Farakka–Patna and Patna–Varanasi. The system includes **4 control stations** and **13 base stations.** It incorporates Automatic Identification System (AIS)equipment and Very High Frequency (VHF) communication. Meteorological sensors are also part of the network. RIS consoles have been provided on 30 departmental vessels. Together, these components create a real-time traffic-monitoring system along NW-1.

A Connected Approach to Safer Navigation

Safe navigation on India's waterways is built on continuous knowledge, reliable infrastructure and timely information. Hydrographic surveys help understand changing river conditions, while navigation aids provide visible guidance on the water. Digital platforms are adding another layer of precision through real-time depth, route, weather and traffic information. Together, these systems are making inland navigation more predictable and responsive. As waterway traffic expands, this integrated approach helps create a stronger foundation for safe, efficient and round-the-clock vessel movement.

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PIB Research







13

Khadi & Village Industries: From Tradition to Enterprise

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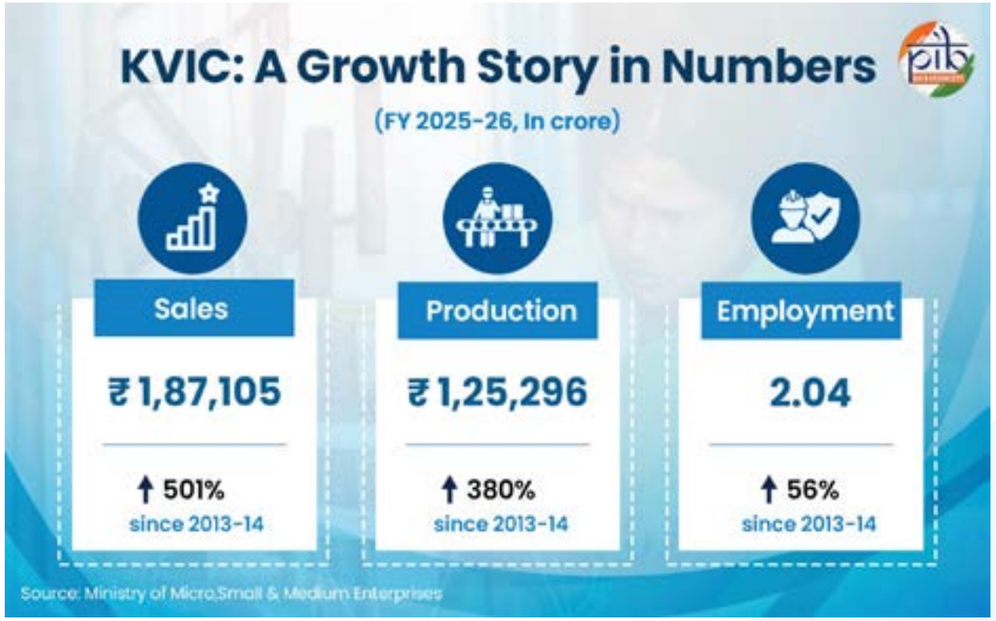
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A charkha spinning in a village once spoke of nationalism. Today, that spirit is taking new shape through a growing ecosystem of rural enterprises. Honey, herbal products, banana fibre, textiles and other village industries are creating new possibilities for traditional skills.

The spirit of self-reliance continues to resonate with the vision of **Vocal for Local and Atmanirbhar Bharat.** Traditional skills and local resources are finding new markets through access to finance, technology and training.

This growing connection between local enterprise and consumers is also reflected in the Khadi Mahotsav. The **Khadi Mahotsav takes place annually from 2 October to 31 October.** With a particular focus on youth, the campaign sensitises them towards Khadi and "Vocal for Local" and encourages the public to buy Khadi and local products.

At the centre of this transformation is the **Khadi and Village Industries Commission (KVIC).** It is a statutory body established under the Khadi and Village Industries Commission Act, 1956. The Act mandates KVIC to plan, promote, facilitate, organise and assist village industries. It covers measures related to **training, raw materials, marketing, research, and quality improvement.** It also supports skill development and research, while providing technical information and facilities related to Khadi and village industries.



In 2025–26, sales of Khadi and Village Industries products reached a historic ₹1.87lakh crore, the highest level recorded (as of May 2026). Compared with 2013–14, sales grew by 501%, while production increased by 380% to ₹1,25,296 crore. Employment in the sector increased by 56% to 2.04 crore. The remuneration paid to artisans has also increased. It rose from ₹4 per hank in 2013–14 to ₹15 per hank currently, an increase of approximately 275%.

One hank is equivalent to 840 yards of yarn in length and one pound by weight.

Building Rural Businesses, One Artisan at a Time

From acquiring skills to accessing markets, a range of interventions is supporting artisans and village industries.

KVIC has a network of **35 departmental and non-departmental training centres.** Training covers food products, bakery, beekeeping, agarbatti, candles, motor repairing and several other activities. During FY 2025-26, **79,682 trainees** received training under various KVIC training programs.



Women constitute more than **80% of approximately five lakh artisans** in the Khadi sector. In 2025–26, **47,382 women** received training under various KVIC programmes, accounting for approximately 59% of all trainees.

Training is complemented by interventions including toolkit and equipment distribution, marketing support and other measures.

Since March 2008, the **Prime Minister's Employment Generation Programme (PMEGP)** has provided employment opportunities to nearly 97.95 lakh people through KVIC.

One such beneficiary is Shri Jitendra Baitha, who established a bakery products manufacturing unit in Bihar in 2020. His venture has an annual turnover





of ₹72 lakh and currently provides employment to 20 people, in the local community.

Support also includes enterprise finance and the tools and technology needed for production.

The **Gramodyog Vikas Yojana** empowers artisans by providing modern machines, toolkits and equipment. During 2025–26, 37,769 such machines, toolkits and equipment were distributed. KVIC, under the scheme, has distributed more than 3.23 lakh machines, toolkits and equipment (May 2026).

These efforts are complemented by measures that strengthen the wider ecosystem in which Khadi institutions and artisans operate.

The **Khadi Vikas Yojana** helps Khadi institutions improve products, add value and respond to changing market demand. Its **Modified Market Development Assistance** provides greater flexibility for value addition and market-oriented pricing. During 2024–25, ₹245 crore was disbursed to 1,097 Khadi Institutions, benefiting 1,45,484 artisans.

Access to affordable credit adds another layer of support. Under the **Interest Subsidy Eligibility Certificate Scheme,** eligible Khadi institutions can access credit at a concessional interest rate of 4% per annum.

For artisans, the workplace itself also matters. The **Worksheds Scheme** provides improved production spaces and a more congenial working environment. During 2025–26, up to December 2025, 1,309 artisans benefited under the scheme.

These measures support artisans with improved working conditions and access to resources for production.

From Village Enterprises to Wider Markets

Across village industries, traditional skills and local resources are being developed into new businesses and products, supported by technology, training and market linkages. Research and development efforts are strengthening productivity, quality and competitiveness.

Shri S.P. Singh built his enterprise around **honey and cookies,** with support under the **PMEGP scheme through KVIC.** Based in Punjab, his business now provides employment to around 200 workers and exports its products to international markets. Honey and cookies are among its key products, with the United States accounting for a major share of exports.

After receiving support in 2010, the enterprise gradually expanded its export presence through participation in international exhibitions. **KVIC facilitated participation in exhibitions across Dubai, the United States and the Middle East, helping the enterprise connect with overseas buyers.** Today, the business exports to 36 countries and is developing a second unit in Rajpura, Punjab, to expand honey exports to European markets.

For **Shri B. Sundaraj**, a naturally fragrant plant became the foundation for a village enterprise. Through his Agarbathi Unit, he produces agarbatti, herbal products, Vetiver Agarbathi and Vetiver Samburani. With support under the Gramodyog Vikas Yojana (GVY) during 2024-25, he strengthened his manufacturing capabilities and diversified his product range. This enables him to develop multiple value-added products from a locally available resource. His enterprise



illustrates how **KVIC support can help translate traditional knowledge and local resources into marketable village industry products.**

In Jatti Majra village of **Solan district, Himachal Pradesh**, Shri Sahil Chaudhary runs a mono-carton manufacturing unit. The enterprise caters to construction and packaging requirements in the region. **Established with a project cost of ₹25 lakh, the unit operates under KVIC-supported PMEGP.**

The enterprise now records an annual turnover of around ₹45 lakh and provides employment to 23 people. The financial assistance helped translate Chaudhary's entrepreneurial idea into a functioning manufacturing enterprise. His journey illustrates how local entrepreneurship can contribute to self-reliance, employment and the broader vision of Atmanirbhar Bharat.

Opening New Markets for Village Enterprises

KVIC has expanded both digital and physical channels for reaching consumers. It has an online Khadi India

store (www.khadiindia.gov.in) offering a range of products, including clothing and fabrics, grocery, beauty products, essential oils, perfumes and incense sticks.

The Khadi India brand is supported through dedicated publicity and marketing initiatives. These efforts connect traditional products with contemporary consumers. The marketing network extends across the country. It includes **8 departmental Khadi India sales outlets and 15 KVIC branches.** Khadi Institutions operate another 8,035 sales outlets nationwide.

National, zonal, state and district exhibitions provide additional market opportunities. KVIC also promotes participation in domestic and international trade fairs.

From Heritage to Opportunity

The growth of Khadi and Village Industries is reflected in **higher production and sales, expanding employment, increased artisan remuneration and new rural businesses.** As traditional skills connect with technology, finance and markets, the sector continues to open new avenues for enterprise across rural India.

Khadi: Weaving a Global Story



Khadi is finding new expressions in fashion, with its distinctive craftsmanship showcased at platforms such as **New Zealand Fashion Week 2026 and Lakmé Fashion Week 2025.** In these events, the heritage techniques were brought together with contemporary designs to create a distinctly modern identity.

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Towards a TB-Free India

Progress, Innovation and Community Participation

Published on: 16 October 2026

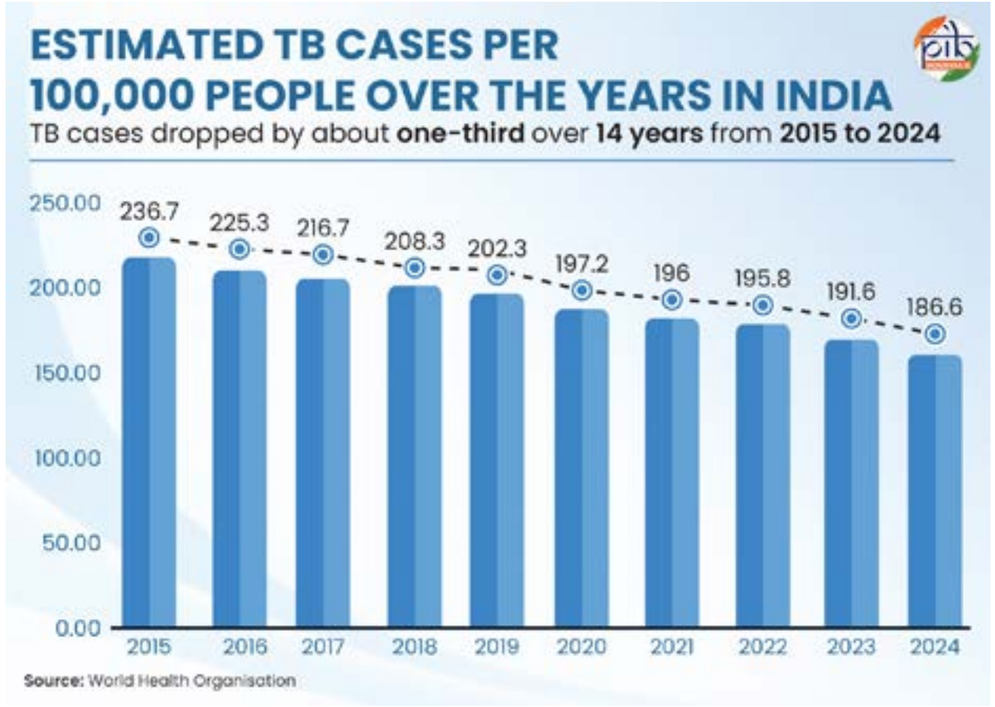
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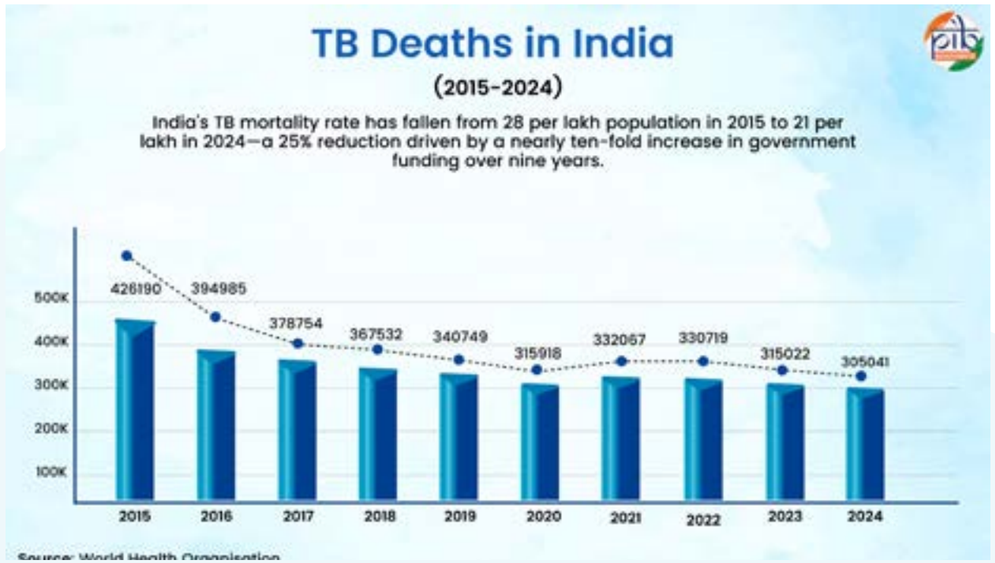
India's fight against tuberculosis has achieved significant milestones, with yearly emerging cases dipping by 21%, compared to the global decline of 12% between 2015 and 2024. India's treatment coverage is 92% versus global coverage of 78%. Driven by the intensified TB Mukt Bharat Abhiyaan, cumulative screenings have crossed 28.1 crore, with over 20 lakh individuals provided TB Preventive Treatment (TPT), 5.7 lakh new Nikshay Mitras added, and 46,118 Gram Panchayats awarded TB-free certification. The national response has been substantially accelerated through a 34-fold increase in X-ray screening via handheld units, the rollout of the TB Mukt Bharat App featuring the AI chatbot 'Khushi', and the introduction of the shorter, safer BPaLM (Bedaquiline, Pretomanid, Linezolid, and Moxifloxacin) treatment regimen for drug-resistant patients alongside advanced AI-driven triage tools. Building on this progress, the JOSH (Joint Squad for Health) campaign mobilises young people and communities to promote TB awareness, early detection, timely treatment, and treatment adherence, while addressing stigma. By strengthening community participation and collective action, the campaign reinforces the Jan Andolan approach towards achieving a TB-free India.

Introduction

India is on track towards tuberculosis elimination. New cases of tuberculosis emerging yearly in India have been reduced by 21% from 2015-2024 as compared to the global decline of 12%, according to the World Health Organisation's Global Tuberculosis Report 2025. India's treatment coverage is 92% versus global coverage of 78%.

This marks one of the most significant declines in TB incidence globally, exceeding the pace of reduction recorded in other high-burden nations. Deaths due to TB reduced by 28% during the same period. The Government of India's targeted, multi-pronged approach towards detecting, screening and treating tuberculosis has contributed significantly to this progressive trend. Advanced technology expanded local health services, community engagement, and affordable treatment have put India on track to eliminate this prevalent and potentially fatal disease.





JOSH Campaign to Mobilise Communities Towards TB Elimination

To further amplify this momentum towards eliminating TB, a nationwide social media campaign featuring JOSH (Joint Squad for Health) Teams – across 11 states and 55 districts on a pilot basis – was organised on 13th October 2026. Every JOSH team has MY BHARAT volunteers, cadets from the National Cadet Corps, and a designated Class-I officer to spread awareness on timely



screening and treatment.

This structure mobilises the youth towards grassroots community awareness. All ministries, departments, healthcare institutions, MY Bharat volunteers and youth organisations, students and citizens are encouraged to join in amplifying TB awareness, early detection, treatment adherence and stigma-free communities through posts, photographs, videos and inspiring stories highlighting youth-led action.

The Ministry of Health and Family Welfare held workshops on the TB Mukt Abhiyaan with members of the Parliament and Legislative Assemblies. However, to take this campaign forward, involving the communities was deemed crucial. The JOSH campaign endeavours to be the next step in increasing community participation, highlighting the importance of screening and early detection. The campaign highlights the requirement for diagnosis and treatment, along with community participation, to increase active screening and to find asymptomatic patients.

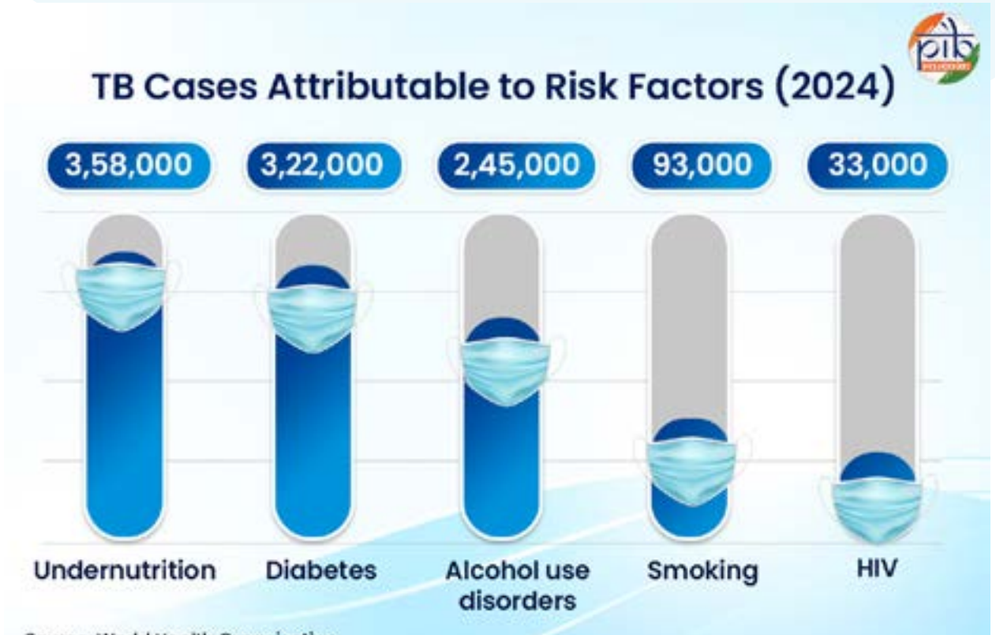
This community participation and awareness building, particularly in vulnerable and marginalised populations, is crucial for removing fear and increasing awareness in people about treatment and screening as well. Together with the initiative, this campaign is aimed at making TB Mukt Bharat a reality through both institutional support and community mobilisation.

TB and Symptoms

What is Tuberculosis?

Tuberculosis (TB) is caused by a bacterium called **Mycobacterium tuberculosis,** usually impacting the lungs. TB can also affect other parts of the body, such as the brain, kidneys, or the spine.

A person infected by the bacterium may become sick, but some do not. Inactive TB cases or latent TB infections also exist. People with inactive TB may not spread the disease to others like those with an active TB infection– yet they may develop active TB anytime and become sick. **Babies and children, and people with weaker immune systems, are more likely to get sick** when infected. Without proper treatment, **active TB can be fatal.**



TB Symptoms

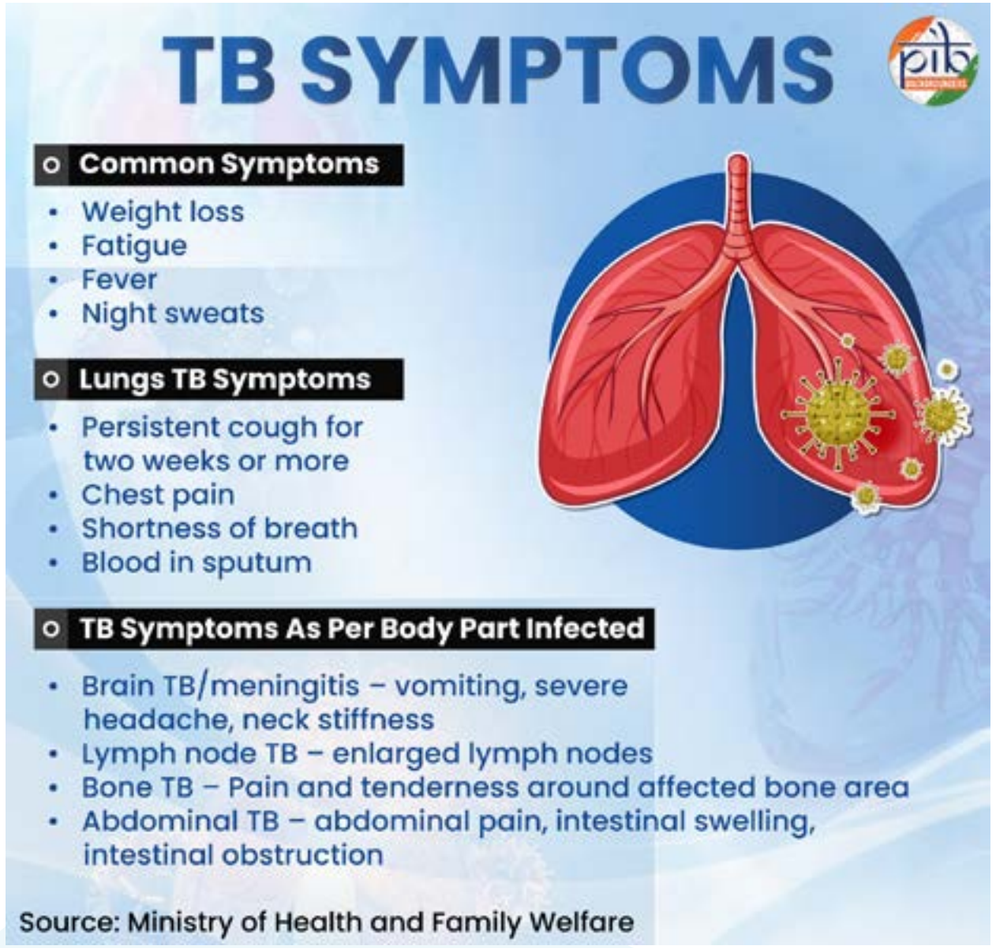
Symptoms of active TB are usually specific to the site affected by the bacteria, though there are some symptoms common to all types of TB.

People with active or symptomatic TB can spread the TB bacteria to others. When they cough, sneeze or speak, tiny droplets containing the bacteria can be released into the air and inhaled by people nearby—especially in spaces with poor ventilation.

Although tuberculosis spreads through the air, it does not transmit through:

- Handshakes
- Using public toilets
- Sharing food and utensils
- Everyday social interactions

Patients with lung TB generally stop being contagious after they have been on appropriate TB medicines for at least two weeks. People with TB in parts of the body other than the lungs usually cannot spread the disease.



What Should You Do If You Notice Symptoms?

The National TB Elimination Programme provides free screening and treatment services across the country at all public health facilities and many private healthcare centres, too. If you or anyone you know is showing TB symptoms:

- Call the toll-free Ni-kshay Sampark TB& Hepatitis helpline: 1800-11-6666 for guidance and visit your nearest government health centre – TB diagnosis and treatment are provided free of cost under government programs.

- You can also download the TB Aarogya Sathi app on your Android phone for more information on symptoms and nearby health facilities. The app helps you locate the closest centres offering TB diagnosis and treatment and provides guidance on medication side effects as well as nutritional advice for TB patients.

Strategic Plan to End TB in India

The Government is committed to eliminating tuberculosis (TB), in alignment with Sustainable Development Goal 3 (SDG 3), which seeks to ensure healthy lives and promote well-being for all. The **National Strategic Plan to End TB in India 2020-25**, announced in June 2020, aims to eliminate tuberculosis through four pillars: **Build, Prevent, Detect, and Treat**. The plan focuses **on early diagnosis, reducing transmission, treating patients with appropriate drugs and regimens, and creating patient support systems.**



National Tuberculosis Elimination Programme

In **2020,** the Government of India renamed the Revised National Tuberculosis Control Program (RNTCP) to the **National TB Elimination Program (NTEP).** This reflects India's goal to **eliminate tuberculosis before the global target of 2030.**The NTEP builds on the four pillars of the NSP: **Detect – Treat – Prevent – Build.** The key activities of the programme are:

- Early diagnosis of individuals with TB through high-quality testing, and proactive community outreach to find missing cases in vulnerable populations.
- Prompt treatment with quality-assured drugs and treatment regimens, including drug-resistant TB.
- Engaging with patients seeking care in the private sector.
- Patient-centric treatment support and nutrition interventions through direct benefit transfer and the Ni-kshay Mitra initiative.
- Contact tracing and TB preventive treatment among household contacts, children, people living with HIV (PLHIV), and in high risk / vulnerable populations.
- Airborne infection control measures.
- Multi-sectoral response for addressing social determinants.

The government runs various programmes under NTEP.

Pradhan Mantri TB Mukt Bharat Abhiyaan

The Pradhan Mantri-TB Mukt Bharat Abhiyaan (TB-Free India Campaign) was launched on September 9, 2022, as an **additional key component of the NTEP.** This initiative was launched to unite people from all walks of life in a 'Jan Andolan' (people's movement) and accelerate the nation's progress towards eliminating TB. Its objectives are:

- Provide Additional Support to TB Patients to improve treatment outcomes
- Augment Community Involvement
- Leverage Corporate Social Responsibility (CSR)

Nikshay Poshan Yojana and the Ni-kshay Mitra Programme

TB patients must eat a high-protein diet to counteract the adverse side-effects of the treatment drugs. The Nikshay Poshan Yojana, launched in 2018, provides **financial assistance of**

Rs. 1,000 per month to each notified tuberculosis patient. Since its launch **in April 2018, Rs.4,454.68 crores have been disbursed directly into the bank accounts of 1.38 crore beneficiaries.**

TB treatment is long, lasting at least 6 months, and sometimes even longer. A Ni-kshay Mitra is a "TB Friend" or supporter who provides TB patients with help during this treatment period. A person, an NGO, corporations, religious and community groups, government officials and public figures can volunteer to be Ni-kshay Mitras.

The TB Friend provides **regular food baskets** to help patients reduce out-of-pocket expenditures. They can also provide **psychosocial support** by checking in regularly, and **vocational support** to help patients rebuild their lives after recovery.

As of November 12, 2025:

- **6,77,541 individuals and organisations,** as Ni-kshay Mitras, distributed **over 45 lakh food baskets to TB patients.**
- **Over 2 lakh MY Bharat volunteers have come forward to serve as Ni-kshay Mitras. MY Bharat is an initiative by the Ministry of Youth Affairs and Sports which connects 15-29-year-old people to various government departments, private organisations and civil-society partnerships to address real-world challenges and issues.**

100-Day TB Mukt Bharat Abhiyaan

The Ministry of Health and Family Welfare launched one of India's most intensive TB elimination drives called the 100-Day TB Mukt Bharat Abhiyan on 7th December 2024 in 347 high-priority districts across 33 States/UTs. To achieve early diagnosis of TB, vulnerability mapping and systematic screening of high-risk populations for TB were undertaken. The Jan Andolan also led to active involvement of over 30,000 elected representatives and 24 line ministries and support of Ni-kshay Mitras, exhibiting a whole-of-society and whole-of-government approach to TB elimination. The strategies of TB Mukt Bharat Abhiyaan have now been scaled up and expanded nationwide across all districts.

As of June 2026, the intensified campaign has crossed major milestones: **over 28.1 crore** people screened, **20 lakh individuals** provided TB Preventive Treatment (TPT), and 5.7 **lakh new Nikshay Mitras added.**

During the second phase of the campaign starting March 2026, **over 1.7 lakh Ayushman Arogya Shivirs** were held across **1.2 lakh high-risk villages and wards,** backed by active participation from 32 lakh students and **1.9 lakh MY Bharat volunteers.** The treatment success rate under the TB Mukt Bharat Abhiyan has **risen to 90%**, surpassing the global **average of 88%.**

New Initiatives

New shorter, safer and highly effective **BPaLM regimen** having Bedaquiline, Pretomanid, Linezolid and Moxifloxacin has been introduced under the programme for drug-resistant TB patients, which will reduce the duration of treatment to 6 months. More than 15,000 MDR/RR-TB patients have been initiated on this regimen.



TB Preventive treatment: Recognising that prevention is as critical as cure, TB Preventive Treatment (TPT) is provided to eligible beneficiaries to prevent the progression of TB infection to active disease. Through targeted and innovative approach, the programme has successfully protected household contacts and people living with HIV (PLHIV) over the years by administering TPT. The intervention has also been integrated with active and intensive case-finding campaigns and expansion to other vulnerable groups.

Ayushman Arogya Mandirs

Ayushman Arogya Mandirs are community health centres under the larger Ayushman Bharat scheme providing universal and affordable healthcare to all. There are 1,87,250 Ayushman Arogya Mandirs in India (as on October 13, 2026) – including sub-health centres, primary health centres, urban primary health centres, AYUSH (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy) centres and Urban Health and Wellness Centres. People showing TB symptoms can go to these centres to get diagnosed.

Healthcare workers at an Ayushman Arogya Mandir in Himachal Pradesh's Kullu district screen women for TB and other diseases (September 20, 2025), Ministry of Health and Family Welfare



Technological Infrastructure

More than 9800 rapid molecular testing facilities and 107 culture and drug susceptibility testing laboratories exist – the world's largest network – for early TB detection and care. Other tools are:

- **Over 500 AI-enabled hand-held chest X-ray units** for community screening, with 1,500 being delivered to the states and union territories
- Ni-kshay digital platform facilitates direct benefit transfer of nutritional support
- **34-Fold Surge in X-Ray Screening:** Driven by the large-scale deployment of handheld X-ray units nationwide.
- **TB Mukt Bharat App & 'Khushi' Chatbot:** A newly launched digital platform integrated with an AI-powered chatbot to track progress, guide citizens on symptoms, and locate nearby diagnostic centers.
- **Capacity Building:** The Ministry has expanded radiographer positions under the National Health Mission alongside expanding Truenat and CBNAAT diagnostic machinery.

Finding TB Cases in Remote Kashmir

In the isolated Gurez valley of Bandipora District, Kashmir—located 2,400 metres high in the Himalayas and cut off during winter-the NTEP Kashmir team conducted an intensive TB screening campaign. Using mobile testing vans equipped with advanced diagnostic machines and portable X-ray equipment, the team screened 1,250 people over three days and identified over 250 potential TB cases for further testing. They also conducted awareness sessions with the Indian Army, local health workers, village representatives, and religious leaders. This effort reflects Jammu and Kashmir's commitment to achieving a "TB-free Kashmir" by 2025.

AI-Led Initiatives

The government is using AI systems for the detection, diagnosis, and treatment of tuberculosis in its push to integrate the technology into healthcare delivery to improve access and speed of care. These are:

Health Focus	AI Solution / Initiative	Process, Technology "Treatment" Experience	Clinical / Operational Impact
TB Screening	**Cough Against TB (CATB)**	**Acoustic AI: A 3-second recording of a patient's cough via smartphone app analyses frequency patterns for TB Signatures.**	**1.62+ Lakh screened; 12–16% extra yield in cases over conventional methods.**

TB Management	**Adverse Outcome Prediction**	**Predictive Analytics: AI flags patients at high risk of treatment failure, once flagged treatment is initiated.**	**Reported 27% decline in adverse outcomes after nationwide deployment.**
TB Triage	**DeepCXR (Chest X-ray)**	**Radiology AI: Automated reading of digital X-rays to identify nodules/cavities for presumptive TB cases.**	**Deployed in 8 State/UTs; available free of cost to the Govt to bypass specialist shortages.**

Gearing Towards Eliminating TB

India's steady decline in TB incidence is a powerful reminder that sustained commitment, community participation, and strong public health initiatives truly make a difference. With continued vigilance, expanded access to care, and collective responsibility, the country is moving closer to a future where TB-free India is not just a goal, but an achievable reality. The JOSH social media campaign endeavours to increase TB awareness and help in mobilizing communities towards eliminating TB. Through these initiatives spanning healthcare institutions at all levels, the youth, and communities, India is gearing towards eliminating a dangerous and prevalent disease to create a Viksit Bharat 2047.

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India’s Rising Supercomputing Ecosystem

Published on: 04 October 2026

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India's supercomputing journey has evolved from PARAM 8000 in the early 1990s to a national ecosystem under the National Supercomputing Mission (NSM), launched in 2015. With 40 supercomputers delivering 68 PF as of September 2026, NSM is expanding access to high-performance computing (HPC). The Mission has also developed indigenous servers, software, cooling and networking technologies, while supporting applications in Computational Biology, Weather Prediction and Climate Modelling, Disaster Management, Big Data Analytics, and Astrophysics.

Building India's Supercomputing Capabilities

From predicting crop yields and tracking disease outbreaks to accelerating drug discovery and predicting affected areas due to river floods, high-performance computing supports societal applications that affect everyday life. They help process massive datasets and support complex simulations across climate, space, healthcare and engineering. They also enable faster analysis and help researchers address increasingly complex scientific challenges. It is becoming essential for accelerating scientific discovery and technological innovation

Supercomputers are high-performance computing systems designed to process complex calculations at exceptional speeds. They combine large numbers of processors to perform multiple calculations simultaneously. This enables researchers to analyse massive datasets and run sophisticated simulations efficiently. Supercomputers therefore provide critical infrastructure for advanced scientific research and strategic applications.

India's growing digital ecosystem is driving demand for advanced computing infrastructure. India generates nearly **20% of the world's data.** Applications such as Artificial Intelligence, weather forecasting and space research require significant computing capabilities. The Government is therefore expanding access to supercomputing across research institutions. This effort strengthens indigenous capabilities and supports India's vision of Aatmanirbhar Bharat.



The Strategy Behind National Supercomputing Mission

India launched the National Supercomputing Mission (NSM) in April 2015 to strengthen the country's computing capabilities. The Mission was launched with an outlay of about ₹4,500 crore. It is jointly steered by the Department of Science and Technology (DST) and the Ministry of Electronics and Information Technology (MeitY).

The Mission aims to build self-reliance in supercomputing and strengthen India's high-performance computing capabilities. It promotes the use of supercomputing for research, development and problem-solving across scientific and technological domains. It also supports the development of solutions for societal applications. The Mission seeks to establish a globally competitive supercomputing ecosystem in India.

Interesting Facts About the Supercomputers

- Unlike regular computers, supercomputers are designed to process large amounts of data at very high speeds. They use multiple processors or computing nodes that work together simultaneously. This allows them to solve complex problems much faster than conventional computers. High-speed connections between these nodes enable them to exchange data efficiently during large-scale computations.
- Supercomputers are sometimes called **parallel computers** because supercomputing can use parallel processing. Parallel processing is when multiple CPUs work on solving a single calculation at a given time.
- A supercomputer's power is measured in **FLOPS (Floating Point Operations Per Second).** This tells us how many calculations it can perform in one second. One teraFLOPS (TF) means one trillion calculations per second, while one petaFLOPS (PF) means one quadrillion calculations per second.
- The **world's fastest supercomputer** achieves around 2.19 exaflops in 2026. It can perform about 2.19 quintillion calculations per second.

The Centre for Development of Advanced Computing (C-DAC), Pune, and the Indian Institute of Science (IISc), Bengaluru, implement the Mission. NSM follows a 'Build approach' consisting of three concurrent phases to create indigenous supercomputing infrastructure: assembly, manufacturing, and design and manufacturing support. This approach combines the expansion of computing infrastructure with the development of indigenous capabilities.

Current Status of the Mission

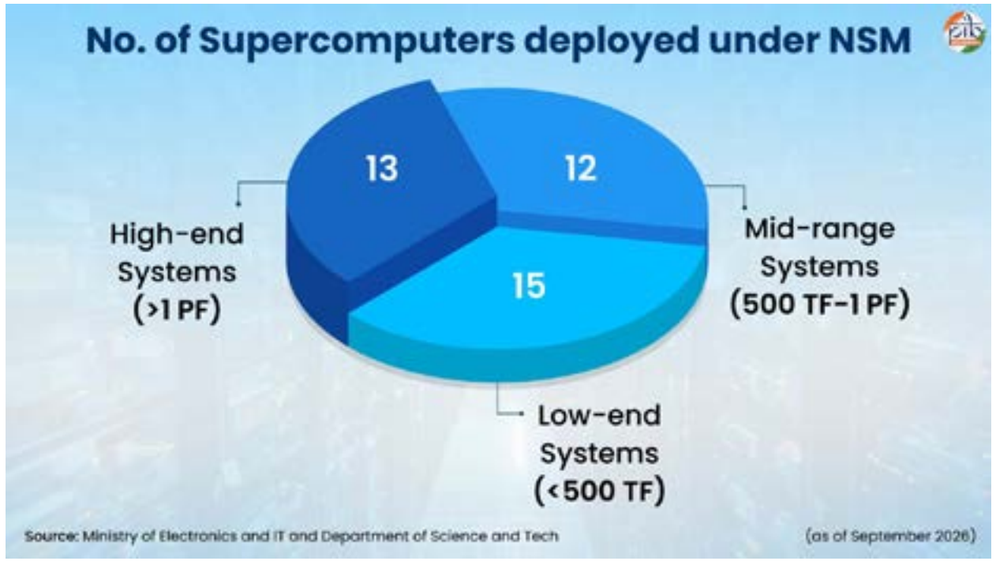
Under NSM, India has established an ecosystem focused on achieving self-reliance in supercomputing. It covers supercomputer design, development, manufacturing, system software and specialised applications. This growing indigenous capability can reduce dependence on imported technologies. It also strengthens India's domestic high-performance computing ecosystem.

NSM plans to establish a total of 50 supercomputers with a cumulative capacity exceeding 123 PF across various academic/research institutions across India. These systems cater to diverse computational requirements based on their processing capacities.

Expanding Computing Capacity

As of September 2026, India had deployed 40 supercomputers with a combined capacity of 68 PF. This includes 13 high-end systems exceeding 1 PF. Additionally, 12 mid-range systems have capacities between 500 TF and 1 PF. Another 15 systems have capacities below 500 TF. These machines have been built locally and commissioned across the country. The Mission continues to advance infrastructure, applications, research and development, and human resource development.





Evolution of PARAM Series

PARAM 8000, developed by C-DAC and unveiled in 1991, marked India's entry into indigenous supercomputing with a speed of 1 gigaflop. It laid the foundation for the PARAM series, which evolved through increasingly powerful systems such as PARAM Yuva at 54 teraflops, supporting computationally intensive applications. This supported applications such as weather forecasting, which predicts atmospheric conditions, and computational fluid dynamics, which studies fluid flow, etc. The series later expanded India's supercomputing capabilities for both domestic research and international deployments.

National Applications of Supercomputing under NSM

Supercomputers deployed under NSM support large-scale simulations and fast data processing, enabling national applications across various sectors. applications across various sectors.

- **Genomics and Drug Discovery Platform:** It studies large sets of molecules to help find and test

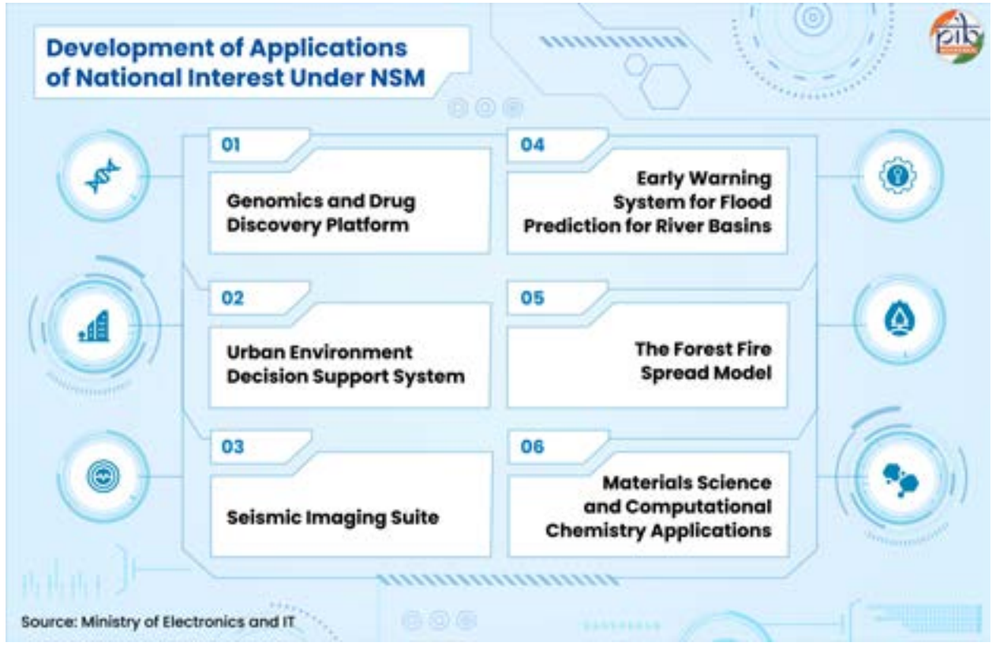
Supercomputing for Sustainable Development

NSM contributes to 11 United Nations Sustainable Development Goals (SDGs) by applying advanced computing to areas of national development. Its applications support climate action through flood prediction, forest-fire management and climate modelling, while strengthening education and skill development through HPC training. The Mission also promotes innovation, indigenous technology, economic growth and collaboration among academia, industry and research institutions.

drugs. It was used during COVID-19 to screen existing drugs and also predict side effects like heart risk.

- **Urban Environment Decision Support System:** It uses detailed models to track weather and air pollution. It predicts heavy rain and pollution so cities can prepare and mitigate damage.
- **Seismic Imaging Suite:** It aims to improve oil and gas exploration by using advanced algorithms to map subsurface structures. Its performance matches commercial seismic imaging tools.
- **Early Warning System for Flood Prediction for River Basins:** It leverages data analysis and predictive models to forecast floods up to 2 days in advance. It is being used for the Mahanadi River basin to protect communities and infrastructure.
- **The Forest Fire Spread Model:** It combines satellite remote sensing with computational models to predict how forest fires will spread. It has been tested in regions like the Sikkim Himalayas using a HPC system.
- **Materials Science and Computational Chemistry Applications:** It provides a suite that allows simulations of atoms, molecules, and alloys. These facilitate the study of their behaviour.

These applications demonstrate how India's growing HPC infrastructure is strengthening research, supporting evidence-based decision-making and addressing complex challenges across health, environment, energy and advanced science.



Achievements: Indigenous Components Developed Under NSM

- Under the NSM, a complete ecosystem has been established with the focused goal of achieving self-reliance in supercomputing. It includes, inter alia, the design, development, and manufacturing of critical supercomputing sub-components, as follows:
- **Rudra Series of Servers:** It is a key supercomputing component. It provides the processing power needed to run complex calculations, simulations and AI workloads. It has been indigenously designed and developed by C-DAC, with its technology transferred to Indian Electronics Manufacturing Services (EMS) partners for manufacturing.
- **High-Speed Interconnect Network:** A high-speed inter-communication network between computer nodes has been developed and tested with speeds of 100 Gbps and 200 Gbps. It enhances data transfer and communication between computing nodes, strengthening India's supercomputing capabilities.
- **Indigenous Cooling Technology:** Cooling technology has been indigenously developed and

PARAM Rudra Series: Advancing Indigenous Supercomputing

A major milestone of NSM has been the development of the PARAM Rudra supercomputers, built using indigenously designed and manufactured Rudra servers and an indigenous system software stack. They support a wide range of applications like advanced research in astronomy, material science, atomic physics, and earth sciences. As of September 2026, 6,000 Rudra servers had been deployed in PARAM Rudra supercomputers, with another 1,500 servers under manufacturing.

demonstrated and is now in the deployment stage. It is important for maintaining the operating temperature of high-performance computing systems and have better power efficiency.

- **High Performance Computing (HPC) System Software:** A complete HPC system software stack has been developed and integrated with supercomputing systems to support their efficient operation and management.
- **PARAM Shavak:** It is a **supercomputing-in-a-box** that has been designed, developed and manufactured in India to meet the HPC and AI computing needs of students and researchers in engineering colleges and universities.
- **HPC Applications for National Needs:** HPC applications have been developed and deployed across areas such as genomics and drug discovery. These applications support organisations including the India Meteorological Department (IMD), Central Water Commission (CWC), Central Pollution Control Board (CPCB), and the Ministry of AYUSH.

From core computing infrastructure to applications addressing national needs, NSM is expanding India's capacity to develop and use advanced computing technologies within the country.

Building a Skilled Workforce for High-Performance Computing in India

As access to supercomputing infrastructure expands, NSM is also building the skills needed to use these resources effectively. NSM infrastructure has supported over 16,000 researchers, including more than 2,900 PhD scholars, across over 400 institutions. These systems have executed more than 1.5 crore compute jobs (a complex task or simulation assigned to a supercomputer) and contributed to over 1,990 research publications, as of September 2026.
To further expand the skilled user base, the Mission has developed a range of training and learning initiatives:

- **HPC and Deep Learning Awareness Programmes:** Workshops are conducted across India with NSM institutions to introduce students, researchers and faculty to High-Performance Computing (HPC) and Deep Learning (DL).
- **Hackathons and Bootcamps:** HPC and DL hackathons and bootcamps provide hands-on experience and encourage problem-solving in HPC, Artificial Intelligence (AI) and Generative AI.
- **Faculty Development and Quality Improvement Programmes:** Faculty, including teachers from non-computer science disciplines, are trained in HPC, AI, Machine Learning (ML) and DL in collaboration with the All-India Council for Technical Education (AICTE).
- **EduHPC Workshop:** An annual workshop provides comprehensive training in HPC to faculty from institutions across India.
- **High-Performance Scientific Computing Course:** A structured course on the SWAYAM platform, under the National Programme on Technology Enhanced Learning (NPTEL), helps learners build a strong foundation in HPC.

National Knowledge Network (NKN)

The NKN serves as the backbone of India's supercomputing ecosystem under the National Supercomputing Mission. It connects supercomputing facilities across academic and research institutions through a high-speed national network. This enables researchers and institutions to access advanced computing resources and collaborate across geographical boundaries. The network strengthens the sharing of computational resources, research capabilities and scientific knowledge. Through this connected infrastructure, the Mission is expanding access to High-Performance Computing across India.

- **HPC Shiksha Portal:** The portal provides access to HPC resources, recorded lectures and learning materials, enabling students and teachers to gain practical experience.
- **NSM Users Forum:** The forum provides a platform for users across NSM sites to discuss technical issues, resolve queries and share knowledge and best practices.

These initiatives are expanding HPC skills beyond specialised computing institutions and building a broader workforce equipped to use advanced computing.

Way Forward

India's supercomputing ecosystem is set to grow significantly by expanding computing capacity, developing more advanced technologies within the country, and making high-performance computing (HPC) more accessible to researchers, academia and industry. The focus of the mission will be on building faster, energy-efficient and reliable systems, strengthening Indian hardware and software capabilities, and developing skilled professionals. Greater integration of Artificial Intelligence (AI) and HPC will help address important challenges in areas such as weather and climate, healthcare, agriculture, energy, drug discovery, engineering and scientific research. By bringing together government, academia, industry, startups and research institutions, India can turn advanced computing into practical solutions, drive innovation and economic growth, and build a secure, sustainable and self-reliant supercomputing ecosystem.

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24th Instalment of PM-KISAN

Direct Benefit Transfer of over ₹18,690 crore to 9.34 crore farmers

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PM-KISAN provides eligible farmer families **₹6,000 annually** in **three instalments**, supporting **agricultural investments** and **household financial stability**. The 24th instalment transferred over ₹18,690 crore to 9.34 crore farmers, taking cumulative disbursements beyond **₹4.64 lakh crore**. Aadhaar-linked bank accounts, Direct Benefit Transfer, e-KYC and digital verification strengthen transparency and reduce intermediaries. The scheme's continuation until **2030-31**, backed by a **₹3.15 lakh crore** financial outlay, reinforces sustained support for farmer income security.

PM-KISAN: Strengthening Income Security for Farmers

The government has released the 24th instalment of the **Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)** on 30 October 2026, at **Banaskantha, Gujarat.** More than **9.34 crore** eligible farmers received around **₹18,690 crore** in direct financial assistance. The funds were transferred through the **Direct Benefit Transfer (DBT)** system, ensuring transparency and eliminating intermediaries. The scheme is widely regarded as a significant initiative towards ensuring 'Annadata Samman'.

Recently, in July 2026, the Union Cabinet approved continuation of the PM-KISAN Scheme from **2026-27 to 2030-31**. A total financial outlay of **₹3.15 lakh crore** has been approved for the scheme during this period. The approval reiterates the government's commitment that the prosperity of farmers forms the foundation of the nation's prosperity.

Direct Income Support to Small and Marginal Farmers under PM-KISAN

PM-KISAN is a **centrally sponsored scheme** launched on **February 24, 2019**. The scheme seeks to provide assured income support to landholding farmer families nationwide with cultivable land. Under the scheme, each eligible farmer family receives **annual financial assistance** of **₹6,000**. This is disbursed in three equal instalments of ₹2,000 into their **Aadhaar-seeded bank accounts**.

The assistance provided under PM-KISAN has enabled farmers to make **timely investments** in seeds, fertilizers, irrigation, agricultural machinery and other agricultural requirements. This has **enhanced farmers' productive capacity**, **reduced their dependence on informal credit** and **strengthened the financial stability of rural households**.

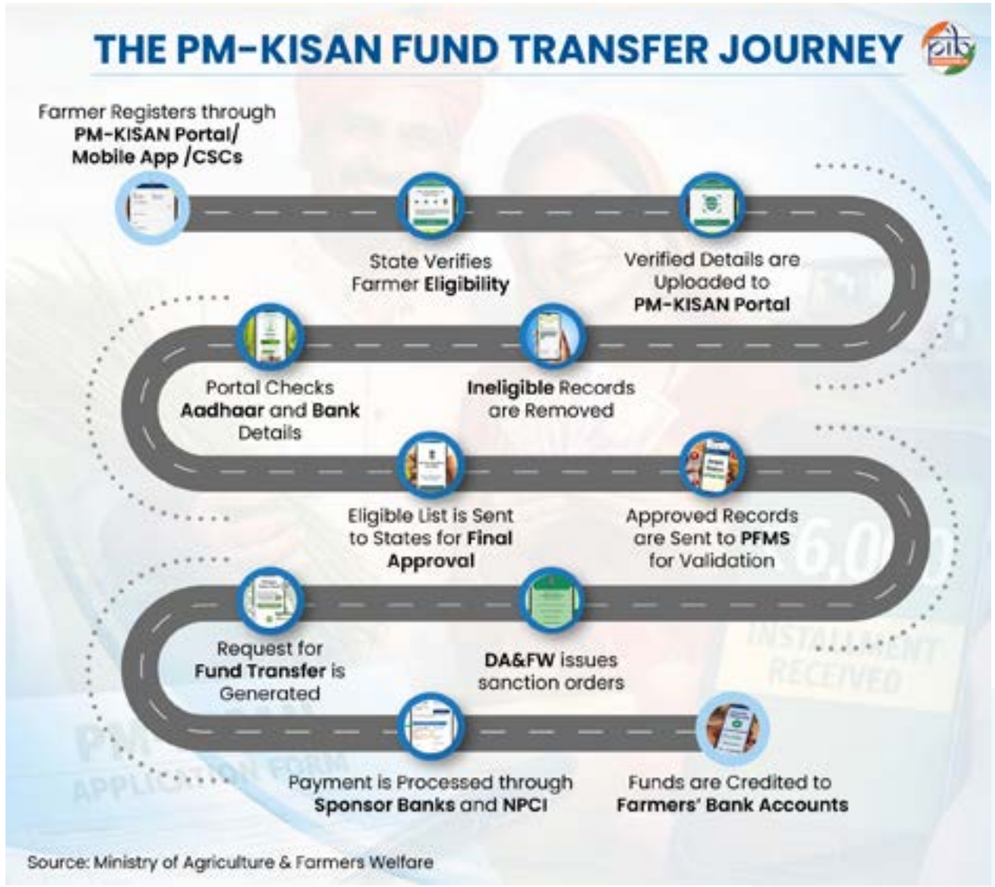
So far, more than **₹4.64 lakh crore** has been disbursed to **eligible farmer families** across the country through 24 instalments. The scheme benefits are provided to farmers after their land records are seeded on the PM-KISAN portal. They also must link their bank accounts to Aadhaar and complete e-KYC verification. Reflecting the government's continued commitment to strengthening farmers' income security, the **Union Budget 2026-27** has allocated **₹60,000 crore** for the PM-KISAN scheme.



The scheme seeks to **increase the income of small and marginal farmers** by providing financial support for agricultural inputs. This helps in **improving crop health and productivity**. Providing direct financial assistance also helps **reduce farmers' reliance on informal credit sources** and supports the continuity of agricultural activities. PM-KISAN stands out as one of the **largest Direct Benefit Transfer (DBT) initiatives globally**. This underscores its significant institutional mechanism for delivering financial support directly to farmers.

The PM-KISAN Fund Transfer Journey

The process begins with **farmer registration** through the PM-KISAN portal, mobile app, or Common Service Centres (CSCs). State governments **verify eligibility** and upload beneficiary details to the portal. The system then **validates Aadhaar and bank account details** and screens out ineligible applicants. After final state approval, the data is sent to the **Public Financial Management System (PFMS) for account verification.** Eligible records are used to **generate fund transfer requests** and payment orders. The Department of Agriculture and Farmers Welfare issues sanction orders. **Payments are then processed** through sponsor banks and the **National Payments Corporation of India (NPCI)**. Finally, funds are credited directly to farmers' bank accounts, ensuring fast, transparent, and efficient delivery of benefits.



Targeting, Beneficiary Identification, and Database Management

State Governments are responsible for **identifying eligible farmer households and developing a comprehensive beneficiary database**. This database includes key details such as name, age, category, Aadhaar number, bank account information, and mobile number. States ensure the **accuracy of these records** to prevent duplicate payments. These records are regularly updated, digitized, and linked to Aadhaar and bank account information to enable seamless DBT of benefits.

The lists of eligible beneficiaries are publicly displayed at the **village level** to **promote transparency**. This also enables farmers, who may have been inadvertently excluded, to seek inclusion through the appropriate grievance redressal mechanisms. Additionally, States and UTs conduct **recovery proceedings** for the benefits that have been **disbursed to ineligible individuals**. These include income tax payers, government employees, public sector undertaking (PSU) personnel, and holders of constitutional posts. As of December 2025, a total amount of **₹416.75 crore** has been recovered from ineligible beneficiaries nationwide.

Multi-Tier Monitoring and Grievance Redressal Framework

Monitoring of the PM-KISAN is undertaken through a **multi-tiered institutional framework** operating at the national, state, and district levels. At the national level, the review mechanism is chaired by the Cabinet Secretary. State and District Monitoring Committees supervise implementation within their respective jurisdictions.

Farmers can **register grievances** through the PM-KISAN portal and the **Centralized Public Grievance Redressal and Monitoring System (CPGRAMS)**. This facilitates timely resolution and transparent grievance management. During FY 2024–25, a total of **24,605 grievances** were recorded on the PM-KISAN portal.

Technology-Enabled Service Delivery System under PM-KISAN

PM-KISAN is supported by a **farmer-centric digital infrastructure** that streamlines access and enhances transparency in the delivery of benefits. Aadhaar-based authentication forms a key pillar of the system, facilitating secure beneficiary identification and payment verification. Farmers can complete e-KYC using:

- OTP-based authentication
- Biometric authentication
- Face authentication



The PM-KISAN **web portal** serves as the central digital platform for beneficiary registration, verification, and data management. It maintains a **unified national database** of farmers and facilitates fund transfers through integration with the **Public Financial Management System (PFMS)**. It also enables real-time monitoring of financial transactions nationwide. The portal further provides location-wise lists of beneficiary farmers, thereby enhancing transparency in programme implementation.

Complementing the portal, the **PM-KISAN mobile application**, launched in 2020, extends these services to mobile users. The application enables farmers to undertake self-registration, **track the status of benefit transfers**, and complete e-KYC verification. In 2023, the application was upgraded with a **Face Authentication feature**. This allows farmers to complete e-KYC by scanning their faces, thereby eliminating the need for OTP or fingerprint-based verification. Hence, this measure has been proven instrumental in improving accessibility of this scheme.

Artificial Intelligence (AI) Support System: Kisan-eMitra

In September 2023, the Government introduced Kisan-eMitra, an AI-enabled chatbot integrated with the PM-KISAN digital ecosystem. It was developed with technical support from the **EkStep Foundation** and **BHASHINI**. The chatbot provides farmers with **real-time information on payments**, **registrations**, and **eligibility** under the scheme in multiple Indian languages.

The platform offers 24/7 assistance in **11 major languages**: Hindi, English, Tamil, Bengali, Odia, Malayalam, Gujarati, Punjabi, Telugu, Marathi, and Kannada. Hence, this improves accessibility for a diverse user base. Through **voice- and text-based queries**, farmers can check the status of their applications, track payment updates, and obtain scheme-related information.

Building Agricultural Resilience through Sustained Income Support

PM-KISAN has emerged as a **key pillar of farmers' income security** through timely, direct financial assistance. The disbursement of the 24th instalment reinforces this commitment, reaching over 9.34 crore farmers with ₹18,690 crore. With cumulative disbursements exceeding ₹4.64 lakh crore, the scheme continues to **support agricultural investments** and **rural household stability**. Its **technology-enabled delivery system** promotes transparency, accountability, and wider access. The approved continuation until 2030-31 further underscores the **long-term commitment to farmer welfare**. By strengthening farmers' capacity to invest in agricultural inputs and sustain farming activities, PM-KISAN advances a broader vision of **inclusive agricultural development** and prosperity for India's farming community.

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PIB Research



17

Connecting Kashmir: Building the Infrastructure for Growth

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Jammu and Kashmir's challenging terrain is steadily yielding to a new era of connectivity. The Udhampur–Srinagar–Baramulla Rail Link has connected the valley to India's rail network. Its centrepiece, the Chenab Bridge, stands as the world's highest railway arch bridge. Expanded Vande Bharat services are improving passenger mobility. New freight terminals are carrying Kashmiri apples, saffron and handicrafts to national markets, opening opportunities for farmers and businesses. On land, the Sonamarg and Zojila tunnels promise year-round passage into Ladakh. In the air, Srinagar's expanding airport is complemented by nascent hubs at Udhampur and Kishtwar. Together, these advances are drawing Kashmir's produce, trade and tourism firmly into the national mainstream.

A Region Reconnected

Jammu and Kashmir's mountainous terrain has long made connectivity a major infrastructure challenge. Over the years, this has been steadily changing, with a wave of infrastructure investment reshaping how the region connects with the rest of the country. The Udhampur–Srinagar–Baramulla Rail Link (USBRL) project is a major part of this expansion. It is one of the most challenging railway line projects undertaken in the country post-independence. Today it stands as one of India's engineering marvels, linking the Kashmir Valley to the rest of the country by rail.

The USBRL project has also been accompanied by sustained expansion of roads, tunnels and airport infrastructure. The network now includes new train services such as the Vande Bharat Express. It also includes major road corridors and tunnels. Airport capacity is being expanded at Srinagar, with regional airports planned under UDAN, increasing passenger movement. Multimodal cargo terminals and enhanced freight services support goods movement across the region. These developments have progressively expanded all-weather connectivity infrastructure across Jammu and Kashmir.

Railways: Connecting Kashmir to the National Rail Network

Udhampur-Srinagar-Baramulla Rail Link (USBRL) National Project

The USBRL project was inaugurated in **June 2025**, improving connectivity infrastructure in the Himalayan region. Built at a cost of **₹43,780 crore**, the USBRL project covers the districts of **Udhampur**, **Reasi**, **Ramban**, **Srinagar**, **Anantnag**, **Pulwama**, **Budgam** and **Baramulla** of Jammu and Kashmir.

The project stretches **272 kilometres** through the rugged Himalayas; it includes **36 tunnels** that span 119 kilometres and **943 bridges**. Designed to overcome the region's challenging terrain, it connects remote areas with the national rail network. It is opening new opportunities for mobility, trade and tourism. As part of the USBRL project, over **215 km (including a tunnel and 320 bridges) of roads** have been constructed, which are useful for communities. Additionally, the **USBRL project** is fully electrified both in tunnels and in open stretches.

The USBRL project has made substantial socio-economic contributions to the region, with employment generation being a significant aspect of its impact. The project has generated more than 5 crore man-days of employment.

Vande Bharat Express

The Vande Bharat Express in Jammu and Kashmir first began operations in June 2025, between Katra and Srinagar. To further enhance railway connectivity, the Srinagar-Katra Vande Bharat Express service was extended to Jammu Tawi Railway Station in April 2026.

The distance from Jammu to Srinagar is now covered in less than **five hours**. The trains have been augmented from 8 to 20 coaches. They are specially designed to operate in extreme weather conditions. The trains are equipped with advanced operating systems and electronics suited for high-altitude conditions.



Image 1: Vande Bharat Express, Jammu and Kashmir

Supporting this route is a snow removal train that moves ahead to clear the tracks, ensuring year-round services. Seismic dampers have also been installed to absorb tremors, offering a safer and smoother journey in this high-risk zone.

Engineering Marvels under the USBRL Project

The USBRL project includes several major engineering achievements, including the Chenab Rail Bridge, Anji Khad Bridge and Tunnel T50.

Chenab Rail Bridge

Under the USBRL project, the **world's highest railway arch bridge** has been built over the Chenab River in the Reasi district of Jammu and Kashmir. The Chenab bridge, inaugurated in **June 2025**, is **1,315 m long**. It has an arch span of 467 metres and rises 359 metres above the riverbed, making it higher than the Eiffel Tower. The bridge is designed to withstand strong seismic and wind forces. With Vande Bharat services running over the bridge, connectivity has significantly improved between Jammu and Kashmir.



Image 2: Chenab Rail Bridge in Jammu and Kashmir

Anji Khad Bridge



Image 3: Anji Khad Bridge in Jammu and Kashmir

The Anji Khad bridge is India's **first cable-stayed railway bridge** built above the Anji River gorge, a tributary of the Chenab River. The Anji Khad bridge is part of the USBRL project and was inaugurated in **June 2025**.

The bridge is located in the **Reasi district** of Jammu and Kashmir. It is supported by a single 193-metre-high tower shaped like an **inverted 'Y'**, with cables supporting the bridge. The main bridge has a **total length of 473.25 metres**, designed for the region's challenging terrain and seismic conditions.

Tunnel T50



Image 4: Tunnel T50 in Jammu and Kashmir

Tunnel T50, inaugurated in 2024, is a **12.77-km rail** tunnel linking **Khari** and **Sumber** in Jammu and Kashmir. It is India's **longest transportation tunnel**, built under the USBRL project. The tunnel provides a vital rail link between the Kashmir Valley and the rest of India.

The New Austrian Tunnelling Method has been used to construct the tunnel through the challenging Himalayan geology. The tunnel engineering overcame the challenges of high-water ingress, landslides, shear zones, and jointed volcanic rocks. The tunnel features a main tube paired with a parallel escape tunnel, linked every 375 metres for safety. CCTV cameras are placed every 50 metres, which help monitor from a central control room.

Supporting Railway Infrastructure

Railway connectivity in Jammu and Kashmir is being strengthened through increased investment in supporting infrastructure and network development. The annual average budget of railways for Jammu and Kashmir has increased from ₹1,044 crore in 2009–14 to ₹1,086 crore in 2026–27.

Electrification

Indian Railways has pursued railway electrification in mission mode, with about 99.6% of the Broad Gauge (BG) network now electrified. **In Jammu and Kashmir, the entire existing BG network is electrified**. All new-line and multi-tracking projects are being sanctioned and built with electrification from the outset.

Station Redevelopment

Under the **Amrit Bharat Station Scheme, 1,340 stations** have been identified for redevelopment across Indian Railways. Among them, **four stations** are in **Jammu and Kashmir**. The stations are **Budgam**, **Jammu Tawi**, **Martyr Captain Tushar Mahajan (Udhampur)** and **Shri Mata Vaishno Devi Katra** station.

Other Regional Railway Initiatives

To strengthen railway connectivity in border areas and areas of strategic significance in Jammu and Kashmir, several projects are in the pipeline. These include

i) A **third line between Jalandhar Cantt. and Jammu Tawi (216 km)**.

ii) An **additional line between Jammu and Shri Mata Vaishno Devi Katra (78 km).**

iii) A **new railway line between Jammu/ Reasi and Poonch (190 km)**.

Roads: Strengthening Surface Connectivity

Roads as a complement to Rail

In Jammu and Kashmir, road infrastructure is expanding alongside railway infrastructure. Roads remain essential for last-mile access to places outside the railway network. In **August 2026**, foundation stones were laid for **110 road projects covering 598.455 km** under Pradhan Mantri Gram Sadak Yojana (PMGSY)-IV. Costing more than **₹1,500 crore**, the projects are expected to benefit **46,972 people** across the Udhampur–Kathua–Doda–Kishtwar region. The projects also include the **use of waste plastics** in several road packages, supporting more sustainable road construction.

Tunnel construction has also become a key component of development in the Himalayan region to ensure all-weather connectivity, improve road safety, and enhance strategic mobility.

Sonamarg (Z-Morh) Tunnel



Image 5: Sonamarg Tunnel, Jammu and Kashmir

The Sonamarg tunnel project, also known as the Z-Morh, inaugurated in January 2025, is a **6.4 km bi-directional tunnel with a parallel escape tunnel of length 6.4 km and an approach road of length 5.5km**. Constructed at a cost of over **₹2,700 crore**, the tunnel sits at an altitude of 2634 meters above sea level. The tunnel provides **all-weather connectivity** between Srinagar and Sonamarg enroute to Leh. It bypasses parts of the road hit by major avalanches and landslides. It promotes tourism by transforming Sonamarg into a year-round destination, boosting winter tourism, adventure sports and local livelihoods. Along with the Zojila Tunnel, **it will cut the NH-1 section of this project from 13 km to 11.98 km**.

Zojila Tunnel

The Zojila Tunnel is a 13.153-kilometre-long bi-directional tunnel being constructed between Baltal and Minamarg on National Highway-1 by NHIDCL. Elevated at 2,900–3,310 metres, the ₹6,808-crore project will provide all-weather year-round road connectivity between Jammu and Kashmir and Ladakh. With construction beginning in October 2020, the main tunnel achieved breakthrough in June 2026.

The tunnel will be equipped with modern ventilation systems, automatic fire detection and suppression systems, CCTV surveillance, a Variable Message Sign (VMS) system, SCADA system, and other advanced safety and traffic management systems. The project also includes **two twin tube uni-directional Nilgari tunnels of total length 4.8 km, eight cut-and-cover sections with a total length of 2.350 km, four bridges with a total length of 810 m, 40 culverts, snow galleries, catch dams, deflector dams, air-blast walls, and other avalanche protection structures along the approach road of length 16.964 km**.

Upon completion, the project is expected to reduce the travel time between **Sonamarg and Minamarg from approximately two hours to around 30 minutes**. The project will also reduce the risks of accidents and disruptions associated with the treacherous Zojila Pass, which remains vulnerable to **heavy snowfall and avalanches** during the winter months. The tunnel will boost tourism, trade, and access to remote and border areas. Year-round connectivity will strengthen defence logistics and strategic preparedness. It will also create employment opportunities, support economic growth, and improve livelihoods and quality of life for local communities.



Image 6: Zojila Tunnel, Jammu and Kashmir

Dr Syama Prasad Mookerjee Tunnel (earlier known as Chenani-Nashri Tunnel)

The 9 km tunnel, opened in **2017**, is **India's longest operating highway tunnel and Asia's longest bi-directional tunnel.** It connects Udhampur to Ramban in Jammu and Kashmir. Built at a cost of ₹2500 crore, it reduces travel distance by 31 km and cuts the travel time by two hours, saving fuel costs.

Expanding the Highway Network

- **Delhi–Amritsar–Katra Expressway:** The expressway is a 667-km greenfield highway connecting Delhi with Amritsar and Katra. It is designed to provide a faster road link, reduce congestion on NH-44, and improve access to major destinations, including the Shri Mata Vaishno Devi shrine. In **July 2026, key sections of the expressway were inaugurated**, marking a major step towards improving connectivity

between Delhi and Katra. The completed sections are expected to **reduce travel time between Delhi and Katra from about 14 hours to nearly six hours**. The corridor will also **strengthen connectivity for pilgrims and facilitate industrial and logistics activity along the route**.

- **Rafiabad–Kupwara Road (NH-701):** The foundation stone for the widening and strengthening of the Rafiabad–Kupwara section of NH-701 was laid in **June 2025** to strengthen last-mile connectivity, particularly in border areas. The project forms part of the **Rafiabad–Kupwara–Chowkibal–Tangdhar–Chamkot corridor** under Project Beacon.
- **Shopian Bypass (NH-444):** Sanctioned in March 2024 at a cost of ₹224.44 crore, the 8.925-km Shopian bypass had its foundation stone laid in June 2025. The bypass will improve connectivity between Shopian, Pulwama and Kulgam and facilitate faster transportation of agricultural produce.

Airports: Expanding Air Connectivity

Expansion of Srinagar International Airport

A ₹1,677 crore expansion of the Civil Enclave at Srinagar International Airport was approved in February 2026. The project is operated by the Airports Authority of India within Budgam Airbase of the Indian Air Force (IAF). It will strengthen aviation connectivity in the Kashmir Valley.

Spread over 73.18 acres, the development includes a new 71,500 square metre terminal building. The terminal will handle up to 2,900 passengers during peak hours and 10 million passengers annually. The airport will also have 15 aircraft parking bays, including space for one widebody aircraft. Its existing 3,658-metre runway will continue to be operated by the Indian Air Force. A new multi-level parking facility will also provide space for 1,000 cars. The project also includes barracks for security personnel.

The new terminal will combine modern airport facilities with elements of Kashmir's traditional architecture, including local woodwork and craftsmanship. Sustainability is a core part of the project. It includes water harvesting, greater use of natural light, and locally sourced eco-friendly materials. The project is targeted to achieve a 5-star Green Rating for Integrated Habitat Assessment (GRIHA) for sustainable building practices.

Extending Regional Air Connectivity

The Government is focusing on improving regional connectivity and providing affordable and secure travel options to residents of Jammu and Kashmir.

- Udhampur and Kishtwar reflect how regional aviation can extend access to areas beyond the region's major urban centres. The two airports are planned under the UDAN scheme to extend regional air connectivity in Jammu and Kashmir. Greater airport capacity is expected to support tourism, create employment, encourage investment and strengthen Srinagar's role as an economic destination.

From Connectivity to Economic Integration

Multimodal Logistics

PM Gati Shakti National Master Plan, launched in October 2021, brought railways, roads, ports, waterways, airports and logistics infrastructure onto a single, Geographic Information System (GIS) based planning platform. It spans 44 Central Ministries and 36 States and UTs. Building on this framework, the Gati Shakti Multi-Modal Cargo Terminal (GCT) policy, launched in December 2021, encourages the development of modern, rail-linked cargo terminals through private investment.

So far, 142 Gati Shakti Cargo Terminals have been commissioned in the country. In 2024, a Gati Shakti Multi-Modal Cargo Terminal (GCT) was commissioned in Samba in Jammu and Kashmir and is now fully operational. In addition, In-Principle Approvals have been granted for the development of GCTs at 310 more locations, including three at Kathua, Anantnag and Jammu districts in Jammu and Kashmir.

The GCT policy has benefited key sectors such as cement, steel, power, mining, agriculture, logistics and manufacturing. It has enabled modern multimodal cargo terminals with warehousing, silos, cold storage and other value-added logistics facilities. This has increased the competitiveness of local industries and farmers while generating employment and promoting regional economic development.

From Access to Opportunities

A region once defined by seasonal isolation is emerging as a connected part of India's economic geography. Rail, road and air projects are no longer separate initiatives; together, they now function as one integrated network. This convergence is reshaping daily life for residents, farmers, traders and tourism operators alike. The expansion is increasing the access of farmers and local businesses to markets beyond the region. Signature Kashmir products, including apples, dry fruits, pashmina shawls and handicrafts, are being sold at larger markets, promoting economic diversity. At the same time, improved

connectivity is strengthening the region's strategic position, including border security and disaster response.

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18

India’s Social Security Coverage

Strengthening Worker Protection

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India's social security framework has expanded through wider EPFO coverage, digital reforms and welfare initiatives. EPFO provides provident fund savings, pension and insurance benefits to eligible members. The increase in the mandatory coverage wage ceiling from ₹15,000 to ₹25,000 is expected to bring over 51 lakh additional employees within its ambit. Digital initiatives aim to simplify registration, withdrawals and claim settlement. Beyond EPFO, initiatives such as e-Shram, and schemes like PM-SYM and the Pradhan Mantri Samajik Sahayata Yojana extend support to unorganised workers and vulnerable groups. These measures strengthen access to social protection across employment categories and stages of life.

Social Security as a Pillar of Worker Protection

As economies evolve, employment patterns and sources of livelihood continue to change. The expansion of informal, gig and platform-based work, along with variations in income and employment continuity, makes social security increasingly important for workers and their families. Social security provides protection against income loss and other contingencies across different stages of life. It also strengthens financial security during retirement and periods of vulnerability.

India has significantly expanded the reach of social protection in recent years. **Social protection coverage increased from 19% in 2015 to 68.4% in 2026.** This expansion has brought more than one billion people within the social protection framework.

For Indian workers, social security provides financial security beyond their working years. The Employees' Provident Fund Organisation (EPFO) plays an important role by administering provident fund, pension and insurance schemes for eligible workers. It is a statutory body under the Ministry of Labour and Employment and **one of the world's largest social security institutions.** Its schemes help workers build retirement savings, access pension benefits and secure financial support for their families.

Three Pillars of EPFO-led Social Security

EPFO social security architecture includes provident fund savings, pension benefits and insurance protection.

- **Employees' Provident Funds Scheme, 2026 (EPF)**

The new EPF 2026 introduced under the Social Security Code, 2020 (Code) replaced the erstwhile Employees' Provident Fund Scheme, 2026. The EPF 2026 enables members to build retirement savings through contributions and accrued interest. It also permits partial withdrawals for specified purposes, including housing, higher education, marriage and medical treatment, subject to prescribed conditions.

- **Employees' Pension Scheme, 2026 (EPS)**

The new EPS 2026 under the Code replaced the erstwhile Employees' Pension Scheme, 1995. The EPS 2026 provides monthly pension benefits to eligible members on superannuation, retirement or disability. It also provides pension benefits to eligible dependents of deceased members, including spouses, children and other eligible family members.

- **Employees' Deposit Linked Insurance Scheme, 2026 (EDLI)**

The new EDLI 2026 under the Code replaced the erstwhile Employees' Deposit Linked Insurance Scheme, 1976 and provides insurance protection to eligible EPF members in the event of death while in service. The scheme offers insurance benefits of up to ₹7 lakh, without requiring members to pay a separate insurance premium.

Expanding EPFO Coverage Across the Workforce

Over the years, EPFO has expanded its reach alongside India's growing formal workforce. Its progress is reflected in wider membership, institutional coverage and pension support.

EPFO's contributing membership has increased significantly over the period. **Contributing members rose from 3.49 crore in 2014-15 to approximately 7.98 crore (as on 16 September, 2026).** This represents an increase of approximately **4.49 crore contributing members** over the period.

As of September 2026, **7.68 lakh establishments** are contributing to



EPFO. This provides a broad institutional base for extending social security coverage to eligible workers.

Pension support has expanded alongside membership. **EPFO paid pensions to 51.04 lakh pensioners during 2014-15.** Till September 2026, around **82 lakh pensioners** are receiving pension benefits. This represents an increase of over **31 lakh pensioners.**

The scale of social security benefits has also grown substantially. **1.30 crore claims were settled during 2014-15.** In the last one-year period (as of October, 2026), EPFO settled **6.42 crore claims.** This reflects the increasing scale of services delivered to EPFO members and beneficiaries.

Strengthening EPFO through Digital and Service Reforms

EPFO is strengthening social security delivery through wider coverage, simplified claim settlement and digitalisation. Reforms also focus on improving compliance, reducing administrative procedures and facilitating access to provident fund and pension services.



Wage Ceiling Revision

Extending Coverage: The wage ceiling for mandatory EPFO coverage was last revised in September 2014, from ₹6,500 to ₹15,000 per month. **In September 2026, a further increase to ₹25,000 per month was approved.** The revision is expected to extend mandatory coverage to over 51 lakh additional employees. It reflects changes in wage levels and the expansion of formal employment over the intervening period. The revised ceiling broadens the pool of employees eligible for mandatory coverage, subject to applicable statutory provisions.

Streamlining PF Withdrawals and Accelerating Claim Settlement

Simplified Partial Withdrawal Rules: EPFO has **consolidated 13 provisions governing partial withdrawals into three categories:** Essential Needs, Housing Needs and Special Circumstances. Essential Needs cover expenses related to illness, education and marriage. This categorisation simplifies the withdrawal framework, facilitating easier access to provident fund savings for eligible members.

Liberalised Withdrawal Limits: Employees can make partial withdrawals from their PF savings to meet specific financial needs during their working years. This allows them to access savings without withdrawing the entire accumulated balance.

EPFO has simplified these provisions by **allowing up to 10 withdrawals for education and 5 for marriage.** Earlier, both purposes shared a combined limit of 3 partial withdrawals. The revised framework, introduced in October 2025 also permits eligible members to withdraw up to 75% of their PF balance. This includes employee and employer contributions, subject to applicable conditions. The minimum service requirement has been standardised at 12 months.

Automated Claim Settlement: EPFO increased the auto-settlement limit for eligible advance claims to ₹5 lakh. This enables faster processing of eligible withdrawals without manual intervention.

Simplified Bank Verification: EPFO removed the requirement to upload cheque-leaf images or attested bank passbooks for eligible online claims. This reduces the paperwork and simplifies the claim process.

Strengthening Compliance and Ease of Doing Business

VISHWAS, 2026: The scheme facilitates **one-time settlement of eligible disputes involving damages or penalties** under the EPF & Miscellaneous Provisions Act, 1952, and the Code on Social Security, 2020. It reduces litigation and encourages voluntary compliance through a digital, time-bound process. The scheme covers cases involving challenged damage or penalty orders, pending or partial recovery, issued notices awaiting final orders, and cases where notices are yet to be issued.

- Eligible pre-14 June 2024 defaults attract reduced monthly damage rates of 0.25%, 0.50% or 1%, depending on the delay period.
- Employers must pay applicable statutory interest and undertake not to pursue further appeals on settled disputes.
- The scheme covers cases at different stages, subject to exclusions for fraud, misappropriation, deliberate falsification and fully recovered damages. Applications are submitted online through the EPFO Employer Portal.

AMNESTY, 2026: It is a one-time scheme launched by the EPFO to **help establishments regularise their provident fund PF trusts.** It covers trusts recognised under the Income Tax Act, 1961, but lacking formal exemption under the EPF & MP Act, 1952, or the Code on Social Security, 2020. The scheme is open until 28 December 2026.

- Eligible establishments can obtain exemption retrospectively, from the trust's establishment up to the prescribed cut-off date. The scheme also waives specified minimum employee strength and fund requirements.
- Eligible trusts must have deposited statutory contributions and credited interest to members' accounts at rates equal to or higher than the applicable EPF rate. Subject to these conditions, proceedings initiated solely because the formal exemption was missing will be withdrawn, and no new proceedings will be initiated on this ground.

Simplifying Registration with Digital Access

Automatic Registration: Since February 2020, eligible public and private limited companies and One Person Companies can avail the facility of automatic EPFO registration through the Ministry of Corporate Affairs portal. This facility operates through the **SPICe+ and AGILE-PRO forms.** This form combines various services like PAN/TAN/Director Identification Number/GSTN, etc.

Self-Generation of Universal Account Numbers (UAN): Since November 2019, workers have been able to generate their UAN independently. This facility supports enrolment in EPFO's social-security schemes. In April 2025, EPFO introduced **UAN generation and activation through Aadhaar-based Face Authentication Technology.** Available through the UMANG mobile application, this facility enables contactless and secure digital access. As of October 2026, **1.74 crore self-generated UAN** have been reported. In addition to this, **EPFO transactions on the Umang Application** since January



2017 till 21 October **are ~709 crore,** reflecting the scale of digital access to EPFO services.

Simplified Aadhaar Seeding: Since August 2025, EPFO members have been able to seed or correct Aadhaar details through the UAN Member Portal. Employers can approve requests directly when Aadhaar and UAN profile details match. Mismatched details can be referred online to the EPFO office for rectification. If the employer is unavailable, members can seek assistance through the concerned EPFO office's Public Relations Officer.

The UAN is a unique, permanent number assigned to an EPFO member, linking their provident fund accounts across different establishments. It facilitates the portability of provident fund accumulations when members change jobs, subject to verification of their details in the UAN database by the employer.

Digital Transformation of EPFO Services

Centralised Pension Payment System (CPPS): CPPS enables pension disbursement through any bank branch across India. Pensioners can receive their pensions without transferring Pension Payment Orders (PPOs) between offices when changing locations or bank branches. This benefits specially the pensioners who move to their hometown after retirement. In addition, the system also supports pensioners by reducing the need to visit the branch for any verification at the time of commencement of pension.

Doorstep Digital Life Certificate Services: EPFO has partnered with India Post Payments Bank (IPPB) to provide doorstep Digital Life Certificate services to EPS pensioners. EPFO bears the cost of ₹50 per certificate, making the service free for pensioners. The initiative particularly benefits elderly pensioners in rural and remote areas. It supports timely pension continuity, faster initiation of family pensions and improved accuracy under CPPS.

Redesigned EPFO Website: On 1 November 2025, EPFO launched its redesigned website at epfo.gov.in. The mobile-responsive portal provides a unified interface for employees, employers and pensioners. It offers easier access to passbooks, claim forms, pension services, profile updates and scheme information. Separate login options and the **"EPFO and You"** section help users locate services quickly. YouTube videos explain services such as checking PF balances, applying for advances, submitting pension applications, filing Electronic Challan-cum-Returns (ECR), registering establishments and activating UANs. The shorter domain and improved navigation simplify access across devices.

EPFO 3.0 - Core Banking-Based Transformation: EPFO 3.0 modernises services through industry-standard core banking capabilities.

- It integrates a core banking solution with cloud-native, API-first and microservices-based modules for account management, enterprise resource planning, compliance and customer services. Its phased implementation is designed to ensure secure, scalable and uninterrupted services.
- The initiative **reduces paperwork, accelerates claims and provides a unified platform for member services.**

- Risk-validated claims are designed for automatic processing without manual intervention, potentially reducing **settlement time from up to 20 days to under 3 days**.

- Planned capabilities include instant withdrawals, multilingual self-service and seamless payroll-linked contributions. The framework is intended to support EPFO's services for over 30 crore members.

Beyond EPFO: India's Wider Social-Security Framework

India's social security framework extends beyond EPFO through multiple schemes and institutional mechanisms supporting vulnerable groups and workers across employment categories. These initiatives combine social assistance, pension support, statutory protections and digital platforms to widen access to social security.

Pradhan Mantri Samajik Sahayata Yojana

The Yojana provides social assistance to **eligible elderly persons, widows, persons with disabilities and bereaved families.** It has been revised from the existing National Social Assistance Programme (NSAP) in October, 2026. **The scheme will continue from 2026–27 to 2030–31**. The following are the benefits offered by the sub-schemes under NSAP:

- The **disability pension scheme** provides monthly assistance of ₹375 to beneficiaries aged below 80 years and ₹625 to those aged 80 years and above. The benchmark disability threshold has been reduced from 80% to 40%, and the minimum age criterion has been removed, extending eligibility from birth.

- **The old age pension scheme** grants a monthly pension of ₹200 to persons aged 60-79 years and ₹500 to those aged 80 years and above.

- The **widow pension scheme** offers a monthly pension of ₹300 to widows aged 40-79 years and ₹500 to those aged 80 years and above.

- The **family benefit scheme** provides one-time financial assistance of ₹20,000 to eligible households upon the death of the primary breadwinner aged 18-59 years.

Code on Social Security, 2020

It **consolidates nine existing central labour laws relating to social security into a unified legislative framework.** The code provides for social security benefits covering provident fund, pension, insurance, maternity benefits, gratuity and other forms of worker protection. Its provisions extend to organised and unorganised workers, including gig and platform workers.

The Code provides for **gratuity to eligible fixed-term employees on a proportionate basis** after one year of service, subject to applicable conditions. It also recognises gig and platform workers within the social security framework and provides for schemes for their welfare, supported by a social security fund.

Women-centric provisions include **maternity benefits of up to 26 weeks for eligible women**, the option of work from home where the nature of work permits and crèche facilities in establishments meeting prescribed conditions. The Code also provides for digital and simplified compliance mechanisms to facilitate implementation and access to social security benefits.

e-Shram: An Integrated Platform for Unorganised Workers

Launched in August 2021, e-Shram created India's first **Aadhaar-seeded National Database of Unorganised Workers.** Each registered worker receives a UAN. The portal recorded 31.89 crore registrations as of August 2026. The e-Shram One-Stop Solution, launched in October 2024, integrates 15 social security and welfare schemes. It also connects workers with the National Career Service for jobs, Skill India Digital Hub for skilling and apprenticeship, and myScheme for identifying eligible government schemes.

Pradhan Mantri Shram Yogi Maandhan (PM-SYM)

PM-SYM is a voluntary and contributory pension scheme for eligible unorganised workers aged 18–40 years, with monthly incomes of up to ₹15,000. It provides a minimum assured pension of ₹3,000 per month after attaining 60 years of age, subject to prescribed conditions. Monthly contributions range from ₹55 to ₹200, depending on the age of enrolment, with an equal contribution from the Central Government. The scheme supports old-age income security for workers in the unorganised sector, which contributes around 50% of India's GDP.

Towards Universal Social Security

India's social security framework continues to expand through wider EPFO coverage, digital service delivery and reforms in labour welfare. Initiatives across provident fund, pensions, insurance and social assistance support workers across formal and informal employment. Simplified compliance and technology-enabled platforms are further strengthening access to benefits. Together, these measures contribute to a more inclusive and accessible social security system.

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PIB Research





Atal Vayo Abhyuday Yojana

Empowering India’s Silver Economy

Published on: 27 October 2026

Click here for Hindi

India is witnessing a steady rise in its elderly population, making healthy, secure and dignified ageing an important public policy priority. The Atal Vayo Abhyuday Yojana (AVYAY) provides an integrated framework that combines institutional care, healthcare, assistive devices, skill development, active ageing and technological interventions to improve the quality of life of senior citizens.

The Ageing Imperative

India is undergoing a quiet demographic shift. As per Census 2011, the total population of Senior Citizens (aged 60 and above) is **10.38 crores.** Out of this, population of males and females are 5.11 crore and 5.27 crore respectively. The Longitudinal Ageing Study in India (LASI), highlights that a substantial proportion of elderly individuals experience functional limitations. This underscores the growing need for structured and reliable care systems. At the same time, traditional family support for India's elderly is weakening due to increasing urbanization, migration, and the rise of nuclear households.

Launched in 2021, the Atal Vayo Abhyuday Yojana (AVYAY) subsumed and expanded the earlier National Action Plan for Senior Citizens (NAPSrC), bringing multiple senior citizen welfare interventions under a single umbrella scheme. The scheme aims to provide functional support and promote active ageing of senior citizens. It does so by providing shelter, food, healthcare, and recreational support. It also promotes active and productive ageing through capacity building of governments, NGOs, local bodies, and communities. The scheme reflects the Government's strong commitment towards "Ageing with Dignity" and "Ageing at Place". Ageing with dignity ensures senior citizens receive respectful, empowering care that honours their lifelong contributions. Ageing at place complements this by allowing seniors to remain in their own homes and communities safely, rather than relocating to assisted living. This is made possible by utilising adaptable home modifications and specialised community support systems.

What AVYAY Sets Out to Do

India's elderly population is projected to reach 23 crores by 2036, underscoring the growing need for a comprehensive support system for senior citizens. Through AVYAY, the Government seeks to address this demographic shift by strengthening institutional mechanisms



and promoting community-based support, enabling older persons to lead dignified, fulfilling and meaningful lives. Reflecting its continued commitment, the Government released **₹ 77.98 crores** as grant-in-aid to **755** projects ***under the Integrated Programme for Senior Citizens (IPSr.C) component of AVYAY*** *for the quarter ending 30 September 2026 during the financial year 2026–27.*

Institutional Architecture of AVYAY

The Institutional Architecture of AVYAY is as follows:

1. Nodal Ministry

- **Ministry of Social Justice and Empowerment (MoSJE)** is the nodal ministry responsible for policy formulation, funding, monitoring, and overall implementation of AVYAY through the Department of Social Justice and Empowerment.

2. State and UT Governments

- Under the **State Action Plan for Senior Citizens (SAPSrC)** component, States and UTs prepare and implement state-specific action plans for senior citizen welfare.
- The Ministry provides financial support for formulation and implementation of these plans.

3. District-Level Committees: While the Centre and States are the broad architects, the actual selection of indigent beneficiaries and the on-the-ground monitoring of the homes are handled by **District Committees chaired by the District Collector/Magistrate.**

Building Blocks of AVYAY

Monitoring, Evaluation and Accountability

The monitoring, evaluation, and accountability framework under the Atal Vayo Abhyuday Yojana (AVYAY) is designed to ensure transparency, efficiency, and outcome-based implementation across all components of the scheme.

- Project Monitoring Unit (PMU) conducts periodic field inspections to verify the authenticity and proper functioning of projects under Integrated Programme for Senior Citizens (IPSrC).
- Implementing NGOs need to submit:
  - » Periodic progress reports
  - » Utilisation Certificates (UCs)
  - » Audited financial statements
- Projects are monitored via the **E-anudaan portal**, and implementing agencies are required to use **cloud-based contactless biometric attendance systems** mapped to the residents.
- Furthermore, institutions must provide **live CCTV feeds** on their websites or the portal to ensure transparency.

The Atal Vayo Abhyuday Yojana (AVYAY) operates through a set of integrated components designed to address the diverse needs of senior citizens.

Integrated Programme for Senior Citizens (IPSrC)

The **IPSrC** serves as the primary implementation arm, providing grants-in-aid directly to Non-Governmental Organizations (NGOs), Panchayati Raj Institutions, and local bodies to run and maintain old age homes, continuous care homes, mobile medical units, physiotherapy clinics, and regional resource and training centres. At present, **764 Senior Citizen Homes, 13 Continuous Care Homes, 17 Mobile Medicare Units** and **3 Physiotherapy Clinics** are being supported under IPSrC. Here, MMUs and Physiotherapy Clinics represent ongoing projects, as the scheme's current expansion focus is primarily on establishing and maintaining Senior Citizen Homes to ensure shelter for indigent seniors. Funds are released to eligible organisations, including NGOs, State Governments, and local bodies, for the establishment and maintenance of these facilities through a grant-in-aid model.

State Action Plan for Senior Citizens (SAPSrC)

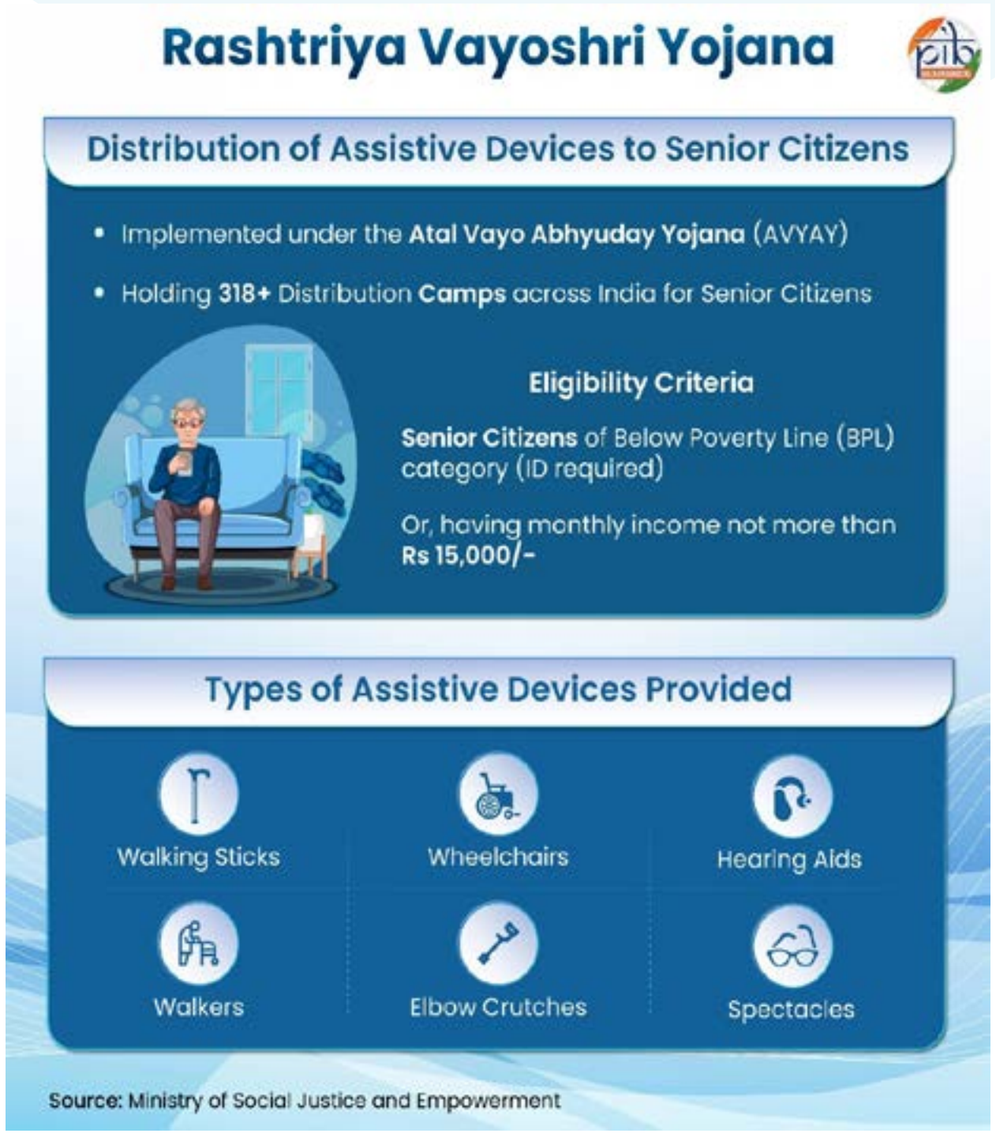
It focuses on **state-level strategy and capacity building.** It provides grants to State and Union Territory governments to create a pool of trained geriatric caregivers, conduct special cataract surgery drives, and implement other state-specific welfare initiatives. To foster local innovation, States can utilize up to **20%** of their allocated funds for these state-specific programs. While States/UTs may incorporate their own strategies and programmes, funding is admissible only for components approved under AVYAY. States/ UTs are also expected to put in their own funds to augment the resources available for this purpose.

Regional Resource and Training Centres (RRTCs)

Regional Resource and Training Centres (RRTCs) serve as key institutional support structures under AVYAY, particularly the Integrated Programme for Senior Citizens (IPSrC). Designated by the Government, these centres function as regional nodal agencies for capacity building, training, research, documentation, awareness generation and advocacy on issues relating to ageing and elderly welfare. They support evidence-based policy and programme implementation through database development, monitoring and evaluation, project inspections, and coordination with State Governments, Union Territories and implementing organisations. As per the Scheme guidelines, an annual financial support of Rs. 19.58 lakh is given to each RRTC. Additionally, the Ministry provides financial assistance to designated NGOs and institutions serving as RRTCs to strengthen outreach, capacity building and service delivery for senior citizens.

Rashtriya Vayoshri Yojana (RVY)

Rashtriya Vayoshri Yojana (RVY), originally **launched in 2017 as a standalone central sector scheme,** has been subsumed under the AVYAY as one of its key components. Under this, eligible senior citizens suffering from age-related disability or infirmity are being provided assistive living devices to restore near normalcy in bodily functions. As of date, the scheme has achieved massive scale, cumulatively benefiting **over 10.45 lakh senior citizens** covered with **5587653 Assistive Living Devices** through camp mode and walk-in centres of the Artificial Limbs Manufacturing Corporation of India (ALIMCO) at Pradhan Mantri Divyasha Vayoshri Kendras (PMD-VK).



National Helpline for Senior Citizens

The Government has also established a National Helpline for Senior Citizens, called **Elderline (Helpline Number: 14567)**, launched in October 2021. It connects senior citizens to timely support and provides free information, guidance and emotional support. Serving as a single, accessible platform, it redresses grievances of all kinds, with the service coordinating directly with district authorities and NGOs to resolve issues on the ground. Field intervention is also provided wherever senior citizens need it most. Demonstrating its massive reach Elderline has received over **8.66 lakh actionable calls, covering various categories, including information, guidance, emotional support, field intervention and other services.**

JEEVAN App and SHATAYU Dashboard

In May 2026, the Government launched the **Joint Elderly Empowerment and Virtual Assistance Network (JEEVAN)** mobile application and the **Senior**



Holistic Care Assistance and Training for Your Utility (SHATAYU) geriatric dashboard.

The app offers a range of features tailored to the needs of senior citizens, including information on government schemes and welfare programmes, access to emergency assistance and support services, and details of senior citizen homes. Designed with elderly users in mind, the platform features a user-friendly interface, simple navigation, and enhanced accessibility options. Crucially, it includes a **"one-tab call"** facility that allows users to directly call important numbers with a single tap, providing immediate guidance and support during medical requirements or emergencies.

The **SHATAYU** dashboard **helps senior citizens and families find trained geriatric caregivers**. It shows caregiver availability by district and State and strengthens India's organised care economy. It also connects trained geriatric caregivers with senior citizens in need of care. To strengthen the database, caregivers trained during 2023–24 and earlier were invited to self-register, enabling more senior citizens to access trained caregiving services. As per the dashboard, the total number of caregivers is 30,151, amongst them 6,817 are male, 23,334 are female.

Seniorcare Ageing Growth Engine (SAGE)

This initiative aims to encourage young entrepreneurs to identify and address the challenges faced by the elderly through innovative solutions. It also seeks to support the development of these ideas into start-ups by providing equity support. Focusing on building a robust **"Silver Economy,"** SAGE supports both the development of novel ideas into start-ups and the expansion of existing start-ups already functioning in the elderly care segment. These enterprises develop products, services, and technological solutions tailored to the needs of senior citizens. Under SAGE, selected start-ups are given financial assistance up to **₹1 crore through equity participation.** Besides that, they are also provided mentoring and market linkages to scale solutions that enhance the quality of life for the elderly.

Through equity support and the SAGE Portal, the Government facilitates access to credible elderly-care solutions while promoting the Silver Economy.

Anubhav Bolta Hai

Anubhav Bolta is an awareness and knowledge-sharing initiative under the broader Atal Vayo Abhyuday Yojana's framework. Through the Senior Citizens Portal, it provides a platform for senior citizens to share experiences, success stories, and life lessons, treating their motivation as a vital resource for all to learn and connect. Expanding its reach, 'Anubhav Bolta' is also a dedicated knowledge-sharing section within the newly launched JEEVAN mobile application. On the app, it features articles designed to keep senior citizens informed about issues related to ageing, healthy living, legal rights, and welfare schemes, making it both a service-oriented platform and a source of active awareness.

Senior Citizen Opportunities for Productive Engagement (SCOPE)

The Senior Citizen Opportunities for Productive Engagement (SCOPE)

SAGE Portal

It is a dedicated digital platform that acts as a single-window interface for identifying, verifying, and aggregating elderly care solutions. The portal enables senior citizens, caregivers, and stakeholders to access a curated range of products and services. Additionally, it also serves as a bridge between innovative start-ups and end users, thereby strengthening the overall ecosystem of senior care in India.

Registration on the SAGE Portal: Entrepreneurs and start-ups working in the elderly-care ecosystem can register and create login credentials on the SAGE Portal by providing company details, website/app information, email ID, mobile number etc. Once an application is submitted, it undergoes a preliminary evaluation and a detailed due diligence process carried out by IFCI Venture before final approval. Simultaneously, the portal acts as a facilitator for senior citizens, providing them with an accessible platform to easily identify and connect with these verified elderly-care service providers.

empowers elders through active community participation and livelihood opportunities. Many senior citizens possess the experience, time, and energy that can be highly valuable to business enterprises looking for stable, experienced employees. Recognizing that the human resources cells of many private enterprises actively seek such experienced individuals for certain positions, the portal acts as a bridge by allowing the virtual matching of preferences. By **connecting these experienced senior citizens with meaningful roles, the initiative promotes productive ageing** and transforms them into active, independent contributors to India's evolving socio-economic landscape.

PM-SPECIAL (System for Provision of Eldercare in House and Assisted Living) Training of Geriatric Caregivers

The initiative focuses on strengthening the ecosystem of geriatric care in India. The main objective is to **bridge the gap in supply and increasing demand in the field of geriatric caregivers.** The goal is to provide more professional services to senior citizens, and also to create a cadre of professional care givers in the field of geriatrics. Additionally, it provides free skill-based training to individuals in geriatric care roles. The training is delivered through empanelled institutes following standard norms set by the Government.

Towards Dignified Ageing

Beyond its components, AVYAY is complemented by initiatives that connect senior citizens with younger generations. On 1 September 2026, the Department of Social Justice and Empowerment signed a Memorandum of Understanding with Ramakrishna Math and Ramakrishna Mission to implement 'Creating Intergenerational Bonding'. The nationwide initiative seeks to strengthen emotional and cultural bonds among children, parents and grandparents through play-based and evidence-informed activities delivered through the school system. Under the collaboration, a scalable design and implementation model will be developed and introduced across 200 pilot schools, with Co-Learning Games, a bilingual Resource Centre website and teacher certification. The initiative is expected to complement the Ministry's senior citizen welfare initiatives, including AVYAY and the Elder Line helpline, and will give senior citizens opportunities to pass on their wisdom and values while helping children remain rooted in culture. Ramakrishna Math and Ramakrishna Mission will serve as the implementing partner, supported by a Knowledge Development Partner for research, design and assessment.

The Atal Vayo Abhyuday Yojana represents a comprehensive and evolving framework for addressing the multifaceted needs of India's ageing population. The scheme focuses on strengthening long-term care infrastructure, assisted living facilities and support systems for the elderly. This reflects a shift towards a more coordinated and lifecycle-based approach towards India's senior citizens. Through its collaborative model involving central and state governments, NGOs, and specialised institutions, AVYAY is positioned as a critical pillar of India's social protection architecture.

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Agri-Voltaics

Powering India’s Farms, Growing a Sustainable Future

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Click here for Hindi

At the intersection of agriculture and renewable energy lies an innovative approach to making farmland more productive. Agrivoltaics combines crop cultivation with solar power generation on the same land, enabling farmers to diversify their incomes while contributing to India's clean energy transition. By bringing food production and solar electricity together, it offers a promising pathway towards efficient land use, greater farm resilience and sustainable rural prosperity.

Solar Power for Agri Farms and a Cleaner Future

Agriculture plays a vital role in India's economy, serving as a key source of livelihood for approximately 46.1 per cent of the population. The Gross Value Added (GVA) of the Agriculture and Allied Sector is estimated to reach **Rs. 52.08 lakh crore in 2025-26.** Sustaining this vital sector requires reliable and affordable energy for irrigation and other farming operations. Solar power can help meet these everyday needs while advancing India's clean energy transition. *Click to Read More: The New Era of Indian Agriculture and Allied Sectors*

India's vast agricultural land offers significant prospects to integrate solar energy with farming. According to **Land Use Statistics for 2023-24,** the country's reported area covers **306.96 million hectares,** of which approximately 55 per cent is agricultural land. The net sown area stands at 138.99 million hectares, while the **gross cropped area covers 217.88 million hectares.** This extensive land base offers opportunities to generate solar electricity alongside agricultural production. Farmers can use solar power to operate **irrigation pumps, reduce dependence on conventional electricity and potentially supplementary revenue** by supplying surplus electricity to the grid. For instance, solar-powered irrigation pumps can provide daytime power for watering crops while reducing reliance on diesel-powered alternatives.



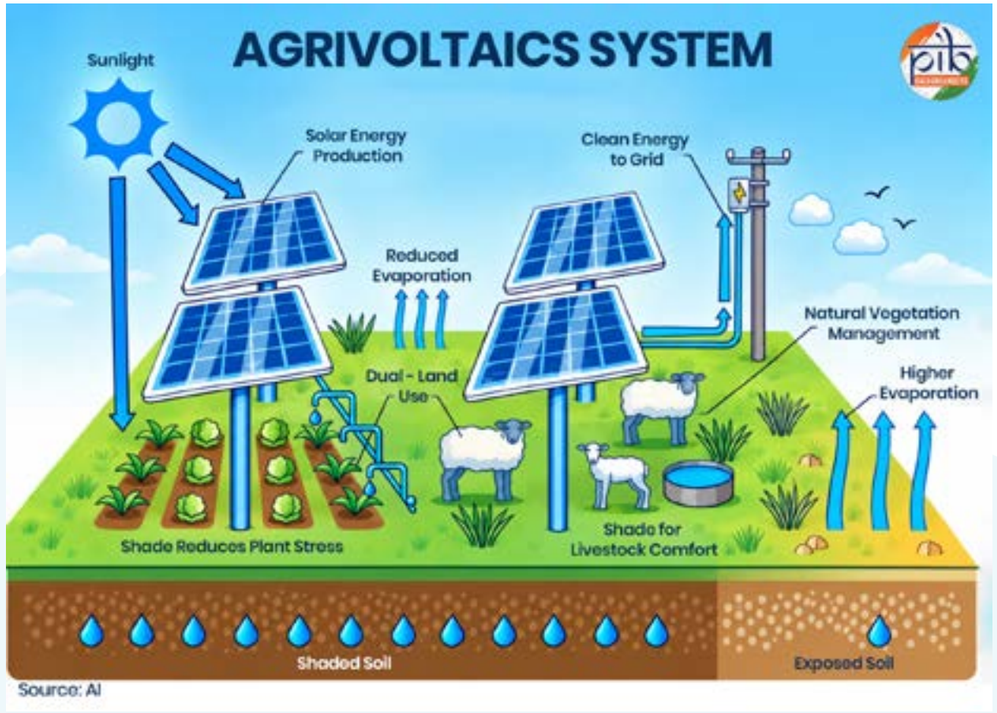
Agrivoltaics takes this integration further by bringing together crop cultivation and solar electricity generation on the same land. Solar panels installed above or between crop rows allow electricity generation alongside continued farming. Depending on the crop, panel design and local conditions, partial shading may also help reduce soil moisture loss. This approach can improve land-use efficiency, diversify farm earnings and strengthening both food and energy security. Through research, field demonstrations and policy development, India is exploring ways to adapt agrivoltaics to diverse agricultural conditions. It offers a promising pathway to align farmers' livelihoods with India's wider renewable energy ambitions.

Agrivoltaics: Bridging Agriculture and Renewable Energy

Agrivoltaics, also known as **agrisolar** or **dual-use solar,** maximises land-use efficiency, provides shade for crops and creates additional benefits for farmers.

Design and Functioning of Agrivoltaic Systems

An agrivoltaic system integrates agricultural infrastructure with solar installations, adapted to local farming conditions. The technology operates through various key elements:



Source: AI

- **Elevated Solar Structures:** Instead of placing solar panels directly on the ground, they are mounted on structures high enough to let sunlight and rain reach the crops below. These elevated solar panels for agriculture also allow farmers to move their equipment underneath without any trouble.
- **Partial shading:** The panels provide shade, which helps protect crops from extreme heat and reduces water evaporation from the soil. This creates a cooler, more stable environment for plants to grow, especially in hot or dry regions.
- **Dual Land Productivity:** Agrivoltaics optimises land use by integrating crop cultivation or livestock rearing with solar power generation, supplying electricity for farm activities and creating an additional revenue stream through surplus power sales to the grid.

Agrivoltaics Development in India

As of August 2025, India had **36 operational agrivoltaics projects** with an **installed capacity of 37.54 megawatts, alongside 10 pilot projects under development.** These Projects span diverse agroclimatic regions and include elevated structures, interspace layouts and tracking systems, reflecting India's evolving approach to integrating solar power generation with agricultural production.



India's Agrivoltaic Potential

India holds significant potential for agrivoltaics. Estimates place the country's agrivoltaic potential between **3,000 GW and nearly 14,000 GW,** highlighting the scale of opportunity at the intersection of agriculture and renewable energy. Agrivoltaic systems can also create profits diversification for farmers. In some cases, annual earnings could rise from around **₹60,000 per acre to over ₹1 lakh per acre.**



Scope for Agrivoltaics Developments

- **Land Suitability:** The GIS-based national screening identified 47.35 million hectares of "restricted cropland" suitable for AgriPV after applying environmental, agronomic, and technical filters, reflecting a conservative, climate-resilient land base.
- **CropCompatibility:** Fruits, vegetables, spices and medicinal plants offer promising options for cultivation alongside solar installations.
- **High-potential states** include Maharashtra, Rajasthan, Andhra Pradesh, Madhya Pradesh, Karnataka and Uttar Pradesh, which collectively account for nearly 50 per cent of India's estimated AgriPV power generation potential, driven by favourable combination of cropland availability, solar resource, and agro-climatic conditions.
- **Moderate potential** is observed in Odisha, Tamil Nadu, Kerala, Telangana, Bihar, and West Bengal.
- The southern, western, and central regions exhibit the most favourable combination of solar irradiance, land availability, and horticultural intensity for large-scale deployment.

Government Initiatives in Agrivoltaics Development

The Government of India has undertaken a range of policy, research, technology development, and implementation measures to advance agrivoltaics adoption and expansion across the country.

- **Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM KUSUM):** Launched in February 2019, the scheme encourages solar energy adoption in agriculture, reduces dependence on diesel and creates opportunities for farmers to diversify their earnings. It envisages central financial assistance of approximately ₹34,422 crore. It also enables decentralised solar power generation and solarisation of agricultural pumps, creating avenues of development for solar energy integration with farming. *PM KUSUM Scheme*
- **Centre of Excellence on Agrivoltaics:** The National Institute of Solar Energy, in collaboration with the Indian Council of Agricultural Research's Indian Agricultural Research Institute, has established a CoE for agrivoltaics research, demonstration and capacity building. It has undertaken pilot projects, including a 100-kilowatt agrivoltaic system at the Indian Agricultural Research Institute.

India Agrivoltaics Alliance

The **India Agrivoltaics Alliance (IAA),** anchored by the National Solar Energy Federation of India (NSEFI), is a multi-stakeholder platform advancing the dual use of land for solar energy generation and agriculture. Launched in 2023, the Alliance has grown to over 40 members and works with government ministries and industry stakeholders to advance agrivoltaics through policy advocacy, research and on-the-ground implementation. It develops knowledge resources, promotes pilot projects and supports scalable business models to improve land productivity, diversify farmer incomes and strengthen rural energy access.

State-specific Initiatives

Several states are facilitating solar energy in agriculture through region-specific schemes.

- **Mukhyamantri Saur Krushi Vahini Yojana 2.0, Maharashtra:** The scheme drives solar power generation through 16,000 megawatts of solar projects across approximately 35,000 acres of government and private land to support electricity supply to agricultural consumers.
- **Kisan Suryoday Yojana, Gujarat:** Expands solar energy utilisation to meet farmers' electricity needs by providing daytime power supply for agricultural activities, with a planned supply window of up to 16 hours daily, from 5:00 AM to 9:00 PM, through the phased commissioning of solar and other non-conventional energy generation plants.
- **Surya Raitha Scheme, Karnataka:** The scheme advances solar-powered irrigation pumps and allows farmers to earn from surplus electricity. Solar pumps can help farmers access energy for watering their crops while reducing dependence on diesel-powered pumps.

The Government of India, alongside state governments, is advancing the use of solar energy in agriculture through policy measures and targeted programmes. These efforts are shaping India's agrivoltaics landscape by creating opportunities for the co-location of solar power generation and agricultural production.

Powering Prosperity Through the Convergence of Farms and Clean Energy

Agrivoltaics offers India an opportunity to strengthen agricultural livelihoods while advancing environmental sustainability. By combining food production with renewable energy generation, it can offer scope for more efficient land use, conserve water under suitable conditions and create greater financial resilience. The Government of India's initiatives, including PM-KUSUM and proposed measures to expand agrivoltaics, reflect efforts to connect rural development with clean energy goals. As implementation grows, locally suitable designs, scientific research and farmer participation will be essential to balance agricultural productivity with energy needs. This approach can contribute to a more resilient and sustainable future for India. Greater financial resilience.

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PIB Research





21

India’s Nutrient-Rich Purple Potato

Kufri Jamunia: Integrating Nutrition into one of India’s Most Common Staple Crops

Published on: 18 October 2026

Click here for Hindi

Hidden hunger remains a major nutritional challenge despite adequate calorie intake in many populations. ***Biofortified crops*** *are being developed to improve the intake of essential vitamins and minerals through daily food consumption. In this context,* ***ICAR-CPRI*** *(Indian Council of Agricultural Research- Central Potato Research Institute) developed nutrient-rich coloured potato varieties, including* ***Kufri neelkanth, Kufri manik,*** *and* ***Kufri jamunia.*** *These varieties contain important* ***antioxidants*** *and* ***micronutrients,*** *such as anthocyanins, iron, and zinc. Among them, Kufri jamunia represents a major advancement due to its higher levels of Vitamin C, anthocyanins, and carotenoids. Its improved nutritional profile, attractive purple flesh, and strong consumer appeal make it an important variety for addressing hidden hunger and improving nutritional security.*

Potatoes Beyond Calories: Addressing Hidden Hunger

Hidden hunger remains a major public health challenge despite adequate calorie intake. It occurs when people consume sufficient food but lack essential vitamins and minerals in their diet. To address this challenge, scientists are increasingly developing **biofortified crops** with enhanced nutritional value. Biofortification **improves the nutrient content** of crops through plant breeding, enabling food to naturally provide higher levels of essential nutrients. Unlike conventional food fortification, which adds nutrients during processing, biofortification **integrates nutrition directly into the crop.** This makes it a sustainable and cost-effective approach to improving nutritional quality in commonly consumed foods. It also strengthens **long-term nutritional security.**

One important outcome of biofortification research has been the development of **coloured potato** varieties with enhanced nutritional value. These include **red, purple,** and **blue**-fleshed potatoes. These potatoes contain **natural pigments,** such as anthocyanins and carotenoids, which give them their distinctive colours. Coloured potatoes are rich in **antioxidants** and micronutrients such as **iron** and **zinc.**

Nutrient-Rich Coloured Potato Varieties Developed by ICAR-CPRI

ICAR-CPRI (Indian Council of Agricultural Research- Central Potato Research Institute) has developed the following nutrient-rich coloured potato varieties:

- *Kufri neelkanth* was the first purple-skinned specialty potato variety developed by ICAR-CPRI (Central Potato Research Institute), released in **2018.** The variety is suitable for cultivation in **Punjab, Haryana, Uttar Pradesh, Uttarakhand, Bihar, Madhya Pradesh,** and **Chhattisgarh.** It is known for its high antioxidant content. The variety is suitable for people of all age groups.

- *Kufri manik* was released in **2021.** It produces attractive, deep red tubers with a round shape, medium eyes, and yellow flesh. The variety is rich in nutrients and contains high levels of anthocyanin, zinc, and iron.

- ***Kufri jamunia*** was officially released in **2024.** The variety contains **higher levels of ascorbic acid, anthocyanin, and carotenoids** than Kufri manik and Kufri neelkanth. Its purple flesh indicates high antioxidant content and better nutritional quality. Kufri jamunia also contains **enhanced levels of zinc and iron.** The variety is suitable for table purposes and adds novelty to different food preparations due to its unique purple colour. Hence, this variety is observed to have very high consumer appeal.

Kufri jamunia: A Biofortified Purple Potato for Nutritional Security

Kufri jamunia is a medium-maturing potato variety with medium-tall plants and a semi-compact canopy. The tubers are dark purple on the skin and purple in the flesh. They are oblong, with shallow eyes and a mealy texture. Each plant produces 10–12 medium to large tubers.

Salient characteristics of Kufri jamunia are:

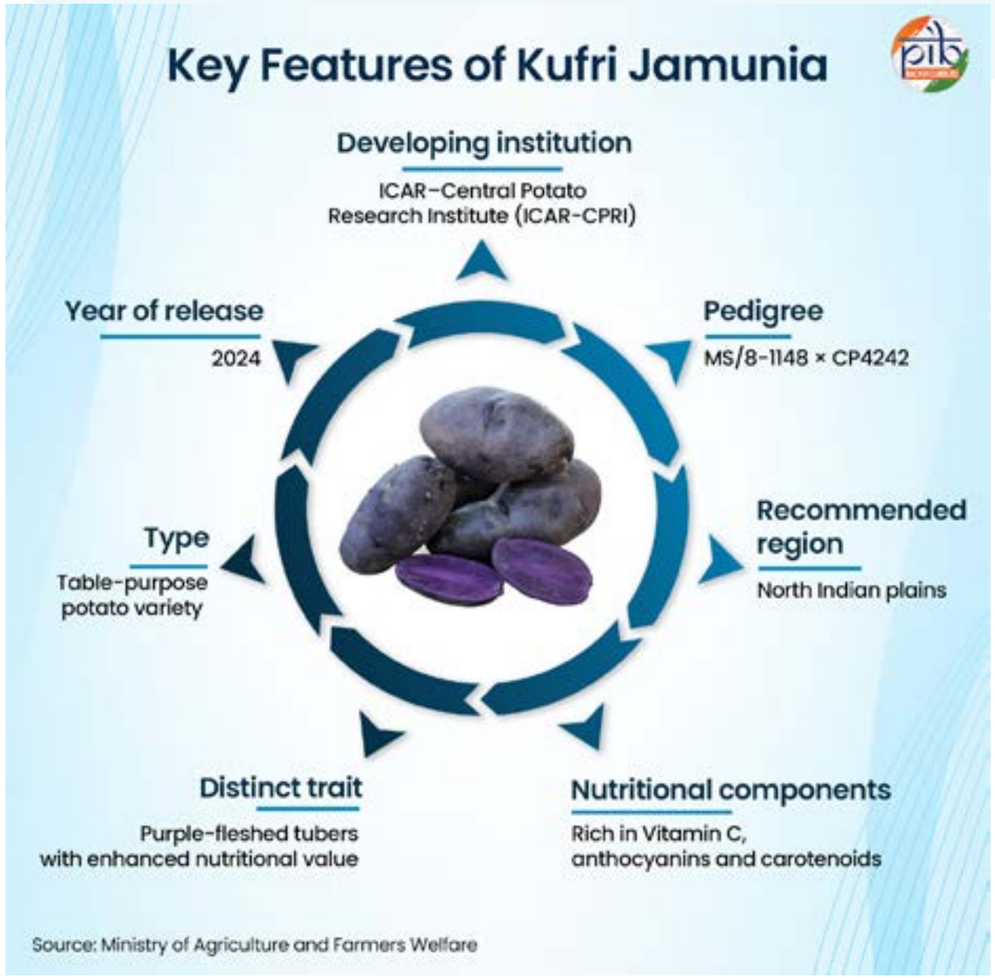
• Produces **32-35 tonnes per hectare** under recommended cultivation practices.

• Recorded around **49 tonnes per hectare yield** in station trials at 90 days duration.

• Marketable yield reached nearly **90%** of total production in trials.

• Shows **medium dormancy** of around 6-8 weeks. Hence, tubers do not sprout quickly.

• Possesses good storage quality with **low rottage** and **minimal weight loss.**



Key Nutritional Components in *Kufri Jamunia*

Kufri jamunia contains 42.05 mg/100 g of anthocyanins in flesh and 80.66 mg/100 g in skin. It also contains around 42.75 mg/100 g of **Vitamin C** in the flesh. The **carotenoid** content is around 161 µg/100 g fresh weight in flesh. In addition, the variety contains about 22.77 ppm zinc and 32.23 ppm iron in the flesh. The following table compares the nutritional value of Kufri jamunia with conventional yellow-skinned potato:

Nutrient (per 100 gm)	Kufri Jamunia	Common Potato
Vitamin C	42.75 mg	23.15 mg
Zinc	2.28 mg	0.28 mg
Iron	3.22 mg	0.57 mg

Culinary Uses of *Kufri jamunia*

Apart from its nutritional advantages, Kufri jamunia is suitable for a wide range of culinary applications. The variety is valued for its **attractive purple colour, mealy texture, and pleasant flavour.** This makes it suitable for both traditional preparations and processed food products. Its distinctive pigmentation also enhances the visual appeal of dishes and processed foods.

Purple-fleshed potatoes such as Kufri jamunia can be used in several preparations, including:

- **Traditional dishes:** vegetable curry, paratha, puri, and raita
- **Breakfast and snack preparations:** daliya, halwa, upma, dosa, and idli batter
- **Processed products:** potato flour for bakery items, soups, and cookies

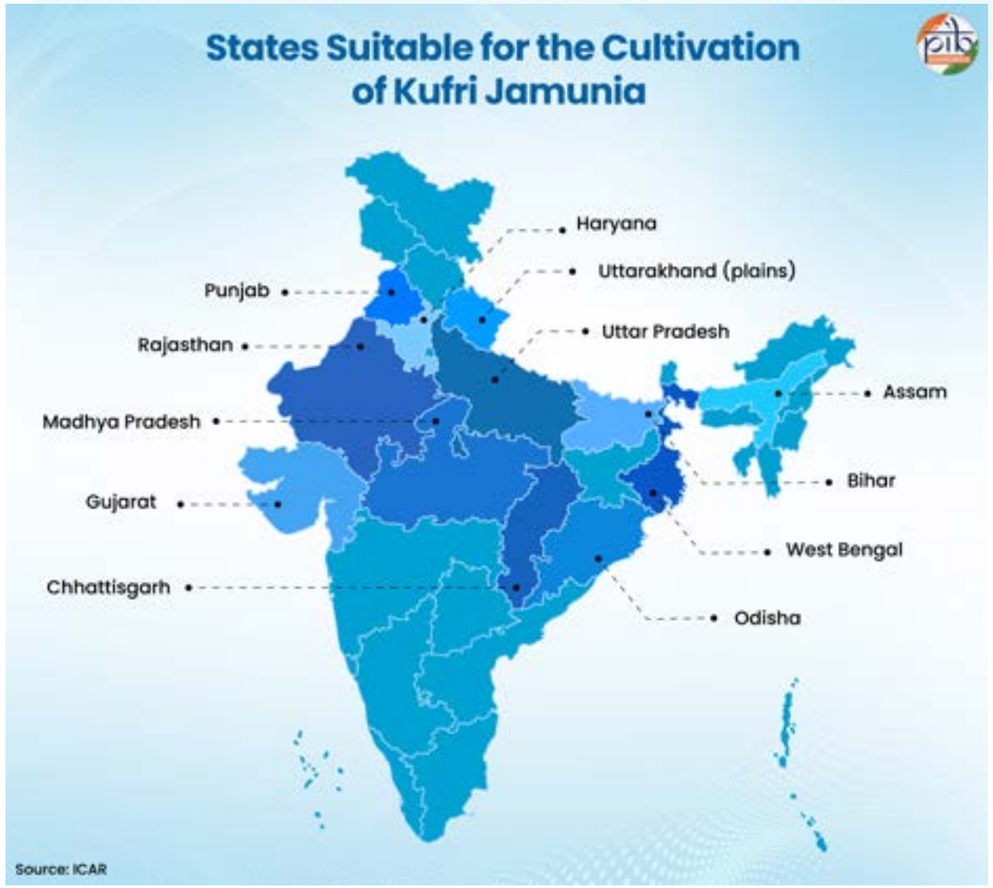
In addition, the tubers can be processed into **dehydrated products** such as **anthocyanin-rich daliya, suji, and flour,** which can be used as ingredients in various food formulations.

States Suitable for *Kufri jamunia* Cultivation

For large-scale adoption, a crop variety must perform reliably across different agro-climatic conditions. ***Kufri jamunia*** has demonstrated stable performance in multi-location trials and has been recommended for cultivation in the **North Indian plains.** The variety is considered suitable for several states where potatoes are widely grown.

These regions provide **favourable climatic** and **soil conditions** for the successful cultivation of this variety.





The Nutritional and Agricultural Promise of *Kufri jamunia*

Kufri jamunia represents an **important advancement in the development of biofortified potato varieties in India.** By combining good agronomic performance with enhanced nutritional quality, the variety offers benefits for both farmers and consumers. Its rich content of antioxidants, vitamins, and micronutrients makes it a valuable addition to efforts to improve dietary diversity and address hidden hunger. With its attractive appearance, culinary versatility, and adaptability to several states in the North Indian plains, *Kufri jamunia* has strong potential for wider cultivation and consumption in the future.

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PIB Research





22

Wings of Change

10 Years of Redefining Regional Air Connectivity through UDAN

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Click here for Hindi

UDAN completes ten years in 2026. Over the past decade, it has expanded India's regional aviation network, connecting unserved & underserved regions and improving access to air travel. Regional connectivity has supported tourism, medical access, agricultural trade and local employment, with airports such as Tezu, Deoghar and Kishangarh illustrating its impact. The launch of Modified UDAN marks the next phase of the scheme. It focuses on strengthening aviation infrastructure, ensuring operational sustainability and expanding regional air connectivity.

Connecting Regional India

Air connectivity plays an important role in regional development. It facilitates access to markets, supports tourism and expands economic opportunities. However, connecting remote and underserved areas remains important for ensuring wider access to air travel. Recognising this need, the National Civil Aviation Policy 2016 prioritised affordable **regional connectivity through financial support and infrastructure development.**

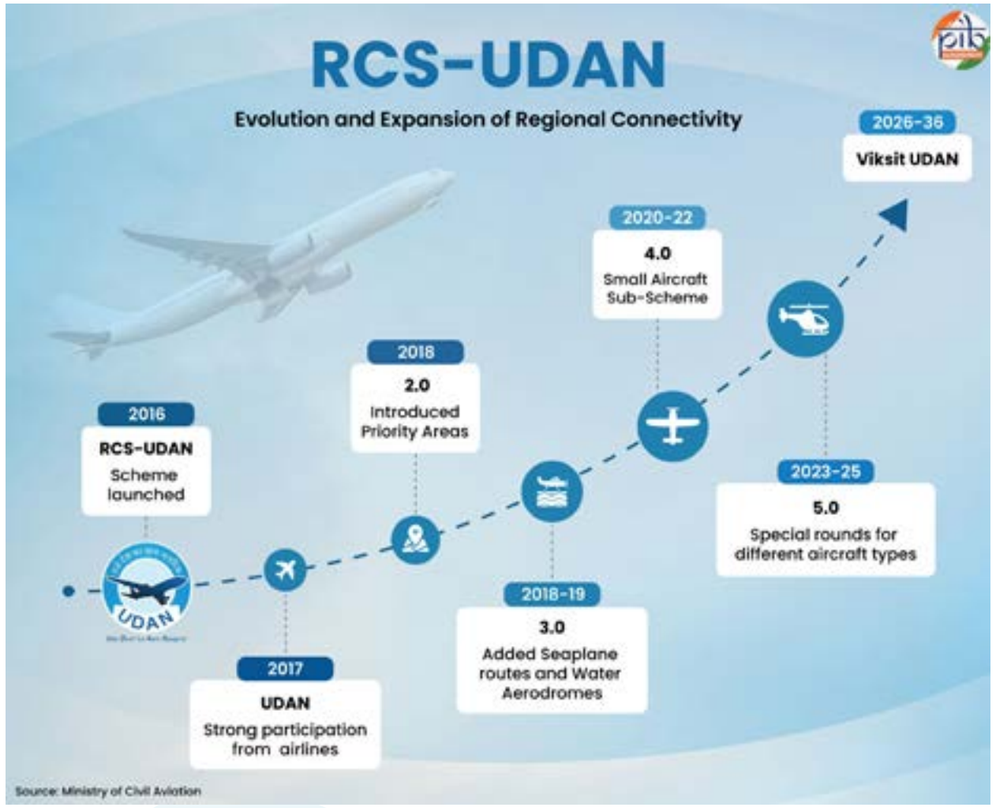
In line with this objective, the **Regional Connectivity Scheme (RCS)**, also known as **UDAN (Ude Desh ka Aam Nagrik),** was launched on **21 October 2016.** The scheme anchors its ambition on a simple yet transformative premise: making **affordable yet economically viable and profitable air travel on regional routes.**

As UDAN completes ten years, it has expanded regional air connectivity and improved access to air travel for citizens by connecting unserved and underserved airports. A recap of the past decade reflects the rapid expansion of India's civil aviation footprint. India is now the world's **third-largest domestic aviation market**, with operational airports increasing from **74 in 2014 to 166 till date.** At the heart of this, transformation lies the UDAN scheme.

Building on this progress, the next phase of UDAN was launched on **4 July 2026.** The scheme now places greater emphasis on **Centre-State/UTs partnerships.** It will be complemented by a **Challenge Mode Portal for Aerodrome Development** dedicated to identifying airstrips and helipads. Together, these measures will further expand regional aviation infrastructure.

The First Decade of UDAN

UDAN entered its operational stage with the inauguration of the **first RCS-UDAN flight** from **Shimla to Delhi** in **April 2017.**



Since then, the scheme has expanded regional air connectivity.

- **Routes Operationalised:** The scheme has operationalised 687 regional routes across India.
- **Aerodromes Operationalised:** A total of 95 aerodromes have been operationalised, including 17 heliports and 02 water aerodromes.
- **Flights Operated:** More than 3.68 lakh flights have been operated under the scheme.
- **Passengers Carried:** The scheme has facilitated air travel for 1.72 crore passengers.

The scheme uses market-based selection, airfare caps, concessions, and Viability Gap Funding (VGF) to encourage airline participation. As of 15 October 2026, **Rs 5091.23 crore has been disbursed under VGF.**

Alongside expansion of civil aviation, sectoral jobs have grown from around **3 million in 2014** to nearly **7.7 million in 2026.** Additionally, it has the potential to reach 25 million by 2040.

North-Eastern Region under UDAN

Due to the difficult hilly terrain, the north-eastern states remain under-connected, which makes strengthening air connectivity an important development priority.

- **Under UDAN,** across the North-Eastern States, **90 priority RCS routes have been operationalised.**
- **52 aerodromes,** including **heliports** and **water aerodromes,** have also been **identified** in the region, of which **12 have been operationalised.**

Transitioning to Next Phase of UDAN

Since its inception, RCS-UDAN has released multiple versions of the scheme. Building on the achievements under it, the next phase of UDAN Scheme was formally **launched on 4 July 2026.** The scheme will be implemented in **ten years,** from **FY 2026-27 to FY 2035-36,** with a total outlay of **Rs 28,840 crore.** The focus is now on building an ecosystem towards facilitating Made in India Civil aircraft.

The scheme emphasises **affordable air travel, sustainable regional aviation operations, aerodrome development through a Challenge Mode framework, and indigenous aircraft manufacturing.**

The Modified UDAN Scheme introduces targeted measures to support sustainable growth and long-term viability of regional aviation.

- **Development of Aerodromes (CAPEX):** 100 airports will be developed from existing unserved airstrips, with an outlay of Rs 12,159 crore over eight years. This amounts to a proposed allocation of Rs 100 crore per airport.
- **Operation and Maintenance (O&M) of Aerodromes:** Three years of O&M support will be provided for approximately 441 aerodromes, with an estimated outlay of Rs 2,577 crore. The financial support is capped at Rs 3.06 crore per airport per year and Rs 0.90 crore per heliport or water aerodrome per year.
- **Development of Modern Helipads:** 200 modern helipads to be developed at an estimated cost of Rs 15 crore each. The total projected outlay is Rs 3,661 crore over eight years.
- **Viability Gap Funding for Airlines:** Rs 10,043 crore allocated over ten years to support airlines operating regional routes. Funding is available for up to five years, with tapered support from the third year and route exclusivity limited to three years.
- **Atmanirbhar Bharat and Indigenous Aviation Capacity:** An allocation of **Rs 400 crore** is proposed for two HAL Dhruv helicopters for Pawan Hans and two HAL Dornier aircraft for Alliance Air. The initiative supports indigenous aviation under Atmanirbhar Bharat and aims to strengthen connectivity in remote areas and challenging terrain.

The Next Phase Takes Shape

In the next phase of UDAN, the scheme will have a **three-pronged approach** focusing on **strengthening Centre-State/UT partnerships, creating aviation infrastructure and expanding regional air connectivity.**

- **Centre-State/UT Coordination:** A total of 21 MoUs were signed between the Government, participating States and Union Territories, and the Airports Authority of India (AAI). These establish a framework for coordinated identification, development and operationalisation of aviation assets. The framework will align with regional connectivity requirements and State/UT priorities.
- **Challenge Mode Portal for Aerodrome Development:** The dedicated portal enables State Governments and UT Administrations to nominate airstrips and helipads for development under the next phase of UDAN. This allows States and UTs to identify locations with potential for aviation connectivity. This will facilitate the creation and upgradation of aviation infrastructure based on local requirements.

Regional Changes under UDAN

The operationalisation of regional airports under UDAN has driven socio-economic transformation across regional hubs, boosting local trade, medical access, tourism, and employment.

Purnea Airport in Bihar

Prior to 2025, residents of the Seemanchal and Kosi regions, including Purnea, Araria, Kishanganj, Katihar, and Bhagalpur, were required **to travel over 200 km to Bagdogra Airport for air connectivity.** Journeys to major cities such as **Kolkata and Patna often involved arduous road travel of 10 hours and 8 hours, respectively.** Despite being a prominent agricultural hub known



for products such as makhana, litchi, and vegetables, the region lacked direct air connectivity and air cargo facilities, constraining its economic potential. The operationalization of Purnea Airport in 2025 transformed regional connectivity by providing air **access to more than 10 districts of Bihar. Travel time to Kolkata has been reduced to nearly 2 hours and to Patna to about 1 hour,** significantly improving accessibility for residents, businesses, and institutions. The airport, equipped with **Bihar's longest runway of approximately 2.8 km capable of handling A320 and B737 aircraft,** has strengthened the region's integration with major economic centres. Furthermore, the enhanced connectivity has **stimulated local economic activity.**

Tezu Airport in Arunachal Pradesh

Situated in India's easternmost frontier near the China border, the Lohit district of Arunachal Pradesh previously lacked air connectivity. **It forced residents to undertake journeys of over 10+ hours across 164 km to Dibrugarh or 610 km to Guwahati** for flights and medical emergencies. **Operationalised in 2021, Tezu Airport now connects over 2 lakh people** in this remote territory. The airport has **reduced travel time to Guwahati to 1 hour.** The facility has enabled **air cargo exports for agricultural produce** such as ginger, cardamom, and rice.



Deoghar Airport in Jharkhand

Prior to July 2022, reaching Deoghar required arduous journeys of **over 15 hours from Delhi or 7.5 hours from Kolkata by road or rail.** Pilgrims visiting **Baba Baidyanath Dham** were forced to travel more than 150 km to 200 km to reach the nearest operational airports in Ranchi or Patna. The **opening of Deoghar Airport drastically cut travel time from Delhi to just 2 hours.** Post July 2022, over **10 lakh+ pilgrims fly directly to Deoghar annually**. The airport **provides direct access for 50+ lakh devotees visiting during the peak Kanwar Yatra month.** Furthermore, the airport has **promoted medical tourism** by facilitating patient travel to **AIIMS Deoghar from East India.** Additionally, it has boosted **local hospitality,** leading to the **establishment of over 30+ new hotels.**



Kishangarh Airport in Rajasthan

Before direct air access in 2017, travellers in Kishangarh, Ajmer, and Pushkar **travelled 100+ km to Jaipur for flights.** This bottleneck affected the region's marble hub business. It also **impacted over 2 crore annual pilgrims visiting Ajmer Sharif Dargah and Pushkar Temple.** Post 2017, direct air cargo connectivity has enabled marble exports to Italy, the UAE, and the USA. In 2022, the airport hosted Avyanna Aviation Academy, the region's only Category 'A' Flying Training Organisation (FTO). The airport **generated 200+ direct jobs.** It also spurred a **40–50% rise in local real estate values.**



The Horizon Ahead

UDAN has spent the last decade redefining India's regional connectivity by operationalising routes and aerodromes and carrying crores of passengers. The next phase of regional aviation will depend on developing infrastructure that supports reliable and sustained operations across diverse geographies. Through the Modified UDAN Scheme, the focus extends to aerodrome development, operational support and indigenous aviation capacity. These measures seek to address the infrastructure and viability challenges of regional air travel. They aim to create a stronger foundation for connectivity across India.

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23

Women, Work and Enterprise: India’s Push for Better Livelihoods

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Click here for Hindi

India's women employment story is moving from participation to better-quality work. PLFS shows female Labour Force Participation Rate (LFPR) rising from 23.3% in 2017-18 to 40% in 2025, while Worker Population Rate (WPR) increased from 22% to 38.8%. Building on this improvement, policy support is strengthening women's work through formal enterprise recognition, credit, market access, safer workplaces, skilling and new livelihood avenues. Now, the focus is on turning higher participation into stronger income, security and economic development.

Rising Women's Employment and Expanding Economic Opportunities

Women's employment in India is moving beyond presence alone. The **rise in labour force participation marks an important shift,** alongside greater focus on the nature and quality of employment. **As more women enter the labour force, the next dimension of progress lies in the opportunities that work creates.** Economic empowerment is strengthened when employment provides income, security, recognition and greater control over economic choices.

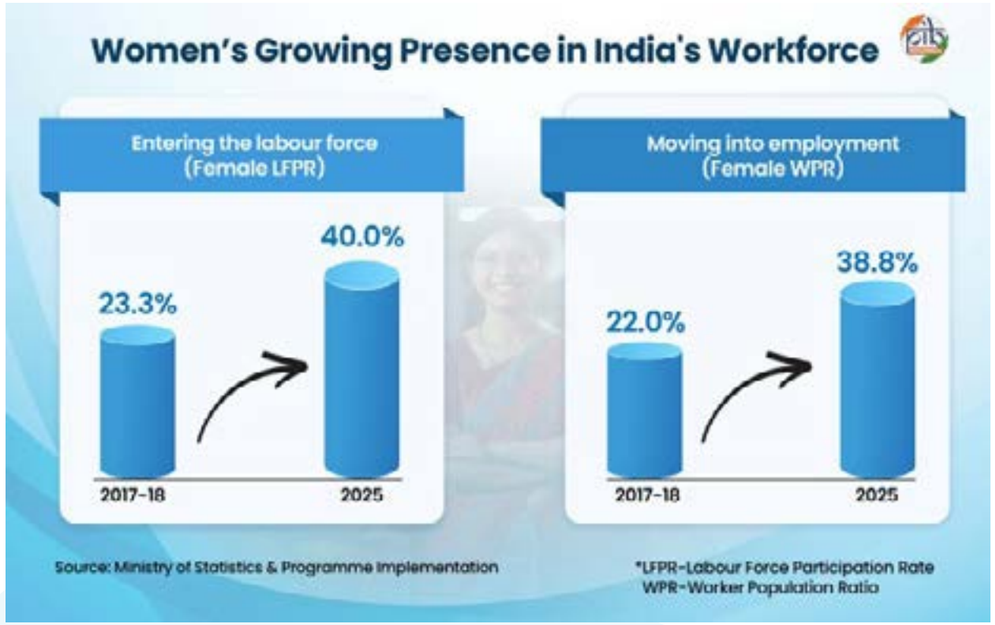
This broader transition is being supported through policies that expand women's access to **safer workplaces, social protection, entrepreneurship, formalisation and financial opportunities.** These measures help strengthen the quality of women's participation in the economy, translating into secure and empowering opportunities.

Quantity Shift: Rise in Workforce Participation

Women's engagement with India's labour market has strengthened considerably in recent years. For women aged 15 years and above, **LFPR increased from 23.3% in 2017-18** to **40.0% in 2025.**

This increase has also translated into a larger share of women actually working. **WPR** increased from **22.0% for women in 2017-18 to 38.8% in 2025.** In absolute terms, an estimated **20 crore women aged 15 years and above were employed in India during 2025.**

- **Labour Force Participation Rate (LFPR)** measures the share of the population that is either working or seeking or available for work.
- **Worker Population Ratio (WPR)** measures the proportion of employed persons in the population.



Women as Workers, Entrepreneurs and Economic Contributors

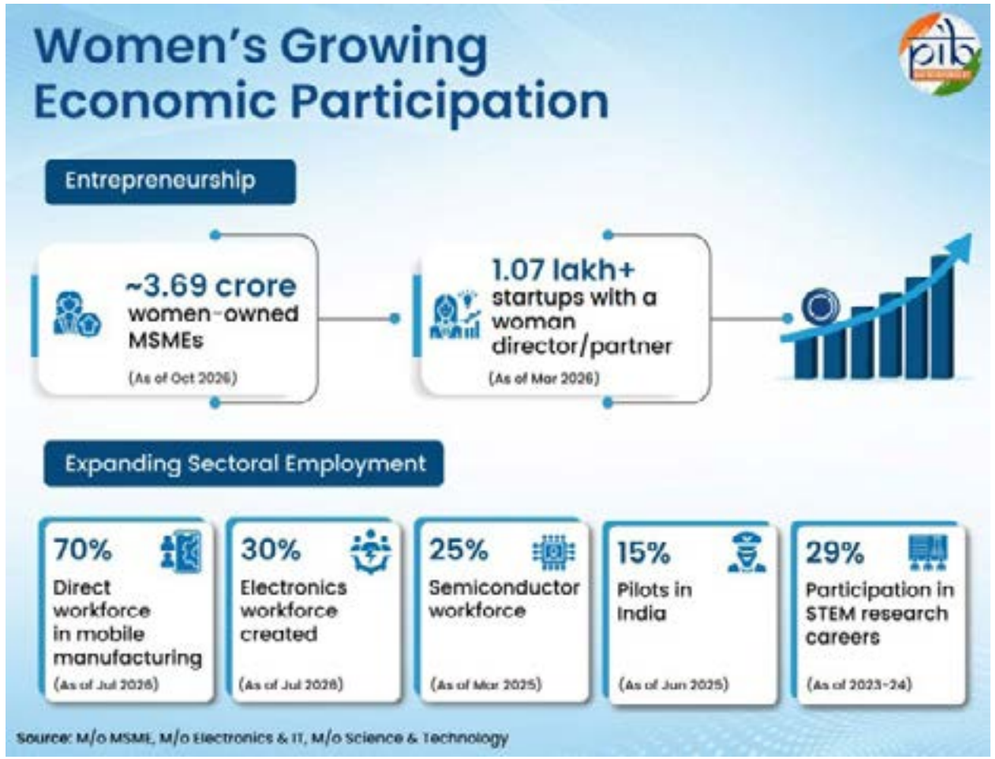
As participation expands, the nature of women's engagement with the economy is also changing.

Women's Growing Presence in Enterprise

An increasing number of women are taking up entrepreneurship and establishing their own businesses. Women's entrepreneurship broadens economic participation by creating opportunities to earn, build assets and grow businesses. It strengthens financial

independence while expanding skills and access to resources.

- **Women-owned MSMEs:** As of October 2026, **~3.69 crore registered MSMEs were women-owned,** representing **~38% of all registrations.**
- **Women in startups:** By March 2026, over **1.07 lakh recognised startups** had at least one-woman director or partner. These accounted for approximately **48% of all recognised startups.**



Women in Technology and High-Skill Sectors

Alongside entrepreneurship, women's participation is also expanding across manufacturing and high-skill sectors.

- As on July 2026, women constitute nearly **70% of the direct workforce** in mobile phone manufacturing. Across the wider electronics manufacturing sector, women account for nearly **30% of the workforce created over the last decade.**
- Women are also building a significant presence in the semiconductor industry. They constitute around **25% of the workforce** and nearly a fourth of India's chip design and engineering workforce (as on March 2025).
- The civil aviation sector similarly reflects growing women's participation in specialised roles. Women account for **15% of pilots** in India, among the **highest** shares globally. Additionally, women account for **15% of air traffic controllers, 11% of flight dispatchers** and **33% of Flight Operations Inspectors in DGCA** (as on June 2025).
- The expansion is also visible in India's research ecosystem. The Research & Development Statistics 2025-26 report shows that women's participation in STEM research careers increased from **13% in 2000-01 to 18.6% in 2020-21 and 29% in 2023-24.**

Building Women-Led Enterprises from Recognition to Growth

As women build businesses across different segments, support for their long-term growth becomes increasingly important. Formal recognition, finance and market access provide key areas for strengthening women-led enterprises.

Formalisation: Giving Women's Work an Economic Identity

Many women-led economic activities begin at a small scale, making formal recognition important. Formalisation provides an official identity and improves access to credit, government schemes, skills and business development services.

A) Swavalambini Scheme (2025) : The scheme supports young women from business ideation to enterprise creation through entrepreneurship training, finance and market guidance, and legal support. Selected participants also receive 21 weeks of mentorship and handholding to help develop sustainable enterprises.

> It was launched in February 2025 as a pilot across **six** higher education institutions in Assam, Meghalaya, Mizoram, Uttar Pradesh and Telangana.

The targets under the Swavalambini pilot have been achieved.

- A total of **82 faculty members** had been trained under Faculty Development Programme;
- **1276 participants** have been trained out of 1200 participants under Entrepreneurship Awareness

Programme; and

- A total of **602 participants** have been trained out of 600 participants under Entrepreneurship Development Programme.

B) Yashasvini Campaign (2024): The campaign aims to promote greater participation of women in entrepreneurship by achieving **gender parity on the Udyam Registration Portal and Udyam Assist Platform by 2029.** It also seeks to promote the mandated **3% public procurement target for women-owned micro and small enterprises (MSEs).**

It also supports existing and prospective women entrepreneurs through awareness, handholding and capacity-building initiatives. As on **July 2026,** the Yashasvini Campaign had facilitated over **22 lakh women-owned MSME registrations**. Furthermore, in FY 2025-26, total procurement from women-owned MSEs was 3.8%, exceeding the 3% public procurement target.

Credit: Financing Enterprise Growth

Formalisation brings enterprises into the recognised business ecosystem, while **access to finance enables them to invest, innovate and expand.**

Financial Support for Women-led MSMEs

A) Pradhan Mantri MUDRA Yojana (PMMY) : Launched in 2015, PMMY seeks to expand access to collateral-free credit up to ₹20 lakh for micro and small enterprises engaged in non-corporate and non-farm income generating activities.

- Since inception, **PMMY had sanctioned more than 57.79 crore loans by April 2026,** with women entrepreneurs accounting for **two-thirds** of all loans sanctioned.

B) Credit Guarantee Scheme for Micro and Small Enterprises: The Scheme was launched to strengthen credit delivery to MSEs and improve access to finance for unserved and underserved entrepreneurs. Under the Scheme, **women-led MSEs receive enhanced guarantee coverage of 90%, along with a 10% concession on the guarantee fee.**

- As on **February 2026** (FY 2000-01 to FY 2025-26), it approved **~30.75 lakh guarantees** worth **~₹2.07 lakh crore** for women-owned MSEs.

C) Prime Minister's Employment Generation Programme (PMEGP): The PMEGP is a **credit-linked subsidy scheme** that supports new micro-enterprises in the non-farm sector. Beneficiaries receive margin-money (subsidy) assistance against bank loans. Under the Scheme, women are eligible for a **25% subsidy in urban areas and**



35% in rural areas.

- By **May 2026,** women accounted for nearly **40% of all micro-enterprises assisted** under PMEGP. They also received around **45% of the total margin-money subsidy disbursed.**

Financial Support for Women-led Startups

Launched in **2016, Startup India** is the flagship Government of India initiative to promote innovation and build a strong startup ecosystem. **Under this, the Government supports** startups across sectors and at different stages of their business cycle through multiple funding initiatives.

A) Fund of Funds for Startups (FFS): Established in **2016,** FFS supports startup funding by providing capital to SEBI-registered Alternative Investment Funds (AIFs). In turn, AIFs invest in startups through equity and equity-linked instruments.

- As of **January 2026,** supported AIFs have invested **~₹2,995 crore** in **women-led startups** from 2025 onwards.

B) Startup India Seed Fund Scheme (SISFS): Launched in 2021, it provides seed funding to startups across sectors through approved incubators.

- As of **January 2026,** incubators supported under the Scheme had approved **~₹294 crore** in funding for women-led startups.

C) Credit Guarantee Scheme for Startups (CGSS): Operationalised from April 2023, CGSS supports collateral-free debt funding for eligible startups.

It provides credit guarantees on loans extended by banks, financial institutions, NBFCs and SEBI-registered AIFs.

- As on **January 2026,** loans amounting to **~₹39 crore** have been guaranteed to women-led startups.

Market Access: Connecting Women's Work to Buyers

Market access helps women entrepreneurs reach more buyers and better understand demand, quality standards, branding and pricing.

A) Womaniya Initiative: Womaniya is an inclusion-focused initiative on the Government e-Marketplace that connects women-owned MSEs and SHGs with formal government buyers. Through a dedicated digital interface, they can register and list products such as handloom, jute, coir and home décor items.

- By July 2026, **over 2.17 lakh women-owned MSEs were registered on GeM** (a dedicated e-market for different goods & services procured by Government Organisations / Departments / PSUs).

- In FY 2025-26, total contract value exceeded ₹28,000 crore to women MSEs, marking 27.6% growth over the previous year.

- **Women received 5.6% of the total order value awarded through GeM,** exceeding the mandated procurement target of 3%.

For detailed information, may refer to: [Womaniya: Building Inclusive Market Access for Women Entrepreneurs]

B) Procurement & Marketing Support Scheme (PMS) : The Scheme helps registered MSEs access markets through trade fairs, exhibitions, vendor-development programmes, e-commerce and packaging support. Women-owned MSEs are eligible for a 100% subsidy on built-up space rent for trade fairs.

C) MSME Trade Enablement & Marketing (TEAM) initiative : To provide MSE with access to digital marketing, the TEAM initiative was launched for three years (2024-27) under the RAMP Programme. It aims to empower MSEs to access new markets, expand their customer base and boost income via **Open Network for Digital Commerce (ONDC).**

- Up till **2025-26 , 1,700 women-owned MSEs were registered** under the initiative.

Market access completes the enterprise value chain. Formalisation gives enterprises an identity, credit enables production, and market support turns production into income and sustainable growth.



Building the Skills Pipeline for Emerging Sectors

As women's opportunities expand across technology and specialised sectors, future-ready skilling becomes important for widening access to these roles.

Women Candidates Trained Across Emerging Sectors under Major Skill Development Schemes (2021-22 to 2025-26)

Scheme	Objective	Sector		
		Artificial Intelligence	Semiconductor	Renewable Energy
Pradhan Mantri Kaushal Vikas Yojana 4.0 (PMKVY 4.0)	Emphasis on training in futuristic and new-age technologies, including artificial intelligence.	20,393	5,927	76,671

National Apprenticeship Promotion Scheme (NAPS)	Promotes apprenticeship training through paid on-the-job experience across traditional and emerging sectors, supported by direct stipend assistance for trainees.	1,534	-	19,899
Craftsman Training Scheme (CTS) through Industrial Training Institutes (ITIs)	Provides vocational and technical training through ITIs, building job-ready skills across traditional and emerging trades.	512	31	5,753

Targeted Initiatives for Women

A) Nurturing Aspirations through Vocational Training for Young Adolescent Girls (NAVYA): Launched in 2025, NAVYA aims to provide targeted skilling of 3,850 adolescent girls under PMKVY 4.0 in non-traditional and future-oriented job roles. As of 31 August 2026, 1,105 girls have been trained under the Scheme.

B) AI Careers for Women: Launched in **2025,** the programme is **establishing 30 Centres of Excellence** in women's colleges across six states. These centres will **support 150 spoke centres** across Tier-II and Tier-III towns.

It aims to provide 20,000 learners with practical, industry-relevant AI training and project-based experience. Participants will receive certifications, internships, apprenticeships, fellowships, career guidance and access to AI-enabled job opportunities.

C) Women in Science and Engineering–Knowledge Involvement in Research Advancement through Nurturing (WISE-KIRAN) : The Scheme promotes women's participation in science and technology R&D through fellowship and institutional programmes.

- Fellowships include **WISE Fellowship for Ph.D. (WISE-PhD), WISE Post-Doctoral Fellowship (WISE-PDF), WISE–Societal Challenges with Opportunities (WISE-SCOPE), WISE Internship in Intellectual Property Rights (WISE-IPR) and Women's Instinct for Developing and Ushering in Scientific Heights and Innovations (WIDUSHI).** These support doctoral and post-doctoral research, career re-entry, translational research, IPR training and continued research engagement.

- Institutional programmes include **Consolidation of University Research for Innovation and Excellence (CURIE), Vigyan Jyoti, Gender Advancement for Transforming Institutions (GATI) and the Women in Space Leadership Programme (WiSLP).**

- In 2025-26, **180** women pursued PhDs, **606** women scientists received post-doctoral or translational research support, **26** senior scientists received R&D support, and **29,443** schoolgirls were supported in STEM.

- More than **110** women scientists gained employment, **450+** saw research participation, skill upgradation or career re-entry.

These initiatives are strengthening women's pathways into emerging and specialised fields through skilling and research support.

Labour Reforms Ensuring Safer Work Opportunities

For women, wider participation in the workforce depends not only on the availability of jobs, but also on whether those jobs can be accessed and sustained. Labour regulation plays an important role in shaping these conditions.

In November 2025, the Government **consolidated 29 existing labour laws into four Labour Codes:** the Code on Wages, 2019, the Industrial Relations Code, Code on Social Security, and Occupational Safety, Health and Working Conditions Code, 2020.

Within this consolidated framework, several provisions strengthen women's workplace rights, safety, representation and access to employment.

- **Grievance representation:** Women must be represented in Grievance Redressal Committees in proportion to their workforce share.

- **Maternity benefits:** Eligible women receive up to **26 weeks of paid**

maternity leave. Adoptive and commissioning mothers (a biological mother who uses surrogacy) are entitled to **12 weeks of maternity leave.** Other key provisions include:

» Women are entitled to **₹3,500 as medical bonus** where free prenatal and postnatal care is not provided.

» Women are entitled to **two nursing breaks** during the working day until the child is 15 months old.

» Establishments with at least 50 workers must provide **crèche facilities.** The employer must allow four visits a day by the woman to the crèche which includes the rest intervals.

- **Wider work opportunities:** Women may work in all establishments, including night shifts with consent and prescribed safeguards.

- **Prohibition of Gender Discrimination:** Gender discrimination in recruitment, wages and employment conditions is prohibited.

- **Policy representation:** Women must constitute one-third of Central/ State Advisory Boards. The Board shall advice on minimum wages and measures to expand women's employment.

Stronger Pathways for Women's Work

India's approach to women's work is increasingly focused on strengthening the conditions in which women can **work and progress economically.**



As opportunities widen, women's contribution is becoming more visible across employment, entrepreneurship and newer areas of the economy.

Greater access to skills, finance, markets and enabling workplaces further supports these pathways. **This will deepen women's role in India's growth and advance women-led development on the journey towards Viksit Bharat.**

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Asian Games 2026

India’s Journey from New Delhi to Aichi-Nagoya

Published on: 06 October 2026

Click here for Hindi

Asian Games 2026 at a Glance

The Asian Games, also known as **Asiad,** are the biggest sports competition in Asia, **held once every four years**. They are **organized by the Olympic Council of Asia (OCA)** and currently have **45 participating countries or regions.** The **20th Asian Games were held in Aichi-Nagoya, Japan, from September 19 to October 4, 2026.** The official slogan was **"Imagine One Asia."** This is the third time that Japan has hosted the Asian Games, following the earlier editions held in **Tokyo (1958)** and **Hiroshima (1994).**

This major event was spread over 16 days of intense world-class competitions. It featured 43 sports and 71 disciplines in a grand showcase of athletic excellence. A total of 1,407 medals were awarded across 469 exciting events during the Games.



Alongside the Asian Games, Japan also hosting the 5th Asian Para Games from October 18 to October 24, 2026, in Aichi-Nagoya. This marks the first time Japan has hosted the Para Games.

Understanding the Asian Games 2026 Emblem

The colour and design of the official emblem combine local and cultural significance with dynamics of sports. While the curves represent liveliness, the purple, gold, and green centre lines evoke the image of people uniting and advancing towards a bright red sun-the official symbol of the Olympic Council of Asia (OCA). **Purple** represents Aichi's prefectural flower, the iris; **gold** symbolizes Kinshachi, the iconic golden tiger-fish roof ornaments of Nagoya Castle; and **green** reflects the strong environmental consciousness of Aichi-Nagoya, fostered through landmark events such as EXPO 2005 Aichi, COP10, and the UNESCO World Conference on ESD. The emblem contains the first letters of Asia, Aichi and Nagoya initials: "A" is depicted in the purple curve and centre line, "N" in purple and gold.

Asian Games 2026 Official Mascot

"HONOHON," the mascot of the 20th Asian Games, represents the fiery passion of athletes. The name is derived from the Japanese word 'honoho', connected to the origin of the Japanese word for flame. It's design is inspired by the Shachihoko, one of the distinctive symbols of the Nagoya Castle and guarding deity of Aichi-Nagoya.



First Asian Games in 1951: India's Founding Role

India's connection with the Asian Games goes back to the very beginning, when the first edition was held in New Delhi in 1951. This was done against the backdrop of post-World War II efforts to strengthen ties among Asian nations, with several regions of Asia having been recently decolonized. The idea of an Asian sporting competition was mooted by India as a means to display unity and rebuild the bonds between Asian nations that the war had broken. The idea of the Asian Games was first conceived by Prof. G.D. Sondhi, a member of the International Olympic Committee (IOC) for India. The suggestion for holding the Asian Games was first made at a conference of Asian Countries held in New Delhi in 1947, and it was decided to call it the Asian Games.



First Asian Games opening ceremony

The inaugural Asian Games were held in New Delhi in March, 1951. President Rajendra Prasad declared them open at the National Stadium. **Eleven nations sent 489 athletes to compete across six sports at that first edition.** India finished second in the medal table that year, behind Japan. Since then, the Games have become a big event that fosters friendship through sports and contributes to world peace by recognizing diversity.

India's Contingent at Aichi-Nagoya 2026

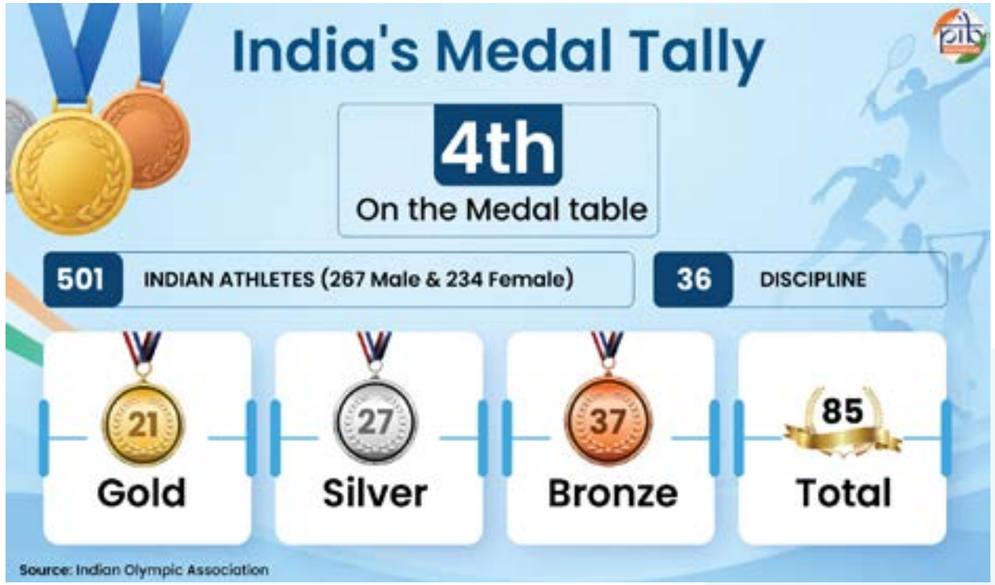
India fielded one of its largest-ever multi-sport delegations at the Asian Games 2026, with a **501-athlete contingent** across **36 sporting disciplines. More than 300 athletes in the contingent were making their Asian Games debut.**

A grand send-off ceremony was held in New Delhi on 8 September 2026, ahead of the team's departure. Union Minister Dr Mandaviya, Indian Olympic Association (IOA) President Dr P.T. Usha and Chef de Mission Sahdev Yadav attended the event, and the official contingent jersey was unveiled. The Indian Olympic Association organised the event.



Dr. Mandaviya (Centre), along with IOA President Dr. P.T. Usha (right) & Secretary (Sports) Hari Ranjan Rao (left), unveiled the official contingent jersey ahead of the Asian Games 2026.

Image Source: Ministry of Youth Affairs and Sports



At the opening ceremony on 19 September 2026, double Olympic medallist Manu Bhaker and Kabaddi player Pawan Sehrawat **led India's parade**.

India's Gold Medal Triumph at Aichi-Nagoya 2026

India's campaign at the 2026 Asian Games was highlighted by a 21-gold-medal haul, anchored by strong performances across precision events and team sports. **Archery** led the gold tally with **5 titles**, supported by **Shooting** and **Boxing**, which each won **3 gold medals**. In team sports, India executed a sweeping "gold rush" across Cricket, Hockey, and Kabaddi, securing 2 gold medals in each sport. Standout performances included the men's cricket team defeating Pakistan by 19 runs in the final, the men's hockey team retaining their continental title with a resounding 5-1 victory over Malaysia, and double gold victories across both the men's and women's kabaddi competitions. Further gold medals in Wrestling (2), Athletics (1) and Golf (1) brought India's total to 21, reflecting the country's strong and diverse performance across the continental sporting arena.

India's Medal Tally at the Asian Games 2026
Sport-wise Breakdown

Sport	Gold	Silver	Bronze	Total
Athletics	1	9	14	24
Shooting	3	8	4	15
Archery	5	2	2	9
Boxing	3	0	3	6
Wrestling	2	2	2	6
Squash	0	2	3	5
Sailing	0	1	2	3

Cricket	2	0	0	2
Hockey	2	0	0	2
Kabaddi	2	0	0	2
Golf	1	1	0	2
Weightlifting	0	1	0	1
Wushu	0	1	0	1
Badminton	0	0	1	1
Kurash	0	0	1	1
Mixed Martial Arts	0	0	1	1
Rowing	0	0	1	1
Sepak Takraw	0	0	1	1
Soft Tennis	0	0	1	1
Table Tennis	0	0	1	1
Total	**21**	**27**	**37**	**85**







India's Participation in the Aichi-Nagoya 2026 Asian Para Games

The Aichi-Nagoya 2026 Asian Para Games will be held in Japan from 18 to 24 October 2026. Around 3,000 athletes from 45 National Paralympic Committees across Asia are expected to compete at these Games. The Games will feature eighteen Para sports.

India will participate through the Paralympic Committee of India, its recognised National Paralympic Committee for the Games. This will mark India's fifth appearance at the Asian Para Games, following its record 111-medal haul including 29 Gold medals at Hangzhou 2022 Asian Para Games. Out of the 111 medals, female athletes contributed 40 medals (36% of the medal tally). Previously, India had won 14 medals in the 2010 edition, 33 in 2014 and 72 in 2018.

From Grassroots to Global Podiums: India's Policy Push for Sports

Khelo Bharat Niti

The Government launched **Khelo Bharat Niti,** India's national sports policy, on 1 July 2025. It seeks to build a strong, inclusive, and performance-driven sports system. It focuses on bridging the rural-urban gap in training and facilities. It stresses community participation and partnerships to reduce training costs. The policy sets its sights on excellence at the 2036 Olympics. It links sports with school education under the National Education Policy 2020. It also supports women, tribal communities, and persons with disabilities.

Record Financial Support

The Union Budget 2026-27 allocated a record ₹4,479.88 crore to the sports ministry. This is up from **₹1,219 crore** in 2013-14. The Cabinet has also approved a revamped Khelo India scheme for 2026-27 to 2030-31. With support to National Sports Federations, the combined outlay is **₹36,441 crore**. Khelo India alone received **₹924.35 crore for 2026–27.** Earlier, the scheme had a ₹3,790.50 crore outlay for 2021–22 to 2025–26. The Budget also earmarked **₹500 crore for sports goods manufacturing**

Finding Talent Early

Khelo India is the flagship programme for grassroots sport. By July 2026, it had set up **1,067** Khelo India Centres. It has approved **349** new sports infrastructure projects worth **₹3,176 crore**. It supports **2,745** Khelo India Athletes with coaching, equipment, medical care, and a monthly allowance. More than **63,000** athletes have competed in the Khelo India Games since 2018.

The **Khelo India Rising Talent Identification (KIRTI)** initiative identifies and nurtures talent among children aged 9 to 18 years. Its **174** Talent Assessment Centres use data tools for fair, merit-based selection.

Backing Top Athletes

The Target Olympic Podium Scheme (TOPS) supports India's athletes. It supports athletes through foreign training, international competitions, coaching camps, and specialised equipment. Athletes receive a **monthly stipend of ₹50,000.** Junior athletes in the Development Group receive ₹25,000 a month. As of April 2026, TOPS supports **55 Core Athletes, 62 Para Core Athletes** and **140 Development Athletes; in addition, 67 core athletes are in hockey.** TOPS played an important role in India's medals at the Tokyo 2020 and Paris 2024 Olympic Games.

Education, Fitness and Fair Play

The **National Sports University** in Imphal was established in 2018. It offers education in sports science, technology, management and coaching.

The Fit India Movement encourages people to make fitness part of daily life. Parliament passed the **National Sports Governance Bill** in August 2025. It provides for a National Sports Board to recognise sports bodies. A National Sports Tribunal will settle sports disputes.

Beyond Aichi-Nagoya: India's Long Olympic Road

Aichi-Nagoya 2026 sits within India's broader roadmap toward the Los Angeles 2028 Olympics and beyond. More than three hundred of India's five-hundred-plus athletes are making their Asian Games debut this year. This scale of debutant participation reflects the growing depth and expanding bench strength of Indian sport today.

The government has also outlined a ten-year plan investing over ₹36,000 crore to strengthen sports infrastructure nationwide. This investment aims to firmly establish India on the global sporting stage well before 2036. The Sports Ministry has called for a coordinated 360-degree approach involving federations, states and other stakeholders.

India's 85-medal campaign at Aichi-Nagoya, including 21 gold medals, marks another significant chapter in the country's sporting journey. With strong performances across traditional strengths and emerging disciplines, the Games have added further momentum to India's preparations for the Los Angeles 2028 Olympics and its longer-term sporting ambitions.

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Additive Manufacturing in India

Building India’s Future with
Next Generation Digital Manufacturing

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Click here for Hindi

India is emerging as a competitive player in digital revolution through Additive Manufacturing (AM), a 3D printing technology in which digital file controls the process of manufacturing. The National Strategy for Additive Manufacturing (NSAM) is a strategy introduced in 2022 to build India's AM ecosystem. It has made steady progress so far, training over 1,54,000 individuals and supporting 56 AM start-ups. The strategy is now moving into its NSAM 2.0 phase, planning even bigger market than NSAM 1.0 - positioning AM as a building block of Atmanirbhar Bharat and Viksit Bharat.

India's Technology Story is Changing Gears

Over the last decade, India has moved from being only a user of technology to becoming a builder of it. Digital public infrastructure has already shown the world how India can build digital systems at population scale. That same confidence is now spreading from the digital world into the physical one - into how India designs, builds and manufactures things. This is where **Additive Manufacturing (AM)** enters the picture. It is the emerging technology and innovation that is quietly turning digital designs into real, physical objects.

Additive Manufacturing is becoming one of the newest engineering frontiers of India's manufacturing journey. The global AM machines market is projected to touch USD 149 billion by 2035, with the AM-electronics supply chain set to grow from USD 18 billion to USD 112 billion. This gives India a real opening to become a competitive manufacturer of AM platforms across polymers, metals, composites, ceramics and semiconductor-grade materials.

Understanding Additive Manufacturing Technology

AM is not just another manufacturing tool - it is a form of digital engineering that brings in a digital file that completely controls the layer-by-layer material deposition and sometime material composition to build an object. It brings in convergence of computing, electronics, design software and materials science. Every AM object starts out as a **digital file,** so the technology is closely linked to tools like **Computer-Aided Design (CAD),** Artificial Intelligence and pattern recognition. AM works on a simple but powerful idea - building an object up, rather than cutting it down. Here is how a digital design turns into a physical object, step by step:



- **Virtual design:** The process begins with a digital design made in a CAD (Computer-Aided Design) file - either modelled from scratch or captured using a 3D scanner or now a days made using AI from mobile phone photos.
- **STL file:** A STL (Standard Tessellation Language) file represents a 3D model as a collection of triangular surfaces. It is one of the commonly used file formats for preparing models for AM. This file instructs what to build to the machine.
- **Slicing:** Slicing software divides this digital model into hundreds or thousands of horizontal layers. Once done it instructs machine how to print layer-by-layer.
- **Printing:** The sliced file is fed into the AM machine, which reads each layer and builds the object step by step.

- **Additive Process:** An AM object is built by laying down successive layers of material until it takes its final shape. Technology evolution has taken digital manufacturing to such accuracies in deposition and composition control that without the digital instructions printing process fails to build properly. Currently there are 40+ such processes in market and R&D stage.
- **Final object:** The printer fuses successive layers of material together into a single, complete three-dimensional object. Once printed, post processing is done to make it marketable.

Additive Manufacturing Materials

In myriad applications, the following material categories have been revolutionary in Additive Manufacturing.

- **Thermoplastics:** Thermoplastic polymers are the most popular types of AM materials. Acrylonitrile butadiene styrene (ABS), polycarbonate (PC) and polylactic acid (PLA) each offer distinct advantages in different applications. Water-soluble polyvinyl alcohol (PVA) is typically used to create temporary support structures, which are later dissolved away.
- **Metals:** Different metals and metal alloys are used in additive manufacturing, which include precious metals like gold and silver to strategic metals like stainless steel and titanium.
- **Ceramics:** A variety of ceramics including zirconia, alumina and tricalcium phosphate are also used in additive manufacturing. Also, alternate layers of powdered glass and adhesive are baked together to develop entirely new classes of glass products.
- **Bio Materials:** The biomaterials used in AM applications include the hardened material like silicon, calcium phosphate and zinc to support bone structures as new bone growth occurs. The bio-inks fabricated from stem cells are also being explored by researchers to form blood vessels, bladders and many other human organs. Also 3D Printing of human organs such as liver tissues, kidney, heart etc. are being printed using biomaterials and living cells.

Reshaping Key Sectors of the Indian Economy

AM is no longer confined to labs and prototypes. It is already being adopted across critical sectors of India's economy and Strategic Sector, backed by government and private players projects on the ground.

Space & Aerospace

India's space programme is embracing additive manufacturing to build lighter, faster hardware. In May 2024, IIT Madras-incubated start-up **Agnikul Cosmos** launched Agnibaan - SOrTeD, featuring a single-piece, AM printed semi-cryogenic rocket engine. The mission demonstrated how additive manufacturing can enable complex engine designs and support faster, indigenous development of space hardware. NSAM is helping more such start-ups in their R&D for development of critical engine parts using AM.

Defence

The Armed Forces are turning to AM for faster, disaster-resilient construction. The Indian Army inaugurated its first AM-printed two-story dwelling unit at Ahmedabad, built in just 12 weeks, and has since extended the technology to precast defenses in operational terrains like Ladakh. NSAM is supporting all three branches of defense for establishing workshop level facilities for MRO applications.



Healthcare

India is building indigenous alternatives to imported medical technology through AM. MeitY has supported AM based medical device manufacturing and startups like OsteoForge that is AM printing natural silk-based implant development under NSAM. The Technology Development Board is supporting 3D-printed bone grafts made from indigenous bioceramic materials. The technology can create grafts customised to a patient's specific needs and anatomy. It can reduce imports, strengthen domestic medical manufacturing and support more personalised healthcare.

Electronics

India's network of AM centres is building indigenous capability in electronics-grade manufacturing. NSAM has successfully demonstrated AM printed

electronics components such as batteries, antennas, varistors, capacitors and many more. A globally first, IISc has demonstrated Photonic Integrated Circuit blocks using AM printing.

Construction

India is exploring 3D printing as a potential solution for faster and more sustainable construction. The Kelvin 6K Pro, an on-site 3D construction printer, has demonstrated the ability to build 2,500 sq ft homes in under 30 days using low-carbon geopolymer material. The technology has the potential to reduce material and logistics costs, lower carbon emissions and improve construction efficiency. Early applications indicate potential for 30% lower material and logistics costs and 90% lower emissions compared with cement-based construction.

Behind this growing momentum lies a clear government push. Over the past few years, the Centre has moved from isolated pilot projects to a structured, mission-mode approach for Additive Manufacturing -backed by dedicated funding, institutions and a national strategy. NSAM is now developing concrete based supercapacitors for solar energy storage.

Government Policy Initiatives: Building an Indian AM Ecosystem

Recognizing AM as a strategic, next-generation manufacturing technology, the Government of India is building a structured national ecosystem. This effort is anchored in the National Strategy for Additive Manufacturing (NSAM). It is supported by growing national platforms, institutions and initiatives that are strengthening the ecosystem.



National Strategy for Additive Manufacturing (NSAM)

The Ministry of Electronics and Information Technology (MeitY) released the National Strategy for Additive Manufacturing (NSAM) in February 2022. NSAM serves as India's guiding policy framework for 3D printing and additive manufacturing. Aligned with **Make in India** and **Atmanirbhar Bharat,** the strategy sets clear, time-bound national targets. These targets are being pursued through collaboration among the Centre, States, industry and academia.

The national strategy aims to capture **5% of the global additive manufacturing market** and add nearly **US$1 billion to India's GDP.** It also targets the development of **50 India-specific additive manufacturing technologies,** covering materials, machines, processes and software.

The strategy also seeks to nurture **100 new additive manufacturing start-ups** and develop 500 new products. It also aims to train **1 lakh skilled workers** for the additive manufacturing workforce. Another objective is to build additive manufacturing capabilities across **10 existing and emerging manufacturing sectors.**

To further advance these objectives, the Government has established **seven specialised Development and Deployment Centres.** These centres support research and development, skilling and hands-on technology access.



Did you Know?



The Government of India is nurturing 3D printing skills at the school level through **Atal Tinkering Labs (ATLs).** Each lab receives a grant of ₹20 lakh to set up dedicated innovation workspaces of 1,200–1,500 sq ft, equipped with Do-it-Yourself (DIY) kits including 3D printers, Robotics, and Internet of Things (IoT). This gives students from Grade VI to Grade XII hands-on exposure to Additive Manufacturing early on - helping build India's future AM workforce from the classroom itself.

Progress Under NSAM

More than four years after its launch, the **National Strategy for Additive Manufacturing (NSAM)** has made steady and measurable progress. Government-supported initiatives have strengthened India's additive manufacturing ecosystem through skilling, entrepreneurship, technology development and sectoral applications.

More than **1,54, 000 individuals** have been trained in additive manufacturing-related skills, creating a growing skilled workforce. **Fifty-six additive manufacturing start-ups** have also been supported, strengthening India's innovation and entrepreneurship base. The network of national centres has enabled the development of **65 India-specific technologies including materials, machines, Design for Additive Manufacturing (DfAM) and printed products.** These capabilities are supporting the development of products and prototypes across **aerospace, medical devices, electronics, energy, food processing and photonics.**

NSAM 2.0

NSAM 2.0 is being conceptualised to support India's aspiration for AM market acceleration. The next phase plans to accelerate Intellectual Property Rights (IPR) generation, grow AM network through Digital Integration and proposes to develop globally competitive additive manufacturing technologies for commercialization. It aims to improve the affordability of machines and materials through clusters and strengthen the additive manufacturing electronics value chain.

NSAM 2.0 is planning to expand the additive manufacturing start-up base, provide extensive support to Indian defense and promote Sustainable Development Goal (SDG)-driven pilot programmes. It proposes to deepen international cooperation through standards, joint research and technology partnerships. These priorities can strengthen India's technological capabilities and mainstream additive manufacturing across economic, industrial and societal applications

it is strengthening indigenous manufacturing and reducing reliance on imports. It is also supporting the vision of **Atmanirbhar Bharat** through greater domestic technological capabilities. As India scales its Additive Manufacturing ecosystem, it is creating skilled employment and strengthening its technology base. The technology also supports **Industry 5.0** through digital production, advanced automation,

National Additive Manufacturing Symposium (NAMS)

NAMS is a national platform for advancing India's Additive Manufacturing (AM) ecosystem. It brings policymakers, scientists, industry, start-ups, academia and other AM stake holders together on a common platform. The platform promotes coordinated progress across policy, research, innovation and industry.

MeitY organised the 2nd NAMS edition on 13 March 2026 in New Delhi. NAMS 2026 strengthened collaboration across India's AM ecosystem. MoUs were exchanged to deepen ecosystem partnerships, alongside the launch of new AM products. Panel discussions covered NSAM 2.0, defence adoption, industry perspectives and MeitY-supported R&D centres. The symposium also strengthened inter-ministerial coordination on AM applications. State Governments, industry and leading research institutions further strengthened the platform. These efforts highlight the growing relevance of AM across diverse sectors of the Indian economy.

Towards a Viksit Bharat

AM is steadily moving from India's research labs into factories, defence establishments and hospitals. Backed by focused government policies, distributed and flexible manufacturing. Its applications can further contribute to **Sustainable Development Goals (SDGs)** through resource efficiency, localised production and sustainable solutions.

Together, these efforts position AM as an emerging contributor to India's journey towards Viksit Bharat.

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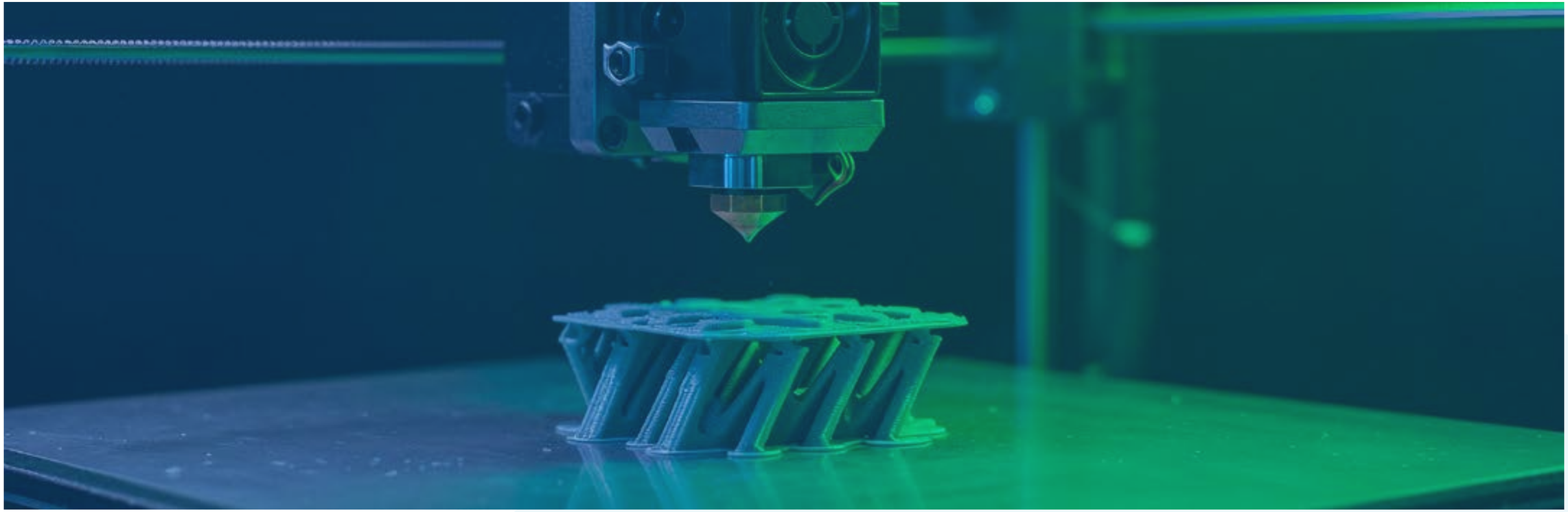
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SARAS Mela 2026

Taking Rural Women's Enterprises to the National Markets

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The SARAS Melas organized under the Centre's **DAY-NRLM** connect rural women entrepreneurs with wider markets, buyers, and business opportunities. The Vijayawada edition marks the **first National SARAS Mela outside Delhi-NCR,** bringing together women entrepreneurs from 34 states and UTs. The platform strengthens DAY-NRLM's efforts to promote sustainable livelihoods and supports the **Lakhpati Didi** vision of income growth. **Dedicated pavilions** offer opportunities for business learning, institutional support, and enterprise development. Digital platforms like **eSARAS** extend market access beyond physical events, helping rural women take their products to wider markets.

Where Rural Enterprise Meets Opportunity

India's rural economy is rich in traditional skills, crafts and entrepreneurial talent. **Women's Self-Help Groups (SHGs) help bring this talent into local economies.** Their products range from handlooms and handicrafts to processed foods and other locally made goods. Yet making a product is only the first step. Rural entrepreneurs also need customers, market information, and opportunities to grow. **SARAS Melas** help bridge this gap by bringing women-led enterprises closer to consumers, buyers, and institutions. Organised by the government under the **Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)**, SARAS Melas have evolved over nearly three decades. They are no longer only exhibitions. They offer a space to sell products, understand consumer preferences, build business connections, and explore wider markets.



Image: SARAS Melas providing a national platform to traditional arts

The National SARAS Mela in **Vijayawada, Andhra Pradesh**, marks a new step in this journey as **it is the first National SARAS Mela to be organised outside the Delhi-NCR region**. The event is running from 13 October 2026 to 31 October 2026 at Punnami Ghat, Vijayawada. Around **1,500** women SHG entrepreneurs and Lakhpati Didis from **34 States and UTs** are showcasing their products through **more than 650 stalls**. The Mela features **regional textiles, handicrafts, natural and processed foods,** and other rural products. An **India Food Court, cultural showcases,** and **dedicated learning spaces** add to the experience.

The **decentralisation of the National SARAS Mela** reflects a wider development approach: taking national platforms closer to producers and consumers across India. It connects local skills with new markets while supporting the growth of women-led enterprises. This event paves the way for further decentralisation of other national events and is in line with the approach of conducting international events like BRICS and G20 meetings at regional levels.

From Rural Livelihoods to Market Access: The Role of DAY-NRLM

DAY-NRLM is the government's flagship programme for reducing rural poverty and promoting women's economic empowerment. It works through SHGs and their federations, while **supporting financial inclusion and sustainable livelihoods.** The Mission helps women access skills, finance, technology and livelihood opportunities. It also strengthens the market ecosystem around women-led enterprises through product visibility, branding and links with physical, digital and institutional markets.



Image: SHG women receive branding and marketing knowledge under DAY-NRLM

This market connection matters because enterprise growth depends on more than production. Women need opportunities to sell beyond their immediate communities. They also benefit from feedback, better product presentation, and connections with buyers. SARAS Melas provide a practical bridge between these needs and market opportunities. They bring SHG enterprises, consumers, institutional buyers and other stakeholders together. Entrepreneurs can sell directly, study customer preferences and explore partnerships that may continue after the event.

From 65 Beneficiaries to a National Marketplace

The SARAS journey began in **1999,** when the first National SARAS Mela was organised in Delhi with around **65 beneficiaries.** Since then, the platform has expanded to **national, regional, state** and **district** levels. As on date, a total of **117 National SARAS Melas** and **annual sales exceeding ₹200 crore** have been recorded. States and Union Territories also organise a minimum of two State-level SARAS Melas a year, bringing the **national average to around 50 events annually**. Regional and district-level events bring selling opportunities closer to local producers. Together, these formats support market discovery, branding, buyer–seller linkages and enterprise development.

Lakhpati Didi: Making Livelihoods More Sustainable

The Lakhpati Didi initiative is an outcome-oriented livelihood initiative under DAY-NRLM. It builds on the network of women organised through SHGs and their federations. Its focus is to help women and their households achieve sustainable income through diversified livelihood opportunities. **A Lakhpati Didi is an SHG member whose household earns at least ₹1 lakh annually on a sustainable basis.** The assessment covers at least four agricultural seasons and/or business cycles. The initiative received national impetus in **August 2023**, when the government announced an ambition to create **two crore Lakhpati Didis**. The **target was raised to three crore** in the **Interim Budget 2024-25.** Subsequently, the initiative achieved the **three-crore milestone by December 2025.**

In **February 2026**, the government announced an **enhanced target of six crore Lakhpati Didis.** This next phase places greater importance on **sustaining income gains** and helping enterprises grow. Market access, product visibility, branding, and reliable sales channels are important to this effort. SARAS Melas support this transition from livelihood creation to enterprise growth. They can also create opportunities for bulk orders, institutional sales, and longer-term market connections. The Vijayawada Mela brings this connection to life through dedicated spaces for successful entrepreneurs, business learning, and institutional support. Women can share their experience, learn new practices, and explore ways to strengthen their enterprises.

Vijayawada: A National Marketplace with a Regional Reach

The Vijayawada Mela brings products and traditions from across India into one marketplace. Visitors can explore Phulkari from Punjab, Pashmina from Jammu and Kashmir, Ikat and Telia textiles from Telangana, and Paunchei from Mizoram. The stalls also feature Meenakari, Dokra, brasswork, woodcraft and traditional paintings.

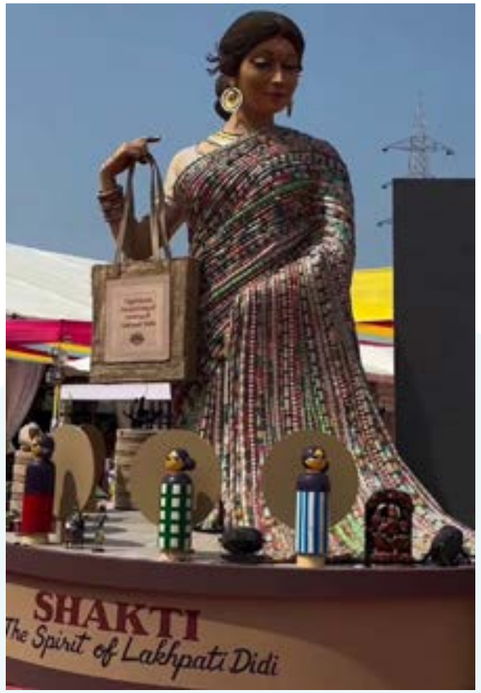


Image: The 16-feet tall installation: "SHAKTI"

A 16-foot installation titled **"SHAKTI - The Spirit of Lakhpati Didi"** forms a signature feature of this Mela. It symbolises the **collective strength of women who preserve traditional craftsmanship** and turn their skills into livelihoods, independence and prosperity.

The Mela is supported by government partners, including the **National Bank for Agriculture and Rural Development** (NABARD) and the **National Institute of Rural Development and Panchayati Raj** (NIRDPR). Its design combines direct sales with learning, demonstrations, and connections to institutions. The aim is to make the event useful not only for visitors, but also for the entrepreneurs seeking to build sustainable businesses.

Spaces That Connect Products, Skills and Opportunity

The Vijayawada National SARAS Mela is going beyond a conventional exhibition and retail format by creating a series of **dedicated thematic, knowledge and engagement spaces.** These spaces are providing opportunities for enterprise showcasing, peer learning, knowledge exchange, convergence with government and market stakeholders, live demonstrations, and structured buyer–seller interactions.

Lakhpati Didi Pavilion: Learning from Enterprise Journeys

The Lakhpati Didi Pavilion showcases women who have built successful enterprises. It features entrepreneurs **earning more than ₹10 lakh annually, including women earning over ₹1 crore.** These women share their journeys, products, business models, and market strategies with other SHG members. Their stories highlight different routes to enterprise growth, including agriculture, non-farm livelihoods, food processing, handicrafts, handlooms and services. Peer learning can help women identify approaches suited to their own skills and circumstances.

Learning and Knowledge Pavilion: Building Business Skills

Strong products need strong business practices. The Learning and Knowledge Pavilion is designed for **workshops, expert talks, masterclasses and experience-sharing sessions** among SHG entrepreneurs, State Rural Livelihood Missions (SRLMs), buyers and other stakeholders. Topics include packaging, branding, preparing business proposals, e-commerce and social media marketing. Further, engagement with public institutions and **private-sector organisations** is also encouraged. These include NABARD, FICCI, CII, ITC, Hindustan Unilever, Amazon and Flipkart. Such interactions can expose entrepreneurs to practical tools for improving product presentation and reaching customers.

Convergence Pavilion: Connecting Women with Support

Growing an enterprise often requires more than market access. Entrepreneurs also need credit, skills, technology, quality certification, and government support. The Convergence Pavilion brings SHG entrepreneurs together with **relevant departments, financial institutions, development agencies and technical institutions.** These organisations and platforms include the Ministry of Tribal Affairs, Ministry of Micro, Small & Medium Enterprises, Ministry of Textiles, ONDC, Government eMarketplace (GeM) and TRIFED. The pavilion is intended to help women understand relevant schemes, services and support systems.

Demonstration Pavilion: Showing How Products Are Made

A finished product often carries a story of skill, time and technique. The Demonstration Pavilion lets visitors see that process directly. Women entrepreneurs and artisans are **demonstrating live** traditional and contemporary production methods. These activities include **pottery, needlework, and mirror-work embroidery.** Live demonstrations by the Lakhpati Didis create opportunities for practical learning and knowledge exchange. They also help visitors appreciate the craftsmanship behind handmade products, and the **"Demo and Live Learning Area"** offers a special experience.



Image: Live fibre-making demonstration

India Food Court: Regional Flavours and Women's Enterprise

Food is another route through which rural enterprise reaches consumers. The India Food Court features **50 food stalls** showcasing regional cuisines being prepared in traditional ways using pure spices. The event brings together **more than 200 first-generation women food-service entrepreneurs** from over 28 states and UTs. Visitors can explore street favourites such as Gol Gappe, Chaat and Kebabs. Regional dishes include Litti Chokha from Bihar, Hyderabadi Dum Biryani, Mushroom Pitha from Assam, and Makke Di Roti with Saag from Punjab. Other examples include Vana Sundari from Attappadi in Kerala and Chausela from Chhattisgarh. The food court gives women an opportunity to present regional culinary traditions in a national setting. It also brings the business of food preparation and service into the wider story of women-led entrepreneurship.



Image: Regional delicacies being served at the Food Court

Cultural Showcases: Celebrating India's Diversity

Cultural programmes feature **traditional art forms, crafts, textiles, music and dance** from participating regions, creating an immersive national experience for visitors. These showcases celebrate the heritage behind many of the products on display. They also facilitate participating states in presenting their distinct cultural identities.

Digital Integration: From Physical Stalls to Digital Markets

Digital payments are an important catalyst for business activities at the SARAS Mela. **UPI transactions** support convenient and transparent payments, and the food court primarily operates through cashless transactions. At the same time, keeping in view the convenience of elderly citizens and visitors who may prefer cash payments, **coupon-based cash payment facilities** are also available, ensuring an inclusive and seamless experience for all.



Image: The eSARAS website

Further, a market opportunity should not end when a Mela closes. Digital channels can help enterprises reach customers beyond the event and across geographical boundaries. The SARAS ecosystem, therefore, combines physical Melas with the **SARAS Gallery and e-commerce channels.** The eSARAS platform provides an online route for customers to discover and purchase products made by SHG entrepreneurs. This extends the market-access approach beyond face-to-face sales and can help products remain visible after the Mela.

A dedicated SARAS Mela Digital App was introduced in **2025**. It supports SHG nominations, attendance management, and the sharing of event-related information. Together, physical events and digital channels offer complementary routes to market. The SARAS Mela creates direct contact with customers and buyers. Online channels can help extend product discovery and sales beyond the event.

Taking National Market Access to the Regions

The Vijayawada National SARAS Mela represents an expansion of the market-access platform into a new region. Organising national events in different locations can bring them closer to local consumers, buyers and institutional partners. It can also help producers from different States gain exposure to wider markets. This approach supports the broader objectives of DAY-NRLM and the Lakhpati Didi initiative. Women need sustainable livelihoods, but they also need ways to improve product value and expand sales. Platforms that combine selling, learning, and institutional connections can contribute to that process.

This National SARAS Mela (outside the Delhi NCR region) is a landmark initiative taken by the Government during the SEVA Pakhwada beginning from 2nd October 2026. SARAS Melas also promote the vision of **Vocal for Local** and **Atmanirbhar Bharat.** They give consumers a direct way to discover rural products and meet the women entrepreneurs behind them. They create opportunities to preserve traditional skills while strengthening women-led enterprises. At its heart, the National SARAS Mela is about the **women behind every product, craft, and enterprise,** and the journey **from skill to enterprise, enterprise to market, and market to sustainable livelihood.**

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Transforming Wastewater Treatment

Technology and Innovation under Namami Gange

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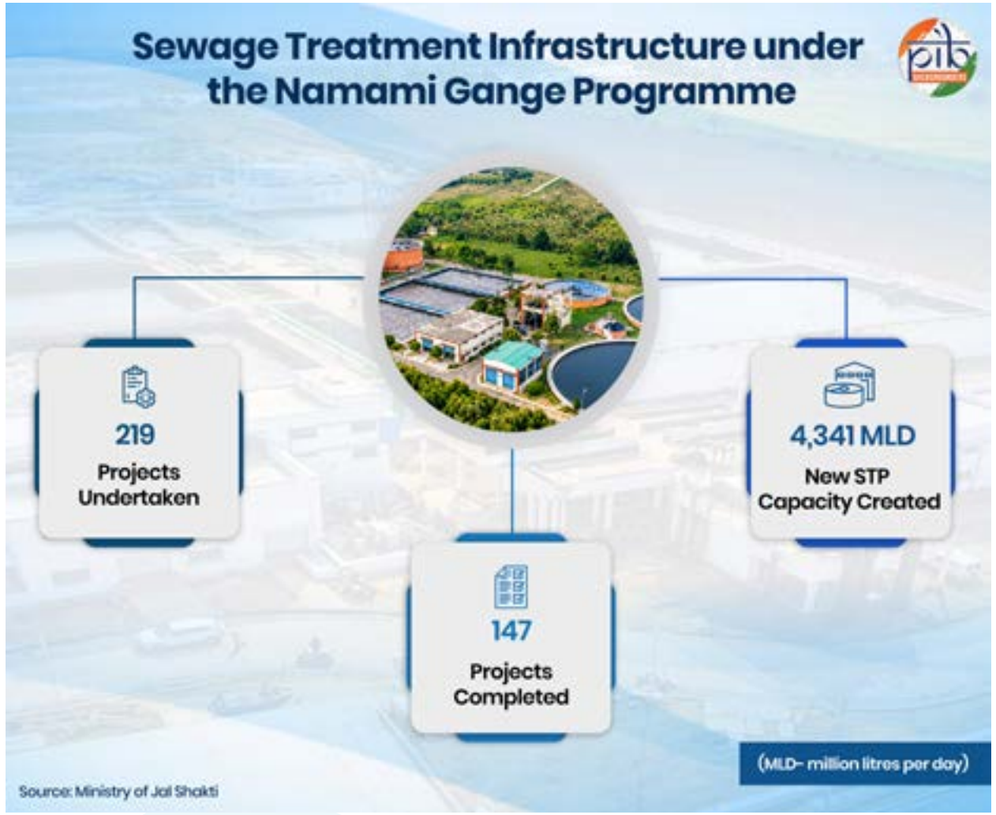
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Wastewater is generated daily through domestic and urban activities. As towns and cities expand, the volume of sewage requiring collection, conveyance and treatment also increases. Effective treatment therefore requires different technological approaches depending on the nature of sewage, local conditions and available infrastructure. In urban areas, sewage flows through underground networks to centralised treatment plants. However, areas without complete sewer networks require solutions for wastewater collected through septic tanks and other on-site systems. Treatment requirements also vary with sewage characteristics, available land, discharge standards and opportunities for treated-water reuse. Addressing these differences needs a combination of conventional treatment systems and innovative technologies suited to specific situations.

This approach shapes the **Namami Gange Programme (NGP),** launched in 2014. It is an Integrated Conservation Mission with the twin objectives of effective abatement of pollution, conservation and rejuvenation of the National River Ganga. **Main pillars** of the Namami Gange Programme are **Sewerage Treatment Infrastructure,** River-Front Development, River-Surface Cleaning, Biodiversity, Afforestation, Public Awareness, Industrial Effluent Monitoring and Ganga Gram.

The programme places **sewage treatment infrastructure** at the centre of its pollution-abatement work. It combines the development of new treatment capacity and the adoption of different treatment technologies. The programme has undertaken **219 projects** worth an estimated ₹35,664 crore, of which **147** have been completed. It records interventions across 10 Ganga basin states, including development of 6,603 MLD of sewage treatment plant (STP) capacity, with 4,341 MLD created. These efforts expand treatment capacity while improving the performance of existing infrastructure.





Namami Gange's Technology-Neutral Approach

The Namami Gange Programme follows a technology-neutral approach, selecting sewage treatment processes according to local requirements. Adopted technologies include the Conventional Activated Sludge Process, Upflow Anaerobic Sludge Blanket (and its combinations with aerated lagoons), Sequential Batch Reactor, Moving Bed Biofilm Reactor, Fluidized Aerated Bed, and Food Chain Reactor. Other solutions include electrocoagulation, constructed wetlands and packaged systems such as Johkasou.

This flexibility allows treatment infrastructure to address varied conditions, including large urban centres, small habitations, hilly terrain and land-constrained locations. The programme also incorporates innovations such as NEREDA, Soil Biotechnology, on-site Advanced Oxidation Process-based

treatment, multi-storey STPs and decentralised systems. Faecal sludge and septage management further extends treatment options beyond conventional sewerage networks..

Activated sludge refers to a mass of microorganisms cultivated in the treatment process to break down organic matter into carbon dioxide, water, and other inorganic compounds.

Sequential Batch Reactor is a cyclic activated sludge treatment process which provides the highest treatment efficiency possible in a single-step biological process.

Food Chain Reactor and Electrocoagulation

Food Chain Reactor (FCR) technology was introduced in India through the NGP. It improves upon the Activated Sludge Process and Sequential Batch Reactor by incorporating fixed artificial media and plant roots. Its advantages include a smaller footprint, lower power consumption and nutrient removal. The programme records **five operational FCR-based STPs:** two at Bhatpara, West Bengal and three at Prayagraj, Uttar Pradesh. Another plant at Bhagalpur in Bihar is under construction, with an approximate area of 175 square metres per MLD.



Food Chain Reactor

Electrocoagulation and electro-oxidation represent another treatment approach introduced through the programme. Electrocoagulation is a **non-biological treatment process** that uses electric current and a coagulant metal anode to destabilise suspended and emulsified pollutants. These systems are suited to cold temperatures, hilly terrain and locations with limited access. Such systems have been implemented in Uttarakhand at locations like Badrinath and Chamoli, with **17 installations** recorded. These include a 0.05 MLD STP at Police Chowki, a 1.19 MLD plant at Vivekanand Colony and a 1.25 MLD plant at Pokhari Bend. These systems can therefore extend treatment infrastructure to locations where conventional approaches may be difficult to implement.



Electrocoagulation Technology Applied in Uttarakhand

Onsite Treatment and Multi-Storey STPs

The programme has also explored treatment solutions that can work closer to the source of wastewater. An **Advanced Oxidation Process**-based pilot at Varanasi's Assi Drain was designed to treat excess wastewater onsite, avoiding long interception and diversion sewer lines. The approach uses systems with minimum civil infrastructure and faster execution. Treatment intends to improve water quality, increase dissolved oxygen, and eliminate odour. The model has an innovative financing arrangement. It links payments to the quantity of treated water and achievement of key performance indicators, with no upfront capital payment. This arrangement connects remuneration with treatment



Multi-Storey Sewage Treatment Plant at Muni Ki Reti

performance while allowing freedom in design and configuration.

Another example is the multi-storey sewage treatment plant at Muni Ki Reti, Chandreshwar Nagar. It is the **country's first four-storey STP** for a municipality built under the NGP. Limited land, three sewage drains, a stormwater drain and the site's location upstream of Rishikesh's Triveni Ghat made conventional construction challenging. The **7.5 MLD** plant occupies approximately **900 square metres,** using vertical construction to overcome space constraints. Its land requirement is around 120 square metres per MLD with biological nutrient removal, compared with 400 square metres per MLD for the cited conventional alternative. These examples show how treatment design can adapt to site conditions while meeting wastewater-management requirements.

Nature-Based and Decentralised Treatment Solutions

Not every settlement requires the same scale of sewerage infrastructure. In smaller habitations, conventional networks and sewage treatment plants can be expensive, while limited land creates additional challenges. Under NGP, decentralised and nature-based solutions offer alternatives suited to such locations. **Constructed wetlands (CWs)** are engineered systems that use natural processes to remove pollutants under



Constructed Wetland Treatment

controlled conditions. A CW system comprises water, plants, growing media (substrate), soil and microorganisms.

Bithoor in Uttar Pradesh demonstrates this approach. With a population of approximately 20,000, the Nagar Panchayat faced high costs for conventional sewerage infrastructure and a lack of suitable land for an STP. Constructed wetlands were selected following third-party appraisal as an emerging treatment technology. Six wetlands were developed directly on drains, providing in-situ treatment for approximately 2 MLD. This resulted in declining Biochemical Oxygen Demand (BOD) levels from around **75 mg/l** at the inlet to below **10 mg/l** in treated effluent. The technology is considered suitable for drains carrying small, dilute flows where sufficient length and width are available.

Johkasou provides another decentralised option for sewage treatment. It is a packaged treatment facility capable of treating domestic sewage to the desired regulatory and National Green Tribunal (NGT) norms. The system combines several sewage-treatment processes within a prefabricated, plug-and-play unit. Johkasou-based decentralised sewage treatment plants can be useful for low-flow applications, locations where civil construction is difficult and sites with limited space. It also includes locations where systems can be constructed underground. The systems have been used at multiple locations in Uttarakhand, with six installations recorded.

The systems reduce the need for full-time operators and daily sludge handling at the site. Multiple configurations, including cylinder-type and capsule-type options, cater to different flow requirements. Depending on the configuration, the treatment process includes screening, primary treatment, biological treatment, secondary settling, recirculation, disinfection and filtration. These features make Johkasou relevant to settlements where traditional sewerage infrastructure is difficult to build or supervise. Its use in Uttarakhand reflects the need to adapt decentralised sanitation solutions to local geography.

NEREDA: Efficient Biological Treatment

NEREDA is another biological wastewater treatment technology introduced through the NGP which uses aerobic granular sludge. It uses the same bacteria as conventional activated sludge but forms compact aerobic granules with good settling properties. The technology offers a smaller



NEREDA Reactor

footprint, lower construction costs and reduced operating expenditure. It has also demonstrated **power savings of approximately 50%** compared with the Activated Sludge Process and 20% compared with the Sequential Batch Reactor (SBR).

A **60 MLD** NEREDA-based STP at Pahadi Patna represents these advantages. Its bioreactor occupies approximately **1,900 square metres,** compared with 5,400 square metres for the cited SBR bioreactor requirement. NEREDA shows how advanced biological treatment can reduce space and energy requirements in larger installations**.**

Soil Biotechnology and Faecal Sludge & Septage Management

Soil Biotechnology provides a natural-treatment approach under the programme. This terrestrial wastewater-treatment system combines physical processes such as sedimentation and infiltration with biochemical processes. This removes suspended solids and organic and inorganic contents from wastewater. The system uses a suitable mineral constitution, native microflora, and bio-indicator plants as key components.

Also described as a Constructed Soil Filter, it can be built using Reinforced Cement Concrete (RCC), stone masonry, or soil bunds. Its elements include a raw-water tank, bioreactor containment, treated-water tank, piping and pumps. Depending on the desired water quality, the process can operate as a single-stage or multistage system. The approach minimises mechanical or moving equipment and facilitates easier operation. At Devprayag, a **1.2 MLD** Soil Biotechnology-based STP was constructed, with effluent standards based on NGT parameters.

Faecal Sludge and Septage Management addresses another part of the sanitation chain. At Chunar, Uttar Pradesh, a **10 kilolitres per day (KLD)** Faecal Sludge Treatment Plant (FSTP) pilot was sanctioned at a construction cost of ₹2.70 crore. Conventional interception and diversion networks and an STP were considered unfeasible due to high costs for the small habitation. Septic tanks and soak pits were prevalent, while drain flows remained low and some drains dried up. Following third-party appraisal, constructed wetlands or other nature-based solutions were identified as more suitable.



Soil Biotechnology-based STP at Devprayag

An FSTP does not replace an STP, as it treats periodic septage generated from soak pits. Co-processing enables septage from unconnected areas to enter the wider treatment system. It involves a receiving station for septage tankers and transferring the collected material into the network for treatment alongside city sewage.



Faecal Sludge and Septage Management

Energy Recovery, Sludge Management and Resource Use

Under Namami Gange, interventions focus on sludge management, energy recovery and reducing operational and resource requirements. Biogas generation through anaerobic digestion of sludge offers an opportunity for energy recovery. Anaerobic Digestion is the biological degradation of organic matter in the absence of oxygen. The biogas can be used for power generation. Varanasi's **140 MLD Dinapur STP** records an actual flow of approximately **110 MLD** and actual total power consumption of **4,20,000 units** per month. Biogas-based generation reached around **2,20,000–3,00,000 units** monthly, representing approximately **52% to 72%.** At the 80 MLD Naini STP in Prayagraj, biogas generation accounted for around Faecal Sludge and Septage Management 50% of daily power consumption. Other

examples include projects at Jajmau in Kanpur and Bhagalpur, while a 220 MLD STP at Meerut is identified for Bio-CNG generation.

Sludge dewatering also contributes to operational efficiency. Dewatering is the separation of solids and

liquids to increase the solid content of sludge by removing a portion of the liquid fraction. Volute Press (asludge-dewatering device) was introduced at the 50 MLD Ramana STP to meet guaranteed energy-consumption and land requirements. Its energy efficiency and compact footprint have prompted consideration of replication. Together, these interventions extend wastewater management beyond pollutant removal to include residual sludge treatment and more efficient plant operation.

Green STPs: Energy Efficiency and Sustainable Operation

The long-term performance of sewage treatment plants depends on treatment standards, efficient operation and sustainable resource use. Under Namami Gange, several initiatives promote green and energy-efficient STPs.

On-site solar power was initially introduced at the **42 MLD Naini STP** to comply with guaranteed energy consumption. Its **1,000 KW** solar plant generates approximately **3,850 units** daily against a requirement of 5,700 units. At the 80 MLD Naini STP, solar generation contributes around 1,400 units daily, while biogas supplies another 4,500 units against a total requirement of about 8,900 units. Other installations and projects include the 16 MLD Jhunsi and 14 MLD Phaphamau STPs, alongside projects at Bareilly, Bhagwanpur, Vrindavan, Hathras, Shamli and Saharanpur.

A 220 MLD Meerut STP has also been proposed as a Green STP, with **100%** solar power envisaged for the plant and associated facilities. A 10 MW offsite solar plant was being considered by the concessionaire, with electricity supply proposed under the Government of India's Open Access Policy.

Sludge treatment also contributes to sustainability. A sludge incineration pilot at Rishikesh explores thermal stabilisation and volume reduction. Dewatered municipal sludge containing about **20% solids** can be dried to around **90%**



Onsite Solar Power at an STP

solids using hot air. The dried sludge is then oxidised in a hot-air generator. The resulting dry ash is not bio-manure, but stabilised ash can be considered for making fire bricks or concrete. At Muni Ki Reti, the pilot was intended to address sludge disposal challenges arising from limited land availability. Together, these efforts combine renewable energy, efficient equipment and improved sludge management to strengthen the environmental and operational sustainability of STPs.



Sludge Treatment at Muni Ki Reti

Rehabilitation, Trunk Sewers and Long-Term Performance

Creating new treatment capacity must be complemented by rehabilitating existing STPs and trunk sewers. Ageing equipment, non-compliance with treatment standards and missing tertiary-treatment components can necessitate upgrades. Under Namami Gange, rehabilitation works address these issues across multiple locations. Examples include the **80 MLD Naini STP** in Prayagraj, with electro-mechanical works, biogas power and OCEMS. The **130 MLD Jajmau STP** in Kanpur received civil and electro-mechanical rehabilitation, biogas power, chlorination and OCEMS.

Trunk sewer rehabilitation is similarly critical as it addresses siltation, damage and punctures in ageing networks. In Varanasi, a 7-km old brick trunk sewer, up to 2,400 mm in diameter, was taken up using a Glass Reinforced Pipe liner. In Kanpur, 9.3 km of old brick trunk sewer, up to 2,250 mm in diameter, was taken up using Machine Wound Spiral Lining.

The programme also uses the **Hybrid Annuity Model (HAM)- based Public-Private** Partnership (PPP) and One City/ Cluster–One Operator model to integrate new and existing sewage infrastructure. Construction-linked payments are combined with performance-linked payments over **15 years,** promoting accountability and sustained operation. Under this model, 31 projects covering 1,955 MLD were taken up. Of these, 11 projects covering **454 MLD** have been completed, while 6 projects covering **235 MLD** are in an advanced stage of

completion. The focus on rehabilitation, operation and maintenance makes wastewater treatment a continuing service rather than a one-time infrastructure activity.

From Sewage Treatment to Sustainable Wastewater Management

Namami Gange's approach to wastewater treatment combines infrastructure, diverse technologies, decentralised solutions, rehabilitation and long-term operation. Conventional and advanced treatment processes, nature-based systems and emerging technologies address varied local requirements. Performance-based operational models, resource recovery, energy efficiency, sludge management and treated-water reuse strengthen the overall treatment framework. Ultimately, the objective extends beyond building STPs to creating sustainable wastewater-management systems that ensure effective treatment, reliable performance and resource recovery across the river basin.

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PM E-DRIVE Scheme

A Step Towards a Sustainable Future

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Electric mobility is gathering pace, driven by targeted policies, financial incentives and supportive measures. At the centre of this shift is the PM E-DRIVE Scheme, launched in September 2024. It aims to accelerate EV adoption, expand charging infrastructure and strengthen the domestic EV manufacturing ecosystem. With an outlay of ₹11,900 crore and implementation extended until March 2028, the scheme supports multiple EV categories and infrastructure. It supports incentives for ~28.30 lakh EVs and has enabled 26.59 lakh sales as of June 2026. The scheme also supports e-buses, charging stations and testing facilities, advancing cleaner, sustainable mobility across India.

India's Shift Towards Electric Mobility

The country is rapidly transitioning towards electric mobility, with electric vehicle (EV) adoption gaining significant momentum. This is being reinforced through targeted policies, financial incentives and mission-driven initiatives. At the centre of these efforts is the **PM Electric Drive Revolution in Innovative Vehicle Enhancement Scheme (PM E-DRIVE Scheme)**. Implemented from October 2024, it supports faster EV adoption through **upfront purchase incentives** and the **development of charging infrastructure**. By promoting sustainability, the scheme also seeks to **reduce transport-related environmental impacts** and improve air quality.

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Breaking Down PM E-DRIVE Scheme

The PM E-DRIVE Scheme is implemented on a pan-India basis. Originally notified for a two-year period, the Scheme has been extended to **31 March 2028**.

- The Scheme has a total outlay of ₹11,900 crore.
- It provides **demand incentives** and **infrastructure support** across various vehicle categories and associated components.
  - The categories covered include **e-2 Wheelers** (e-2Ws), **e-3 Wheelers** (e-3Ws) including registered e-rickshaws & e-carts and L5, **e-Ambulances**, **e-Trucks**, **e-Buses**, **charging infra**, and **upgradation of testing agencies**.
  - Registered e-2Ws receive an **incentive of ₹2,500/kWh** (capped at ₹5,000 per vehicle). This applies to vehicles priced up to ₹1.5 lakh ex-factory, with a **total fund allocation of ₹2,767 crore**. The scheme aims to support 45.79+ lakh registered e-2Ws.
  - Target sales for the sub-component registered e-3W (L5) have been achieved, and the segment was closed on 26 December 2025.
  - Support for e-3Ws (e-rickshaws and e-carts) continues until March 2028.





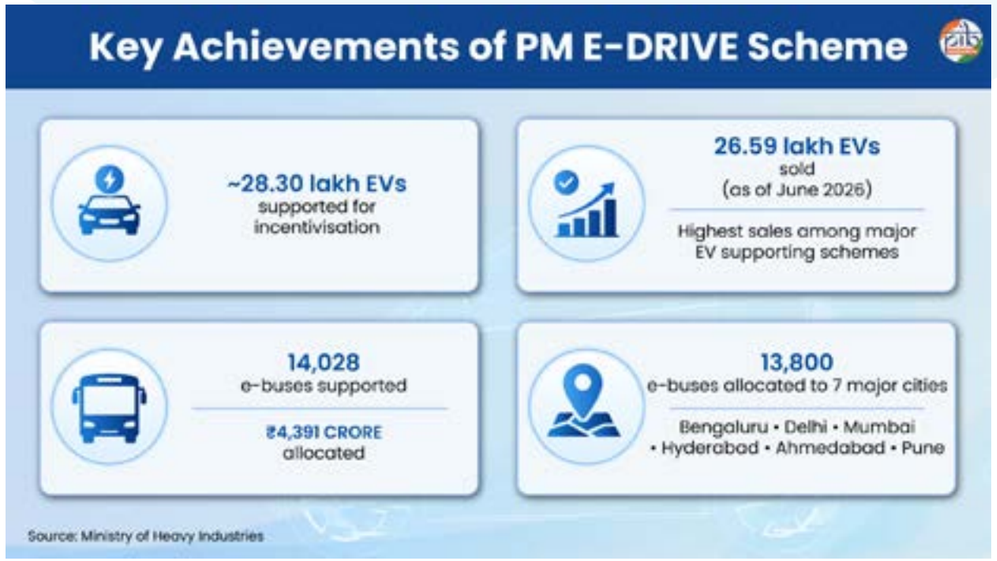
Digital incentive delivery via PM E-DRIVE

e-Vouchers are available under the Scheme to streamline the EV purchase process and facilitate demand incentives for customers. The Scheme portal generates an Aadhaar Face-authenticated e-KYC e-Voucher at the time of purchase. A download link is sent to the customer's registered mobile number. The buyer signs the e-Voucher and submits it to the dealer to avail the demand incentive under the scheme. The dealer then signs and uploads the e-Voucher on the PM E-DRIVE portal.

Key Achievements of PM E-DRIVE Scheme

- PM E-DRIVE supports incentivization of approximately ~28.30 lakh EVs.
- **26.59 lakh EVs have been sold** (as of June 2026).
- ₹4,391 crore has been allocated for the deployment of 14,028 e-buses under PM E-DRIVE. Of these, 14,000 e-buses have been allocated (as of August 2026).
  - » **13,800** e-buses have been allocated to seven cities — **Delhi**, **Bengaluru**, **Hyderabad**, **Mumbai**, **Ahmedabad**, **Pune** and **Surat**.
- Grant support is also available for **EV public charging stations (EV PCS)** and **upgradation of testing agencies**.
  - » ₹2,000 crore has been earmarked for nationwide EV PCS across India.
  - » ₹851 crore has been approved for deployment of 8147 chargers to 3 oil marketing companies and 10 states (as of 28 September 2026).
  - » ₹780 crore has been allocated for modernization and upgradation of vehicle testing agencies.





Impact Across the EV Ecosystem

Government support under PM E-DRIVE is supporting wider EV adoption, cleaner mobility and the development of India's EV manufacturing ecosystem.

For Buyers

- Upfront demand incentives **reduce the purchase price of eligible EVs**, helping lower the initial cost of electric mobility.
- E-vouchers enable eligible buyers to receive the demand incentive as an **upfront reduction in the purchase price**, with the amount subsequently reimbursed to the Original Equipment Manufacturer (OEM) by the Ministry of Heavy Industries.

For Cities

- The Scheme supports the transition towards **cleaner and more sustainable mobility** through electric buses and other EV categories.

For Industry

- PM E-DRIVE supports the development of India's **domestic EV manufacturing ecosystem** and promotes localisation of EV models.
- OEMs registered under the scheme have localised their EV models and obtained **certificates of compliance with the Phased Manufacturing Programme (PMP)** from MHI testing agencies.
- The scheme provides **₹780 crore for modernisation and upgradation of vehicle testing agencies**, equipping them with new and emerging technologies.

Towards a Cleaner Mobility Future

PM E-DRIVE is helping address environmental and energy security challenges while accelerating sustainable mobility. By supporting EV adoption and charging infrastructure, the scheme **strengthens India's transition towards cleaner and more sustainable transportation**.

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Immersive Technologies

Blending physical and virtual worlds

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Immersive technologies are expanding across India's education, industry and creative sectors. The Ministry of Information and Broadcasting is promoting the Animation, Visual Effects, Gaming, Comics and Extended Reality (AVGC-XR) ecosystem through initiatives such as the **Indian Institute of Creative Technologies (IICT)** in Mumbai. Established as a National Centre of Excellence, IICT collaborates with global technology companies, including Google, Meta, Adobe and Netflix, to strengthen creative education, skills and innovation. Further supporting this ecosystem, the **Union Budget 2026–27 allocated ₹250 crore** for AVGC Content Creator Labs in 15,000 secondary schools and 500 colleges across India.

From Digital to Immersive: India's Next Leap

Over the last decade, India has built a strong digital ecosystem that has transformed everyday interactions with technology. Platforms such as **UPI, Aadhaar, DigiLocker, UMANG and BHASHINI** have expanded access to services and information. As digital platforms become more widespread, the next opportunity is to make these interactions more **interactive, visual and experiential.** Rapid advances in Artificial Intelligence, high-speed connectivity and computing are enabling this shift from simply accessing digital services to experiencing them. *Click to Read More: India's Digital Public Infrastructure* and *Transforming India with AI*

This emerging phase is being shaped by **immersive technologies,** which bring digital content closer to the way people experience the physical world. **Virtual Reality, Augmented Reality, Mixed Reality and 360-degree experiences** can create interactive environments and enable users to engage with digital content in new ways. These capabilities can transform education through virtual simulations, healthcare through immersive training, and tourism through virtual exploration. They can also create more engaging experiences across **culture, gaming, entertainment, retail and other sectors.** In doing so, immersive technologies can expand the impact of India's existing digital ecosystem beyond conventional screen-based interactions.

The scale of this opportunity is reflected in India's rapidly growing immersive technology market. The market generated **USD 1,259.5 million in revenue in 2023** and is projected to reach **USD 7,818.7 million by 2030,** growing at a **CAGR of 29.8 per cent.** India is projected to be



the **fastest-growing regional market in Asia Pacific,** supported by its digital ecosystem, expanding middle class and rising e-commerce adoption. This growth presents an opportunity for India to move beyond being a large market and emerge as a **global hub for immersive technology.** Building capabilities in research, startups, talent, content and indigenous technologies can help India shape the next generation of immersive experiences and strengthen its position in the global digital economy.

Understanding Immersive Technologies

Immersive technologies are an emerging suite of technologies that create interactive, engaging and realistic digital experiences. Immersive technologies can combine the **physical and digital worlds.** They enable users to interact with digital content in ways that feel more natural and experiential. Users can interact with digital objects and respond to simulated situations. Unlike conventional digital media, these technologies can engage multiple senses and create a stronger sense of presence. For example, a student can explore a virtual laboratory instead of only viewing diagrams on a screen. Similarly, a tourist can virtually explore a heritage site before visiting it physically. The three most common forms of immersive technology are Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Collectively, these technologies are often referred to as Extended Reality (XR).





Extended Reality (XR)

Extended Reality (XR) refers to technologies that combine real and digital environments through computer systems and wearable devices. It creates different levels of interaction between people and digital content. XR includes Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR).

- **Virtual Reality (VR)** creates a completely digital environment that surrounds the user. It mainly engages sight and sound to create a strong sense of presence. Users can explore and interact with this simulated environment using specialised devices.
- **Augmented Reality (AR)** adds digital information to the user's existing physical surroundings. It can engage sight and sound, while keeping the real-world environment visible. For example, AR can display directions, information or digital objects over the physical world.
- **Mixed Reality (MR)** combines the physical and digital worlds in an interactive environment. It can engage sight and sound, while allowing digital objects to interact with physical surroundings. Users can see and interact with digital objects as if they were part of the real environment.

Other related tech, such as **360-degree video** and **Haptic Technology,** also form part of the wider immersive technology ecosystem. 360-degree video allows users to view a scene in every direction. Users can change their viewing direction and explore different parts of the recorded environment. Haptic Technology uses vibrations, pressure or other physical sensations to provide touch-based feedback. It can make digital interactions feel more realistic by simulating physical sensations during virtual or interactive experiences.

Stepping Into the Experience: How India Is Using Immersive Technology

Education

Researchers at **IIT Madras are developing AR/VR-enabled learning solutions for rural schools.** The initiative uses digital technologies to improve teaching and learning for secondary school students. It aims to create **immersive, VR-based learning environments** where students can explore subjects such as history, social science, science and languages through interactive experiences.

These technologies can make classroom learning more engaging. For example, an AR-based mobile application could bring 500 years of Indian history to life through animated photographs, interactive maps and archival documents. Similarly, VR simulations could allow students to explore the solar system or study the human body through three-dimensional models. By making abstract concepts easier to visualise and understand, these approaches can enrich learning and help students prepare for higher education.

Heritage and Tourism

The Government is using **Extended Reality (XR)** and other digital technologies to make India's cultural heritage more accessible and engaging. The Ministry of Culture has adopted digital tools to improve visitor experiences and preserve information about museum collections. One such tool is **JATAN software,** which helps digitise museum artefacts and their records. So far, eight national-level museums and two Archaeological Survey of India (ASI)

museums have been digitised using JATAN. Their collections are accessible through the **Museums of India** digital repository, enabling people to explore India's heritage online.

Building on this digital foundation, museums are also introducing interactive experiences for visitors. The Indian Museum in Kolkata has introduced AI-based interactive features and AR tools to enrich gallery visits. It has also collaborated with Google Arts & Culture on a virtual exhibition showcasing cultural heritage through digital technology. Similarly, ASI museums at Hampi in Karnataka and Nalanda in Bihar offer mobile-based virtual tours of their collections. These initiatives help visitors explore artefacts digitally, making cultural experiences more engaging and accessible beyond the museum premises. *Click for the Virtual Tour of the Indian Museum, Kolkata*

Governance and Infrastructure

Immersive technologies are also shaping how India plans and manages its infrastructure. The Department of Telecommunications launched the **"Sangam: Digital Twin"** initiative, combining digital twin technology with 5G, IoT, and AI for better infrastructure planning. Digital twin mapping is already supporting city planning, as seen in the **Varanasi Urban 3D Spatial Planning project.** By 2035, India aims to build a **National Digital Twin** for major urban centres, creating digital replicas to improve city planning and management.

What is Digital Twin?

A digital twin is a virtual model of a real-world object, system or place. It uses data from the real world to represent conditions and behaviour, helping users monitor situations and test possible changes digitally. For example, a digital twin of a machine can help identify potential faults, while a city model can help planners assess the likely impact of infrastructure projects before implementation. One example is the Mobility Digital Twin showcased by the Department of Telecommunications (DoT) at India Mobile Congress 2025. It uses telecom-derived mobility data to analyse how people travel and move through different areas. Demonstrations in Vasant Kunj and Central Vista in Delhi examined commuting patterns and helped assess metro station catchment areas. In Ayodhya, mobility data was used to study tourist flows, travel modes and stay patterns. These insights can help authorities plan transport links, improve tourism infrastructure and make better-informed decisions before finalising projects.



Creative Economy and Entertainment

Immersive technology is a growing part of India's media and entertainment sector, closely tied to the AVGC-XR framework. India's gaming sector is projected to grow from **$3.8 billion in 2024 to $9.2 billion by FY29, according to an independent report,** reflecting the scale of this emerging economy. National platforms such as the WAVES summit are further showcasing India's creative and immersive media capabilities to a global audience.

Powering Immersive Technology: India's Key Initiatives

Immersive technology is supported through the Government's broader **AVGC-XR framework.** This framework covers Animation, Visual Effects, Gaming, Comics, and Extended Reality. India's policy support for immersive technology comes as part of the larger, unified push, not as a standalone scheme. *Click to Read More: Powering the AVGC-XR Revolution*

AVGC-XR Promotion Task Force

The AVGC Promotion Task Force was constituted by the Ministry of Information and Broadcasting (MIB) in April 2022. It brings together representatives from the **Animation, Visual Effects, Gaming and Comics (AVGC) industry, academia and Government.** The Task Force provides a platform for coordinated efforts to strengthen the sector's growth and development. Its mandate is guided by three key principles. These include **public-private collaboration, inter-ministerial convergence and an integrated approach to sectoral development.**

Indian Institute of Creative Technologies (IICT)

On the Task Force's recommendation, the Government set up a **National Centre of Excellence (NCoE)** to build skilled talent for the AVGC-XR sector. This took shape as the Indian **Institute of Creative Technologies (IICT),** established in 2025. As of March 2026, IICT has introduced 18 courses across various domains of the AVGC-XR sector, with over 135 students enrolled.

GENESIS (Gen-Next Support for Innovative Startups)

To boost the startup ecosystem in Tier-II and Tier-III cities, MeitY approved the GENESIS Scheme. Launched in 2022, it aims to support around 1,600 tech startups over five years. This includes startups working in immersive technologies like AR, VR, and spatial computing. Through the MeitY Startup Hub, the scheme currently supports **84 AR/VR startups.** It also backs **106 incubators** across the country.

AVGC Content Creator Labs

Under the **Union Budget 2026–27,** the Government allocated **₹250 crore** to establish Animation, Visual Effects, Gaming and Comics (AVGC) Content Creator Labs in **15,000 secondary schools and 500 colleges.** The Indian Institute of Creative Technologies (IICT), Mumbai, will serve as the nodal agency for planning, coordinating and implementing the initiative. These labs aim to equip students with practical skills in animation, visual effects, gaming and digital content creation. They will provide opportunities to develop creative ideas and gain hands-on experience using industry-relevant tools and technologies. The initiative seeks to nurture young talent and prepare students for emerging careers in India's growing creative economy.

WaveX

WaveX is a dedicated media-tech startup accelerator and **incubator launched by the MIB.** It supports startups working in AVGC-XR and other emerging media technologies. WaveX aims to help startups strengthen their technologies, develop market-ready solutions and explore global opportunities.

States Leading India's AVGC-XR Growth Story

- **Karnataka's** AVGC-XR Policy 3.0 supports skill development, infrastructure, production grants and financial incentives for AVGC-XR companies. The state also operates the **KITVEN AVGC Fund,** with a ₹20-crore corpus to invest in companies working in AVGC and related sectors.
- **Maharashtra's** AVGC-XR Policy 2025 has a financial plan of ₹3,268 crore and a vision extending to 2050. The policy provides a dedicated framework for expanding the state's AVGC-XR ecosystem through government-backed support and infrastructure.
- **Telangana's 2016 IMAGE Policy** established a dedicated framework for Animation, VFX, Gaming and Comics, anchored by Hyderabad's IMAGE Tower. The ecosystem features 150+ AVGC/VFX companies, 140+ gaming and animation companies, 30,000 direct jobs and 100 startups onboarded through Software Technology Parks of India (STPI)-IMAGE, supported by production infrastructure, training and global cloud access.
- **Tamil Nadu's** AVGC-XR Policy 2026 targets 200+ startups, around 2 lakh jobs and up to 20% of India's AVGC-XR market by 2030. It also provides a support for the "ELCOT Viyan AVGC-XR Centre of Excellence" in Chennai as a hub and spokes at Coimbatore, Madurai, Tiruchirappalli, Salem and Tirunelveli regions over the next three years.
- **Kerala's** AVGC-XR Policy 2024 focuses strongly on building a specialised talent pipeline. It proposes industry-aligned job roles, faculty development and AVGC-XR courses covering VR, AR, gaming, VFX and digital art, from schools through higher education. The mission aims to create 50,000 new jobs in the AVGC-XR industry, by 2029, solidifying Kerala's commitment to fostering a thriving knowledge-based economy.
- **Madhya Pradesh's** AVGC-XR Policy 2025 combines Centres of Excellence, AVGC-XR labs and targeted skilling with investment incentives. The policy also supports capital investment, employment generation, production costs, quality certification and IP creation.
- **Uttar Pradesh** is developing an AVGC-XR Park in Jewar, near Noida International Airport and the proposed International Film City. The park will integrate animation, VFX, gaming, motion capture, virtual production and XR facilities. It aims to attract investment, support startups, create skilled employment and strengthen the state's digital creative economy.
- **Rajasthan** announced its AVGC-XR Policy 2024 in the State Budget 2024-25 to strengthen the animation, VFX, gaming, comics and immersive technology ecosystem. The policy provides production incentives of **up**

to ₹50 lakh for eligible animation/VFX/AR/VR projects and **₹1 crore** for eligible game development.

- **Gujarat** is actively positioning itself as a key AVGC-XR hub through focused government initiatives. The state is in an advanced stage of preparing a comprehensive AVGC-XR policy supporting infrastructure, skilling, and startups. Moreover, the state already has a strong educational base - 16 institutions offering Animation, VFX and Gaming courses - providing a ready talent pipeline.

Way Forward

Immersive technologies represent more than a new entertainment medium. They are a strategic lever for India's creative economy, education system, and cultural preservation. As India strengthens its AVGC-XR ecosystem through coordinated national and state-level efforts, it is well-positioned to become a global hub for immersive content and innovation. This convergence of creativity and cutting-edge technology aligns closely with the vision of Viksit Bharat 2047, where a technologically empowered, self-reliant India leads in emerging sectors.

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Viksit Bharat- G RAM G

Viksit Bharat - Guarantee for Rozgar and Ajeevika Mission (Gramin)

Published on: 24 October 2026

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A New Framework for Rural Employment and Development

Aligned with the vision of **Viksit Bharat @2047**, the **Viksit Bharat - Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G)** marks a significant reform in rural development. **The VB-G RAM G Act, 2025** came into force on **1 July 2026** and has been rolled out successfully across all rural areas of the country. The transition from Mahatma Gandhi NREGA to VB-G RAM G has been seamless and disruption-free. Digital systems supporting implementation were operational from the commencement of the new framework.

The Act provides a statutory guarantee of **125 days of wage employment every financial year.** The guarantee covers every rural household whose adult members volunteer for unskilled manual work. It promotes **empowerment, growth, convergence and saturation** for a prosperous and resilient rural Bharat. It focuses on four thematic areas: **water security, core rural infrastructure, livelihood-related infrastructure and mitigation of extreme weather events.**

The Act institutionalises a **Whole-of-Government approach** through convergence-driven and saturation-oriented planning. At its core is the preparation of **Viksit Gram Panchayat Plans (VGPPs).** These provide an integrated framework for addressing the diverse developmental needs of Gram Panchayats.

Bottom-up Planning Envisaged through VGPPs

Viksit Gram Panchayat Plans (VGPPs) are a key institutional reform under VB-G RAM G. They enable participatory, evidence-based, saturation-oriented, and convergence-driven planning at the grassroots level.

VGPPs put local needs at the centre of rural development planning. They are prepared with the active participation of the Gram Sabha and Gram Panchayat. The Gram Sabha provides due recommendation and approval of the plans. VGPPs enable villages to identify their actual development needs, existing assets and development gaps and prioritise works accordingly.

How the VGPP Process Works

- **Participatory planning:** Gram Panchayats identify and prioritise works based on local needs, with the involvement of the Gram Sabha.
- **Asset mapping:** The process begins with a comprehensive inventory of existing assets, infrastructure and service delivery gaps within the Gram Panchayat.
- **Coverage of existing assets:** The inventory includes assets created under various Central and State Government schemes and programmes.
- **GIS-based planning:** The planning process uses GIS, **Yuktdhara, PM Gati Shakti**, and other digital tools. Geospatial and non-spatial information supports evidence-based and integrated planning based on local needs and existing assets.
- **Gap assessment:** Information from these platforms supports **spatial planning, better asset mapping, and avoidance of duplication.** It also helps identify infrastructure deficits, development priorities, and potential interventions.
- **Convergence across government:** VGPPs promote a **Whole-of-Government approach** by bringing together resources and interventions from different schemes, departments and stakeholders for integrated village development.
- **Multi-level consolidation:** VGPPs are consolidated at the Block, District, State and National levels. The consolidated plans contribute to the **Viksit Bharat National Rural Infrastructure Stack.**
- **Permissible works:** The VGPP Framework identifies **318 types** of permissible works across the four thematic areas.

The VGPP process is intended to support integrated village development through employment-linked asset creation, improved infrastructure and convergence of public interventions.

VB G-RAM G: Progress on the Ground

As of 24 September 2026, VB-G RAM G has recorded significant progress since its implementation on 1 July 2026.

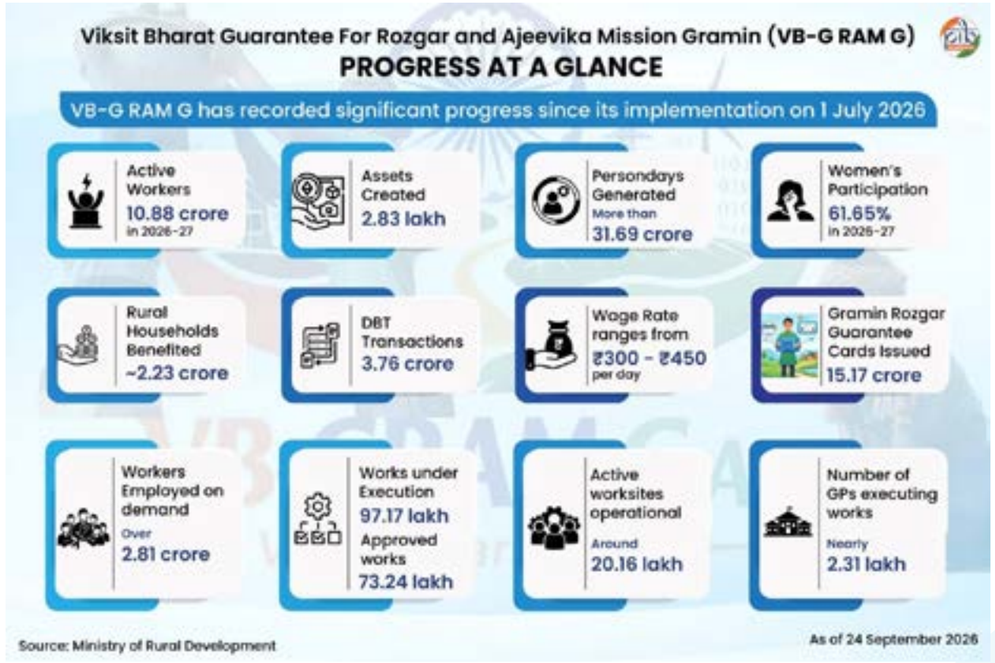
- Active workers: **10.88 crore** in 2026-27
- Assets created: **2.83** lakh
- Person-days generated: **More than 31.69 crore**
- Women's participation: **61.65 percent** in 2026-27
- Employment provided to workers on demand: **Over 2.81 crore** belonging to **about 2.23 crore** rural households
- Works under Execution: **97.17 lakh**
- Approved works readily available to meet future employment demand: **73.24 lakh**
- Active worksites operational: Around **20.16 lakh**
- Number of Gram Panchayats executing works presently across the country: Nearly **2.31 lakh**
- DBT transactions: **3.76 crore** in 2026-27

- Wage rate: Ranges from **Rs.300** to **Rs.450 per day**
- Total number of Gramin Rozgar Guarantee Cards issued: **15.17 crore**

Financial Progress

- A total of **Rs.93,841 crore** has been allocated to States/UTs as interim allocation for FY 2026-27

- Out of this, a Mother Sanction of **Rs.25,880 crore** has been issued as the first instalment to the States/UTs



Technology Enabled Transparency and Governance

Technology is central to VB-G RAM G implementation. Digital systems support worker verification, monitoring, payments, and transparency. They also link employment with sustainable asset creation and rural development.

- **Digital verification:** e-KYC and worker attendance are captured through Face Authentication and biometric authentication. It significantly enhances transparency, accountability, and authenticity.

- **Digital work monitoring:** Geo-tagging, digital measurement, electronic Measurement Books (e-MB) and mobile-based monitoring support monitoring across different stages of implementation.

- **Digital payments:** Direct Benefit Transfer (DBT) supports payments under the framework.

- **Technology-enabled oversight:** Spatial technology-enabled planning, real-time dashboards, and AI-enabled analytics support monitoring, reporting, and corrective action.

- **Digital platforms and capacity building:** Dedicated digital platforms, citizen engagement platforms and large-scale capacity building initiatives further support implementation.

Building Rural Development from the Ground Up

VB-G RAM G brings **employment, participatory planning and rural development** together. Through VGPPs, Gram Panchayats identify local needs, map existing assets and prioritise development works. Technology, convergence and digital systems strengthen implementation, transparency and accountability. The framework links **employment with sustainable asset creation**, supporting resilient livelihoods and integrated rural development.



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BHAVYA: Creating Investment-Ready Manufacturing Ecosystems

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Bharat Audyogik Vikas Yojna (BHAVYA) is a ₹33,660 crore initiative to develop **100 plug-and-play industrial parks** across India. The parks will provide modern industrial infrastructure, reliable services, and faster approvals, reducing the time needed to set up new industries. The scheme aims to **attract investment, support MSMEs, strengthen supply chains, create jobs, and drive industrial growth** across regions.

A New Phase in Manufacturing Policy

India's manufacturing sector is undergoing structural change. It now contributes about **16–17 percent of GDP** and employs **over 27 million workers.** The **National Manufacturing Mission** aims to raise this share to **25 percent by 2035.** The composition of industries is also changing, with medium- and high-technology industries accounting for **46.3% of manufacturing value addition.** This reflects a shift towards higher-value and technology-intensive manufacturing.

As industries grow, they need reliable infrastructure, efficient logistics, and predictable approvals. Global supply chains are also diversifying, making well-connected industrial locations more important.

Plug-and-play parks bring these requirements together by providing essential infrastructure and common facilities before industries begin operations. This reduces the time and cost involved in setting up new manufacturing units. To expand this approach nationwide, the **Bharat Audyogik Vikas Yojna (BHAVYA) was approved by the Cabinet in March 2026** and notified on 10 April 2026 with an outlay of **₹33,660 crore.** BHAVYA is being implemented in partnership with States and private **developers.** The scheme emphasises **increasing manufacturing capacity in the country** and ease of doing business through streamlined approvals, effective single-window systems and investor-friendly reforms. The plug-and-play industrial ecosystems will reduce entry-level barriers and help industries move from investment to production quickly.

Policy Evolution: From Pre-2020 to Plug-and-Play Ecosystems

India's approach to manufacturing growth has evolved over time. Each phase has expanded the country's capacity to support industry and create new economic opportunities.

The first phase focused on **industrial estates** and **Special Economic Zones (SEZs).** These provided industrial land, common infrastructure, and regulatory incentives. As of February 2026, India had 370 notified SEZs. These zones attracted investments worth **₹7.82 lakh crore** and generated employment for over **31.7 lakh people.**

The approach then expanded from individual industrial zones to larger manufacturing hubs across the country. As of 14 October 2026, **4,164 industrial parks** have been mapped on the **India Industrial Land Bank (IILB).** At the same time, the **National Industrial Corridor Development Programme (NICDP)** moved beyond providing industrial land. It combined manufacturing zones with utilities, logistics, and urban services, creating more integrated industrial locations.

Industrial nodes such as **Dholera Special Investment Region (Gujarat), Shendra-Bidkin Industrial Area (Maharashtra), Vikram Udyogpuri (Madhya Pradesh), and Integrated Industrial Township Greater Noida (Uttar Pradesh)** demonstrated the advantages of integrated planning.

Period	Policy Approach	What it Added
Pre-2020	Industrial estates and SEZs	Fiscal incentives; export-oriented regulatory perimeter
NICDP	Smart industrial cities with integrated infrastructure	Planned nodes, multimodal connectivity, plug-and-play pilots
Budget 2026-27	Sector-specific plug-and-play parks (chemical parks, PM MITRA)	Cluster-based model in specific sectors
BHAVYA (2026)	Nationwide rollout: 100 proposed plug-and-play parks nationwide	Scale, coverage, and reform-linked delivery at national level

Inside the BHAVYA Framework

BHAVYA provides financial assistance of up to **₹1 crore per acre** for developing industrial parks. The scheme covers essential **components** such as internal roads, power supply, water networks, drainage systems, common effluent treatment facilities, **value-added** infrastructure and Information & Communication Technology (ICT)-enabled administration. Underground utility corridors will enable a no-dig environment for efficient maintenance and uninterrupted industrial operations.

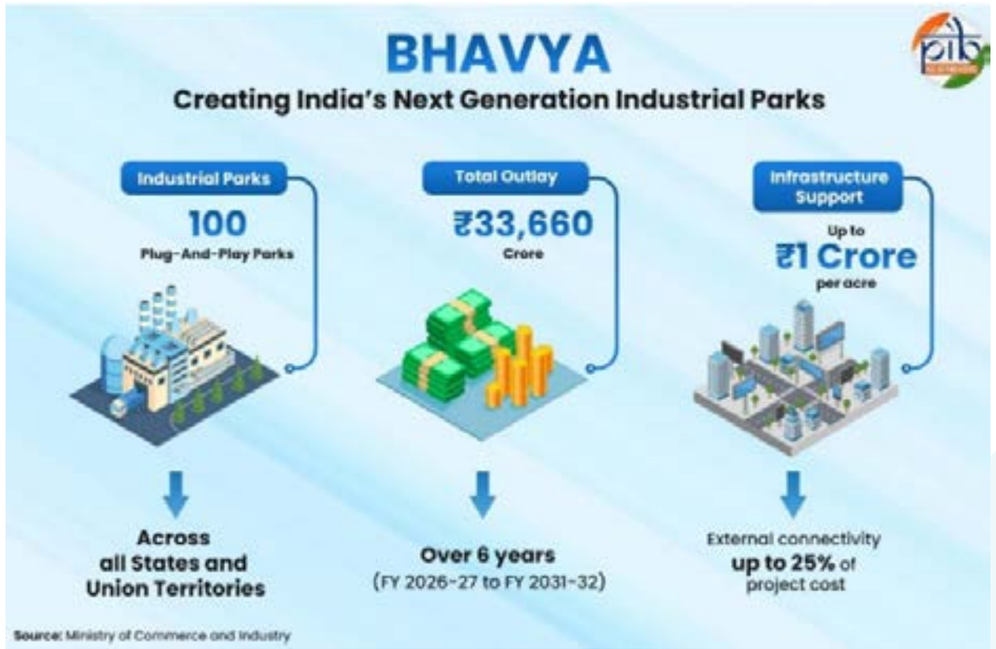
Parks will also feature **ready-built factory sheds, built-to-suit units, testing and certification facilities, and warehousing.** To improve worker welfare and productivity, provisions have been made for **worker** housing, healthcare facilities, skill development centres, and other social amenities. The scheme **supports up to 25% of approved funding to be allocated for external infrastructure such as road, rail, and last-mile logistics connectivity,** ensuring seamless integration with the wider transport network.

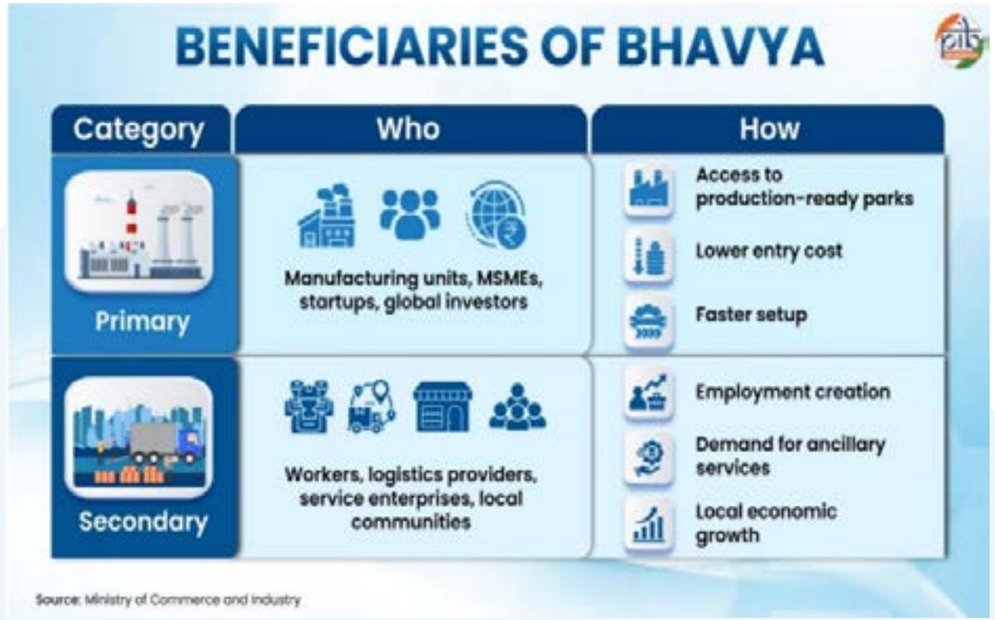
The scheme will be implemented over six years, from **FY2026–27 to FY 2031–32. In the first phase, up to 50 industrial parks will be selected** through a challenge mode across two selection rounds. The remaining parks will be selected in subsequent phases, taking the total number of parks supported under BHAVYA to 100. The selection will consider project readiness, land availability, and industrial potential. Each park will span **25 to 1,000 acres depending upon mandatory criteria of land sizes as per the Scheme guidelines.** Projects will be implemented and managed through dedicated **Special Purpose Vehicles (SPVs),** which will oversee development, operations, investor facilitation, and long-term maintenance.

Manufacturing firms, Micro, Small, and Medium Enterprises (MSMEs), startups, and investors can access common facilities and streamlined approvals under BHAVYA.

In June 2026, **the BHAVYA Portal was launched** for the implementation and monitoring of the scheme. The portal supports project submission, appraisal and evaluation while enabling a transparent and competitive selection process.







Plug and Play Industrial Parks: Concept and Features

Plug-and-play industrial parks are pre-developed industrial ecosystems where land, trunk infrastructure, utilities, and common facilities are made available beforehand. In many cases, approvals and basic clearances are **streamlined through single-window systems.** This allows enterprises to move faster from financial decisions to production, while reducing upfront costs and implementation delays.

Trunk infrastructure is the higher-order infrastructure development with the primary purpose of serving 'catchment' areas to be shared between developments, commonly provided by local governments. It includes the development of the main line of infrastructure, such as water supply, drainage, sewerage/septage, roads, streetlights, electricity, etc.

Such models are becoming more relevant as supply chains diversify across locations and manufacturing becomes more time-sensitive. **Investors increasingly seek locations where land availability, connectivity, utilities, and regulatory processes are predictable.**

The plug-and-play model is already gaining traction in India. In the Union Budget 2025–26, **₹2,500 crore was allocated** for the development of plug-and-play industrial parks. India currently has **260 plug-and-play industrial parks,** reflecting the growing adoption of infrastructure-ready manufacturing ecosystems across sectors and states.

The plug-and-play model is also being extended to sector-specific industrial facilities. In July 2026, the Government approved the **BHAVYA-Rasayan Scheme for three Chemical Parks.** These parks will provide common facilities and environmental safeguards for chemical manufacturing.





Dholera SIR: An Integrated Industrial City

Dholera, Gujarat is emerging as a new-generation industrial city. Wide roads, reliable utilities, digital networks, and modern urban services were planned from the start. Power, water, gas, and drainage systems run through a common underground network, **creating a plug-and-play environment for industries.**

The region is developing as a hub for advanced manufacturing sectors. **Semiconductors, aerospace and defence, solar manufacturing, green hydrogen, biotechnology, and heavy engineering** are among the focused sectors. Strong links to ports, airports, expressways, and the Dedicated Freight Corridor connect Dholera to domestic and global markets. Outcomes include:

- 495 acres allotted across 11 plots
- Investment potential: ₹97,328 crore
- Employment potential: 6,000+ jobs

Land has been allotted for major projects, including Tata Electronics' semiconductor facility and Renew Power solar module manufacturing plant.

Towards a New Manufacturing Ecosystem

India's manufacturing landscape is evolving with greater emphasis on integrated industrial development. The shift from industrial estates to planned manufacturing hubs reflects this changing approach. BHAVYA represents the next step in this transistion. Alongside other initiatives for industrial development, it forms part of India's broader effort to strengthen its manufacturing base and enhance its role in global manufacturing.

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National SC-ST Hub Powering Inclusive Entrepreneurship

Advancing Inclusion through Skills, Markets and Business Growth

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Click here for Hindi

The **National SC-ST Hub (NSSH)** is advancing inclusive entrepreneurship by enabling SC/ST enterprises to build capabilities and access wider market opportunities. Through interventions spanning finance, technology, training, mentoring and market linkages, the scheme addresses key barriers across the enterprise journey. Its focus on public procurement further connects SC/ST-owned MSEs with institutional buyers. With growing beneficiary reach, training support and procurement participation, NSSH is helping create a more competitive MSME ecosystem.

Building an Inclusive Entrepreneurship Ecosystem

Micro, Small and Medium Enterprises (MSMEs) provide an important pathway to entrepreneurship, employment and economic opportunity across India's urban and rural areas. Making these opportunities more inclusive requires enabling entrepreneurs from historically underrepresented communities to participate, compete and grow. In this context, promoting enterprise ownership among **Scheduled Caste (SC) and Scheduled Tribe (ST) communities** is an important priority. Greater access to finance, skills, technology and markets can help broaden their participation in India's MSME ecosystem.



National SC-ST Hub: Enabling Enterprise Growth

Launched on **18 October 2016,** the **National SC-ST Hub (NSSH) Scheme** provides focused support to enterprises across different stages of their growth journey. Implemented through the **National Small Industries Corporation (NSIC),** the scheme helps address barriers faced by SC/ST-owned enterprises and supports their participation in public procurement.

Enterprise development initiatives under NSSH include training, mentoring, business development, networking and knowledge support. Together, these interventions help entrepreneurs improve business capabilities, access new opportunities and build more competitive enterprises.



Expanding Reach, Deepening Inclusion

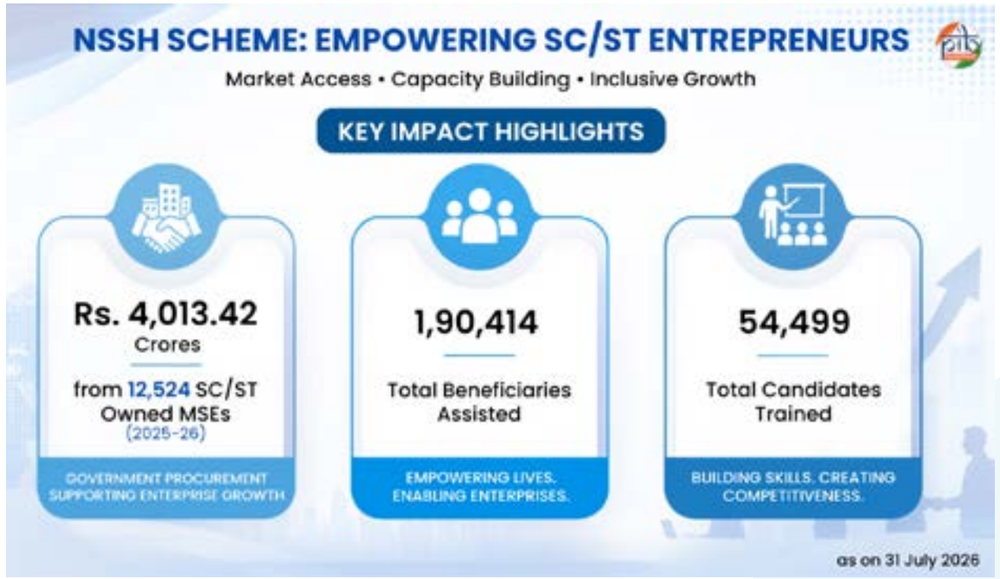
NSSH's impact is reflected not only in the number of entrepreneurs supported, but also in their growing participation in markets. By linking entrepreneurial support with procurement opportunities, the scheme is helping SC/ST-owned businesses improve their capabilities, expand market presence and pursue sustainable growth.

Since its inception, NSSH has assisted **1,90,414 beneficiaries,** and **trained 54,499 candidates,** as of 31st July 2026. It has also contributed to a significant expansion in procurement from SC/ST Owned MSEs, which increased **nearly 39-fold from ₹99.37 crore in 2015-16 to ₹4,013.42 crore in 2025-26. Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu and Assam** emerged as the five leading States under NSSH.

During the period 2025-26:

- **₹4013.42 crore procurement** recorded from **12,524 MSEs**
- **10,717 candidates trained** through **47 institutions across 27 States,** including **24 Aspirational Districts**
- **55% of candidates trained were women**

Training programmes were aligned with public procurement and GeM opportunities to improve their market relevance. Key areas included cafeteria management and food production, welding and Computer-Aided Design (CAD)/Computer-Aided Manufacturing (CAM), laundry services, fashion designing and tailoring and bamboo-based work.



Supporting Enterprises Across the Growth Journey

NSSH brings together a range of interventions to address different requirements of enterprise growth.

Special Credit Linked Capital Subsidy Scheme (SCLCSS)

SCLCSS supports new and existing SC/ST-owned MSEs in strengthening capacity through investment in plant, machinery and equipment. It provides a **25% capital subsidy, capped at ₹25 lakh,** for purchases financed through institutional credit. The scheme covers both manufacturing and service enterprises without product/sector-specific restrictions.

Progress since inception (2016) till March 2026:

- **3,160 MSEs** received support, amounting to **₹356.10 crore**
- Coverage extended to **233 districts across 27 States and UTs**

Single Point Registration Scheme (SPRS)

SPRS helps MSEs access Government procurement opportunities through registration with NSIC. Registered MSEs receive **free tender sets and exemption from payment of Earnest Money Deposit (EMD),** alongside other procurement benefits.

Under the Public Procurement Policy, Central Ministries, Departments and CPSEs are required to procure **25% of their annual purchases from MSEs,** with **4% of total procurement earmarked for SC/ST-owned MSEs.**

Special Marketing Assistance Scheme (SMAS)

SMAS helps SC/ST enterprises improve product visibility and competitiveness through exhibitions, trade fairs, vendor programmes, workshops and awareness campaigns. Registered enterprises can participate in **up to four domestic and two international events each financial year.**

International exhibition support extends up to **₹3 lakh for micro, ₹2.5 lakh for small and ₹1.5 lakh for medium enterprises.** Enterprises must be registered on the **Udyam Registration Portal and MSME Data Bank.**

Progress during 2025-26:

- **141 SC/ST MSEs** were facilitated to participate in **4 domestic exhibitions**
- **247 Special Vendor Development Programmes** were organised with CPSEs
- **197 e-tendering workshops** were conducted
- **230 awareness workshops** were organised with Central Public Sector Enterprises (CPSEs) and Government departments

Bank Loan Processing Reimbursement Scheme

Designed to lower borrowing costs for SC/ST MSEs, the support reimburses **80% of loan processing fees or ₹1 lakh, whichever is lower,** excluding applicable taxes. Benefits can be claimed after loan disbursement and multiple times in a financial year. Loans from **Scheduled Commercial Banks, NBFCs and State Finance Corporations** are covered.

Bank Guarantee Charges Reimbursement Scheme

To ease the cost of participating in Central or State Government and Public Sector Enterprise tenders, SC/ST MSEs can claim reimbursement of Performance Bank Guarantee charges. The support covers **80% of eligible charges or ₹1 lakh, whichever is lower,** excluding applicable taxes.

Testing Fee Reimbursement Scheme

This scheme helps SC/ST MSEs reduce costs associated with product testing, licensing and certification given by **Bureau Of Indian Standards**. It reimburses **80% of eligible testing fees or ₹1 lakh, whichever is lower,** excluding applicable taxes in a financial year.

Testing must be undertaken through **NABL/BIS-accredited, Government or PSU laboratories.**

Export Promotion Council Membership Reimbursement Scheme

To facilitate access to export networks, SC/ST MSEs receive support towards membership of **Export Promotion Councils (EPCs).** The reimbursement covers **80% of eligible membership charges or ₹20,000, whichever is lower,** excluding applicable taxes per financial year. It includes **annual membership fees, one-time subscription charges and entry fees.** Applicants must hold a valid **Import Export Code (IEC) and Registration-cum-Membership Certificate (RCMC).**

Capacity Building Management Fee Reimbursement Scheme

Managerial and business skills are supported through short-term training at **the top 50 management institutes identified under NIRF.** SC/ST entrepreneurs and their wards can attend programmes lasting **1-30 days,** with up to two courses supported annually. Participants can receive **90% of course fees or ₹1 lakh, whichever is lower,** per financial year.

Membership Fee of Government-Promoted E-Commerce Portals

This component helps SC/ST MSEs expand digital market access through **Government-promoted e-commerce portals.** These include **GeM, e-Khadi, TRIFED, Tribes India and MSME Mart.** It reimburses **80% of membership fees or ₹25,000, whichever is lower,** excluding applicable taxes per financial year.



This integrated approach helps enterprises move from being potential suppliers to competitive participants in institutional and Government markets.

From Support to Market Success

Beyond financial and market-related assistance, NSSH helps enterprises translate business support into stronger commercial outcomes. The **Business Accelerator Programme (BAP)** provides structured mentorship and industry insights across business strategy, pricing, operational efficiency and market positioning.

The programme helps entrepreneurs adopt structured, data-driven approaches and align their businesses with market requirements. This strengthens their competitiveness and opens larger opportunities, particularly in **Government procurement.**

Success Stories (BAP)

Creating Relevance in Compliance-Driven Markets- M/s Safety & Security Engineering, West Bengal



Mr. Debasish Mondal strengthened pricing, cost management and market positioning. The support improved his enterprise's competitiveness in Government procurement. It subsequently secured tenders worth ₹8.48 lakh from Power Grid Corporation of India Limited.



Scaling Clean Energy- M/s Renergy Solution Pvt. Ltd., Assam

Shri Sunil Popatrao Jagtap strengthened his business strategy and understanding of Government procurement. Applying these insights, Sawalaram Enterprises secured a ₹5.10 lakh SAIL tender for hydraulic cylinders. The opportunity strengthened business performance and expanded the enterprise's market presence.

Powering Motion with Precision-Sawalaram Enterprises, Maharashtra



The National SC-ST Hub is widening opportunities for SC/ST entrepreneurs to participate more meaningfully in India's economic growth. Its interventions help businesses build skills and connect with larger markets. This progress is also enabling greater participation in public procurement and creating pathways for employment and enterprise growth. As its reach expands, NSSH is contributing to a more inclusive, diverse and competitive MSME ecosystem.

Strengthening Entrepreneurship, Advancing Inclusion

The National SC-ST Hub is widening opportunities for SC/ST entrepreneurs to participate more meaningfully in India's economic growth. Its interventions help businesses build skills and connect with larger markets. This progress is also enabling greater participation in public procurement and creating pathways for employment and enterprise growth. As its reach expands, NSSH is contributing to a **more inclusive, diverse and competitive MSME ecosystem.**

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India’s New-Age Space Technologies

The Road to Self-Reliance

Published On: 28 October 2026

Click here for Hindi

India's space journey began in 1963 with a sounding rocket launched from Thumba, Kerala. It now looks ahead to the planned Bharatiya Antariksh Station. New technologies are driving this progress. They include reusable launch vehicles, electric, green and nuclear propulsion, and in-orbit servicing. Through SpaDeX, India also became the fourth country to achieve autonomous docking of two spacecraft in orbit. These advances strengthen self-reliance. Meanwhile, Gaganyaan is advancing India's human spaceflight goals.

Space Science & Relevance for Today

India's organised space activities began in 1962 with the establishment of the Indian National Committee for Space Research (INCOSPAR) under the vision of Dr Vikram A. Sarabhai. The first sounding rocket was launched from Thumba, Kerala on 21 November 1963. The Indian Space Research Organisation (ISRO) was formed on 15 August 1969, superseding INCOSPAR, and was subsequently brought under the Department of Space in 1972. Since its inception, ISRO followed a development-first philosophy: using space technology to solve problems on the ground. Over the decades, it grew far beyond a launch service provider, and its efficiency and technical excellence have earned global recognition. That reputation now rests on a simple promise: every mission must serve the common citizen.

That vision now shapes daily life across the country. **Communication satellites** extend connectivity to remote and underserved areas. **Earth observation data** support agriculture, disaster assessment, planning, environmental monitoring and other national requirements. Weather satellites track cyclones and monsoons, enabling early warnings that save lives. Fishermen, farmers and coastal communities rely on these alerts to protect their livelihoods. These systems connect citizens, protect communities, strengthen governance and drive inclusive, sustainable growth. Beyond these services, space also guards India's frontiers and shapes its future. **Space-based communication** systems support national security and strategic requirements.

Building on these strengths, emerging technologies are opening fresh avenues for innovation, connectivity and service delivery. Private enterprises and start-ups are now joining this journey. This positions India as a confident, self-reliant and globally respected space power. Click To Read More in Detail: India's Space Odyssey

Emerging Space Technologies

As India moves toward greater self-reliance and bolder goals, a new generation of technologies is taking shape to power this journey. These innovations span **next-generation launch systems, in-space operations, human spaceflight, and advanced navigation and communications.** They mark a shift from India's early achievements to a future-ready space programme. Built for the decades ahead, these associated programmes aim to keep India competitive, connected and firmly self-reliant.



Next-Generation Launch Vehicles (NGLV)

Access to space begins with the ability to launch. A country that can build and fly its own rockets decides when, how and at what cost it reaches space. India's launch journey has moved from small, single-use (expendable) rockets to heavy-lift vehicles, and it is now moving towards reusable systems.

The approved **outlay of ₹8,240 crore** covers development costs, three developmental flights, essential facilities, programme management and the launch campaign. Designed for a maximum capacity of **30 tonnes to Low Earth Orbit (LEO),** the **NGLV** triples India's current launch payload capability compared to the 10-tonne LEO limit of the LVM3. In addition, a partially reusable NGLV variant with a 14-tonne LEO payload capability is being developed to support lower-cost access to space. Its **reusability feature** will also lower the cost of reaching space.

India's Traditional Launch Vehicles

- **PSLV (Polar Satellite Launch Vehicle):** PSLV (Polar Satellite Launch Vehicle), ISRO's workhorse, can carry up to 1,750 kg to a 600-km Sun-Synchronous Polar Orbit (SSPO) and up to 1,425 kg to Sub-Geosynchronous Transfer Orbit (Sub-GTO), depending on mission configuration.
- **GSLV (Geosynchronous Satellite Launch Vehicle):** It uses the indigenous Cryogenic Upper Stage and can carry communication satellites of up to the 2-tonne class.
- **LVM3 (Launch Vehicle Mark-3)** is India's heavy-lift launch vehicle. It can carry communication satellites of the 4-tonne class to Geosynchronous Transfer Orbit (GTO), and payloads of the 10-tonne class to Low Earth Orbit (LEO).
- **SSLV (Small Satellite Launch Vehicle):** SSLV is a three-stage vehicle weighing ~120 tonnes at lift-off. It can launch satellites of up to the ~500-kg class into a 500-km planar orbit.

In September 2024, the Union Cabinet approved the development of the **Next Generation Launch Vehicle (NGLV).** NGLV will enable both national and commercial missions. These include human spaceflight missions to the **Bharatiya Antariksh Station,** as well as **lunar** and **interplanetary exploration.** It will also launch communication and earth observation satellite constellations to Low Earth Orbit. These missions will benefit the entire space ecosystem and boost the nation's capability and capacity.

Understanding Key Terms

Sun-Synchronous Orbit (SSO): A Sun-Synchronous Orbit (SSO) is a near-polar orbit in which a satellite passes over an area at approximately the same local solar time, enabling comparisons under similar illumination. The interval between repeat observations of a particular location varies with the satellite and its orbit.

Geostationary Transfer Orbit (GTO): GTO is an elliptical intermediate orbit used to transfer a satellite into geostationary orbit (GEO). Its lowest point (perigee) is typically a few hundred kilometres above Earth, while its highest point (apogee) is near 35,786 km above Earth's surface. The launch vehicle typically places the satellite in GTO rather than directly into GEO. Near apogee, the satellite fires its onboard apogee motor to raise its perigee and circularise the orbit. Additional manoeuvres may be required to align the orbit with Earth's equatorial plane. In GEO, the satellite orbits above the equator with a period matching Earth's rotation, appearing stationary relative to the ground.

Cryogenic Upper Stage: A cryogenic upper stage is the final stage of a launch vehicle that uses these propellants to provide the high efficiency needed to place satellites into their intended orbits. ISRO's indigenous cryogenic upper stage used on GSLV employs liquid hydrogen (LH_2) as fuel and liquid oxygen (LOX) as oxidiser, both stored at extremely low temperatures. It replaced the Russian-supplied stage used in earlier GSLV flights, strengthening India's self-reliance in advanced launch vehicle technology.

Reusable Launch Vehicle (RLV)

RLV technologies can help reduce launch costs and improve operational efficiency. Unlike conventional expendable (single-use) launch vehicles, reusable systems are designed to recover major components for subsequent missions. Their development requires controlled atmospheric re-entry, autonomous navigation, aerodynamic flight and precision landing. ISRO has demonstrated autonomous runway-landing technologies using its winged Reusable Launch Vehicle technology demonstrator, Pushpak. The three RLV Landing Experiments were completed on 2 April 2023, 22 March 2024 and 23 June 2024, respectively. LEX-03 validated autonomous landing under more challenging cross-range and wind conditions.

Scramjet Technology: Powering India's Reusable Space Transportation

A scramjet (supersonic combustion ramjet) is an air-breathing jet engine. It carries only fuel and draws oxygen from the surrounding air. Conventional rockets haul both fuel and oxidiser. A scramjet is therefore lighter and can deliver more payload for the same lift-off mass. It works only within the atmosphere at very high velocity, so a booster must first accelerate it. Its velocity is expressed as a Mach number. Mach 1 equals the speed of sound. Anything above Mach 5 is called hypersonic. Scramjets can complement reusable launch vehicles, which retrieve and refly major parts to cut costs. They offer a promising path to affordable space access. **India flight-tested its scramjet in 28 August 2016.** It reached Mach 6, a hypersonic velocity, making the country the fourth to demonstrate this. **On 22 July 2024, ISRO separately conducted an experimental RH-560 sounding-rocket flight** to demonstrate air-breathing propulsion systems and assess their performance.



Indigenous Space Hardware and Critical Technologies

Every space mission relies on critical technologies, including engines, thrusters, fuels and power systems. Developing these technologies within India helps reduce dependence on foreign suppliers and strengthens the country's ability to build and operate spacecraft independently. ISRO is advancing indigenous propulsion technologies, including electric propulsion and alternative fuels. It is also exploring technologies for future missions. These efforts contribute to India's long-term goal of self-reliance in space.

One important area of progress is **electric propulsion,** which uses electrical energy to accelerate propellant and generate thrust. Compared with conventional chemical propulsion, it can achieve the same orbital changes using much less propellant. This reduces the fuel carried by a satellite and frees up mass for communication equipment and other payloads. On 27 March 2025, ISRO successfully completed a 1,000-hour life test of its **indigenous 300 mN stationary plasma thruster.** Its specific impulse, a measure of propulsion efficiency, is at least six times that of conventional propulsion systems. ISRO plans to validate the technology aboard its Technology Demonstration Satellite (TDS-01). It is intended to support future electric-propulsion satellites, including orbit raising and station keeping

Alongside electric propulsion, ISRO is developing alternative propellants to reduce environmental impacts and improve propulsion efficiency i.e., **Green Propulsion.** One example is **ISROSENE,** a rocket-grade kerosene. Liquid oxygen–kerosene propellants are being developed for semicryogenic rocket-engine applications.

Progress in green propulsion also extends beyond ISRO's own development programmes. Under DRDO's **Technology Development Fund,** Bengaluru-based Bellatrix Aerospace developed a 1 N-class green monopropellant thruster for microsatellite attitude control and orbit keeping. Its in-orbit functionality was demonstrated on a payload launched aboard PSLV-C58 in January 2024.

These developments illustrate India's progress in indigenous electric and green propulsion technologies. Continued testing and validation will help determine their readiness for wider use in future space missions.



Radioisotope Heating and Power Technologies

ISRO and Department of Atomic Energy (DAE) are collaborating on requirements for Radioisotope Heater Units (RHU), which supply heat, and Radioisotope Thermoelectric Generators (RTG), which convert radioisotope heat into electrical power ISRO is collaborating with the DAE on RHU and RTG requirements for possible future Chandrayaan and Mars missions.

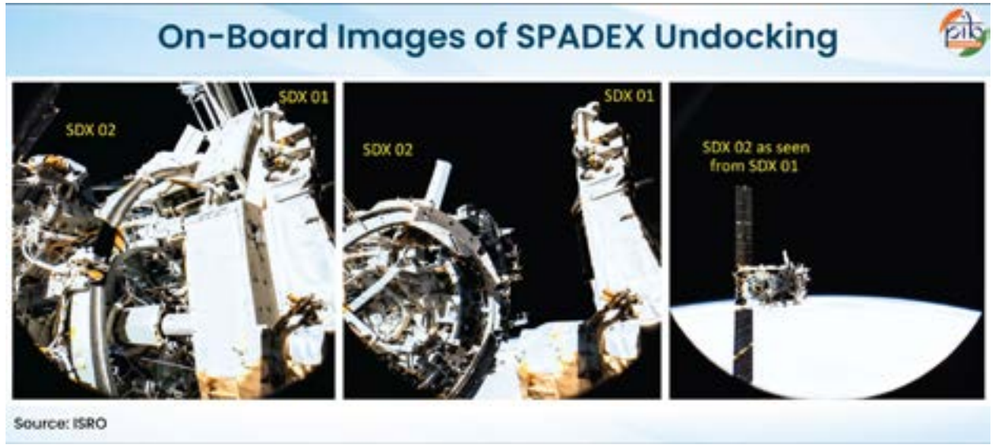
In-Space Operations and Human Spaceflight

In-space operations are the activities spacecraft carry out once they are in orbit, such as **rendezvous, docking and undocking.** Launching a satellite is only the first step: complex missions such as a space station, a crewed flight or a lunar sample return depend on what spacecraft can do after launch. In-space docking technology is essential when multiple rocket launches are needed to achieve common mission objectives, and it underpins ambitions such as sample return from the Moon and the building and operation of the Bharatiya Antariksh Station.

ISRO's SpaDeX mission first docked its two satellites on 16 January 2025 and subsequently demonstrated undocking. A second docking was completed with full autonomy from an inter-satellite distance of 15 m on 20th April 2025. Bidirectional power transfer between the docked satellites was demonstrated on 21st April 2025. **India thereby became the fourth country to demonstrate space docking, after the United States, Russia and China.** This achievement also advances technologies required for future missions.

Beyond joining spacecraft, docking enables them to work together in orbit. In-orbit servicing could, in future, enable refuelling, repair or upgrading of spacecraft in orbit, without bringing them back to Earth. SpaDeX demonstrated docking, undocking and power transfer. These interventions can extend satellite lifespans and reduce the need for replacement missions. These achievements provide important technological building blocks for developing future in-orbit servicing capabilities.





Next-Generation Navigation and Communications

Satellite navigation and communication systems support essential services across India. Navigation satellites provide positioning, navigation and timing information, while communication satellites relay television, telephone, broadband and other data signals. Together, these systems support transportation, financial services, telecommunications, disaster management and national security. India is strengthening these capabilities through ISRO's indigenous NavIC navigation system and communication satellites.

Navigation with Indian Constellation (NavIC) is India's independent regional satellite **navigation system,** developed and maintained by ISRO. It provides positioning, navigation and timing services across India and up to 1,500 kilometres beyond the Indian mainland. NavIC offers a **Standard Positioning Service** for civilian users and **an encrypted Restricted Service for authorized users.** These capabilities support terrestrial, aerial and maritime navigation, surveying, vehicle tracking and precise timing. NavIC also supports **emergency warning messages** for fishermen operating beyond terrestrial network coverage. Its integration into compatible devices and applications can further expand its use across civilian and strategic sectors.

Additionally, India's **communication satellites** support broadcasting, broadband connectivity and secure communications. GSAT-24, launched aboard Ariane-5 from Kourou, French Guiana, on 23 June 2022 at 03:20 IST

(22 June local time), was realised to meet Direct-to-Home (DTH) television requirements in India. Building on this capability, GSAT-N2 (GSAT-20) was launched on 19 November 2024. This high-throughput satellite has a capacity of approximately 48 Gbps and is designed to support broadband and in-flight connectivity across India, including remote island regions.

Communication satellites also serve **India's defence requirements.** CMS-03, also known as GSAT-7R, was launched on 2 November 2025. It is a dedicated communication satellite for the Indian Navy. These satellites strengthen India's space-based communication infrastructure and support civilian connectivity, maritime operations and national security.

Advanced Earth Observation Satellites

Earth observation satellites monitor the land, oceans, ice-covered regions and atmosphere from space. Their data supports agriculture, disaster management, water resource planning, climate research and national security. Between December 2020 and December 2025, ISRO launched 22 satellites, including seven Earth observation satellites. These satellites provide images and data for monitoring natural resources, tracking environmental changes and supporting informed planning. India continues to strengthen these capabilities through advanced technologies, including radar imaging and hyperspectral observation.

A major advancement in Earth observation is the **NASA-ISRO Synthetic Aperture Radar (NISAR) mission.** It was launched on 30 July 2025 aboard GSLV-F16 from Sriharikota. It is the first satellite mission to use two radar frequencies together: NASA's L-band and ISRO's S-band. Radar can collect data through clouds and in darkness, enabling observations in almost all-weather conditions, both day and night. NISAR is designed to observe the Earth's land and ice-covered surfaces every 12 days. Its data can help scientists monitor ground deformation, glacier movement, vegetation changes, soil moisture and natural hazards. These observations can also support coastal monitoring and disaster response.

While radar reveals changes in the Earth's surface, hyperspectral imaging helps identify different materials and surface characteristics. ISRO launched the **Hyperspectral Imaging Satellite (HysIS)** on 29 November 2018. It observes the Earth's surface in visible, near-infrared and shortwave-infrared wavelengths. By recording information across numerous narrow bands of light, HysIS can distinguish features that ordinary imaging may not readily identify. Its data supports applications in agriculture, forestry, soil and geological studies, coastal zones and inland waters.

Did You Know? HysIS was launched alongside 30 foreign satellites from eight countries. These comprised one micro-satellite and 29 nano-satellites. The participating countries were Australia, Canada, Colombia, Finland, Malaysia, the Netherlands, Spain and the United States. Of these, 23 satellites were from the United States. The launch also demonstrated PSLV's capability to deploy multiple satellites for international customers.

Way Forward: Building a US$44 Billion Space Economy

India's space sector is increasingly contributing to economic growth, private investment and industrial capability, alongside its scientific and strategic goals. As per the Department of Space, India's space economy is targeted to reach US$44 billion by 2033. Emerging technologies such as reusable launch vehicles, air-breathing propulsion, electric propulsion and in-space docking are supporting this growth.

This technological momentum is already creating economic opportunity. NewSpace India Limited (NSIL) has signed 118 Technology Transfer Agreements to transfer 83 technologies developed by ISRO to Indian industry. As a result, investor confidence is also growing. Cumulative investment in Indian space start-ups reached approximately US$618.5 million as of 31 March 2026, with funding shifting from early-stage seed support to larger, growth-stage rounds.

Together, these developments show that India's emerging space technologies are not only advancing national capability but also building a strong, enterprise-led space economy for the years ahead.

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Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)

One Year of Focused Agricultural Development Across 100 Districts

Published on: 10 October 2026

Click here for Hindi

Transforming Agriculture Through District-Level Action

India's agriculture sector has significant potential across diverse regions and farming communities. However, despite rich potential, many areas face challenges like low productivity, inadequate irrigation, limited access to credit, and lack of post-harvest infrastructure. As a result, these areas are not able to attain their full agricultural potential and lag behind in economic development.

PM Dhan-Dhaanya Krishi Yojana (PMDDKY) seeks to address these gaps, and develop 100 Aspirational Agricultural Districts through focused intervention. By addressing district-specific needs the scheme can help unlock opportunities in productivity, irrigation, credit access, and post-harvest infrastructure. PMDDKY was approved by the Union Cabinet on 16th July, 2025 for a period of six years, and was formally launched by Hon'ble Prime Minister on 11th October, 2025. It celebrates its first anniversary on 11th October this year.

The six-year initiative, beginning with 2025-26, focuses on transforming agriculture and allied activities across **100 Aspirational Agricultural Districts**. These districts were identified using three key indicators: **low productivity, low cropping intensity, and less agricultural credit disbursement**. The selection also considered the share of **net cropped area and operational holdings** in each State and Union Territory. Each State has at least one selected district.



The scheme is being implemented through the convergence of **36 Central schemes across 11 Ministries and Departments, State schemes and private sector participation**, enabling interventions suited to local agricultural priorities.

Administrative Structure for Implementation

The PMDDKY scheme follows a three-tier implementation structure-

- **District Level:** The **District Dhan Dhaanya Krishi Yojana Samiti**, headed by the **District Collector/ DM**, prepares and implements the **District Action Plan**.
- **State Level:** The **State Dhan Dhaanya Krishi Yojana Samiti**, headed by the **Chief Secretary of the State**, reviews and monitors the **District Plans**.
- **National Level:** Two committees oversee the scheme. The **National Executive Committee** is headed by the **Union Minister for Agriculture and Farmers Welfare**. The National Monitoring Committee is headed by the **Secretary, DA&FW**.

District Action Plans

- **District Action Plans (DAPs)** are prepared based on the baseline and diagnostic analysis. The plans identify local agricultural needs and address them by converging relevant Central and State schemes. DAPs sets outcome-based targets, annual milestones, and interventions linked to relevant schemes.
- DAPs are sent to the concerned State departments for incorporation into the respective annual action plans. This enables necessary approvals and fund release.
- Progress is tracked through **121 indicators** across 36 schemes, comprising 7**4 output and 47 outcome indicators**. District performance on output indicators is ranked monthly through the PM-DDKY dashboard-https://pmddky.niti.gov.in/.

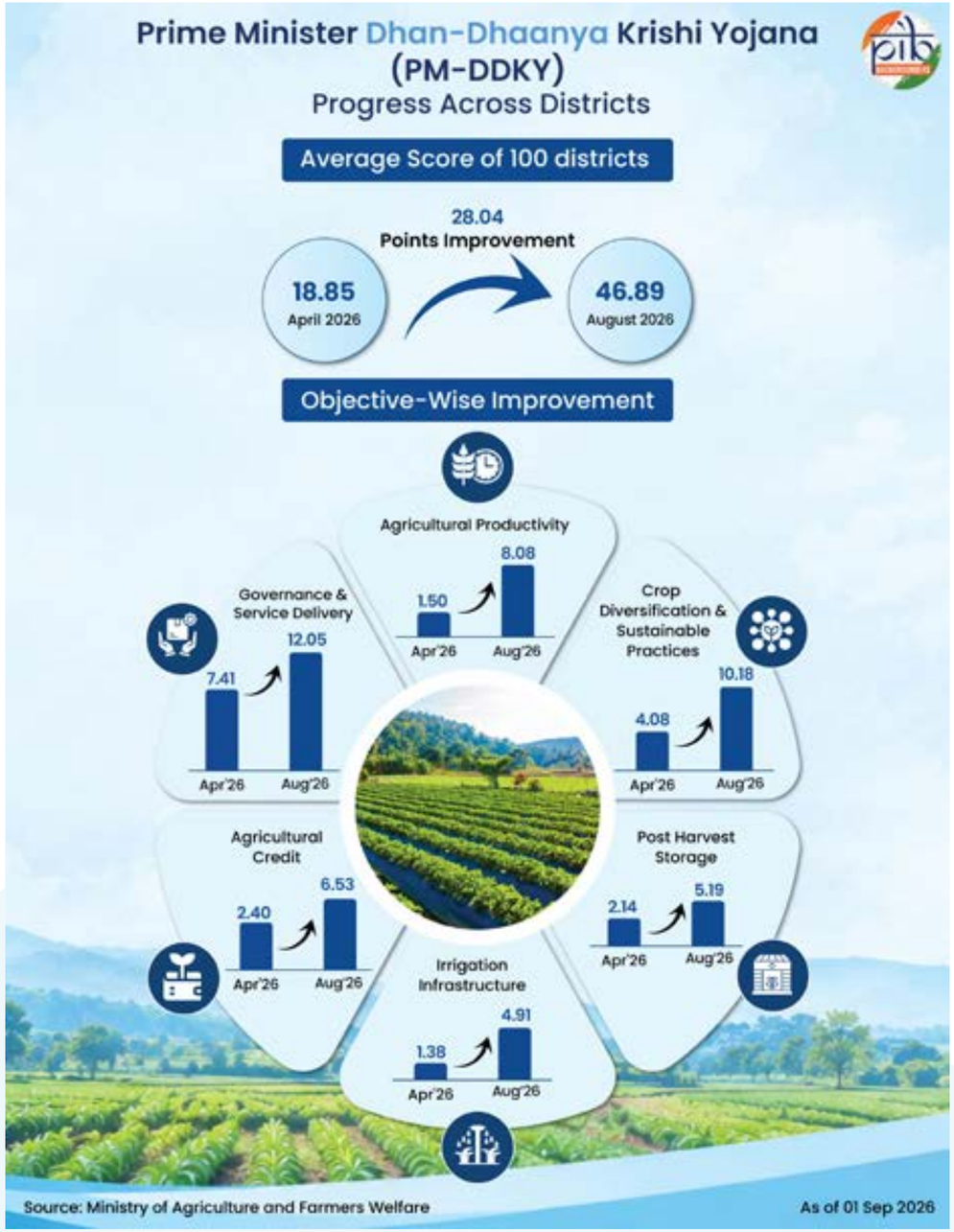
A Year of Implementation and Progress

The PMDDKY dashboard became operational in the **last week of October**

2025. Monthly output-indicator rankings began in November 2025, providing a mechanism for monitoring progress across the 100 districts.

- All the 100 DDKY districts have prepared DAPs and it is under implementation.
- Committees were constituted at the **State, District, and national levels** for review and monitoring.
- All 100 districts submitted data against output indicators up to August 2026. All 100 districts also submitted outcome indicator data for the financial year 2025-26.
- Central Nodal Officers are regularly reviewing the progress and guiding the districts.
- Department of Public Enterprises has included adoption of DDKY districts for **CSR** activity by **CPSEs** for the **FY 2026-27 and 2027-2**8.
- The average score of the 100 districts across the six objectives increased from **18.85 in April 2026** to **46.89 in August 2026**, an improvement of **28.04 points**.
- **Objective-wise average scores** also recorded improvement during the same period-
  - » Enhancing Agricultural productivity: **1.50 to 8.08**
  - » Encouraging Crop diversification and sustainable agricultural practices: **4.08 to 10.18**
  - » Augmenting post-harvest storage capacity: **2.14 to 5.19**
  - » Improving irrigation infrastructure: **1.38 to 4.91**
  - » Enabling greater access to short-term and long-term agricultural credit: **2.40 to 6.53**
  - » Better governance & service delivery: **7.41 to 12.05**

The first year also created platforms for farmers and Farmer Producer Organisations (FPOs) to exchange experiences and explore new opportunities. The **PM-DDKY FPO Sangam**, held in **December 2025**, brought together over **72 FPOs from 15 States and 33 PM-DDKY districts**. The event featured experiences on productivity, market access and income enhancement. It also covered natural farming, oilseeds, beekeeping, protected cultivation, micro irrigation, institutional finance and digital agriculture.



Best Practices from Dhan-Dhaanya districts

Local Processing, Better Price Realisation



In **Gadchiroli, Maharashtra**, a **PMDDKY district**, Desaiganj Farmers Producer Co. Ltd. (FPO), has 800 farmer members. It has established a rice processing unit with **3 tonnes per hour capacity** and a **900 metric tonne (MT) warehouse**. The post-harvest infrastructure of its prized Jay Sri Ram rice variety enables local value addition and better price realisation. The FPO recorded a **turnover of Rs.1.24 crore in FY 2025-26**.

Better Markets, Better Returns



In **Tumakuru, Karnataka**, a **PMDDKY district**, Tiptur Farmer Producer Co. Ltd. **FPO**, has **750 farmer members**. It supplies ball copra to a French multinational company, enabling superior prices and market access for FPO farmers. The FPO recorded a **turnover of Rs.1.60 crore in FY 2025-26** and has aggregated **more than 138 tonnes of copra worth over Rs.1.9 crore as of 12 September 2026**.

Smart Irrigation, Better Farm Productivity



In **Jaisalmer, Rajasthan**, a **PMDDKY district**, Jaisalmer Krishi Fed Producer Co. Ltd. has **1,236 farmer members**. The FPO practices Integrated Pest Management **(IPM)-based cumin cultivation across 2,000 acres**. It uses **solar-powered sprinkler irrigation across 500 acres**. The initiative promotes **efficient water use, renewable energy and improved farm productivity**.

Building Agricultural Momentum Across Districts

PMDDKY completes its first year on **11 October 2026**, marking a year of focused district-level action. Across 100 districts, District Action Plans and indicator-based monitoring are now in place. District-specific interventions are supporting agricultural development on the ground. The progress achieved provides a foundation for stronger convergence and sustained agricultural development in the years ahead.

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Five Years of PM GatiShakti: Transforming India’s Infrastructure Planning

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PM GatiShakti National Master Plan (PMGS-NMP) has evolved from a national infrastructure mapping platform into a wider planning framework. It brings together Ministries, States and infrastructure networks through a GIS-based platform to support integrated planning and project coordination. **Today, it covers 58 Central Ministries and Departments and all 36 States and Union Territories.**

Infrastructure As The Engine of Viksit Bharat

India is building infrastructure at a scale that requires coordination across sectors and modes of transport. Roads, railways, ports, airports, waterways and utilities often intersect across the same regions. Planning these networks together can help in cost and time savings, coordinate projects and use existing infrastructure more efficiently. This created a need for an approach that integrates different infrastructure networks into a common planning framework.

To address this need, **the PM GatiShakti National Master Plan was launched on 13 October 2021.** It brought data from different ministries, States and Union Territories onto a common Geographic Information System (GIS)-based platform. PM GatiShakti enables planners to view infrastructure, geographic features, economic zones and other relevant data together, supporting data-driven planning and decision-making for infrastructure projects. Five years on, this approach has grown into a nationwide planning framework.

PM GatiShakti At A Glance

PM GatiShakti is guided by **six principles** that seek to make infrastructure planning more integrated, efficient, and coordinated. This includes integrated development, multimodal infrastructure, last mile connectivity, expedited land acquisition, minimised clearances and reduced ecological impact.

Key features of PM GatiShakti include:

- **Seven Infrastructure Engines:** Roads, Railways, Ports, Waterways, Airports, Mass Transport and Logistics Infrastructure form the core sectors of the plan.
- **Whole-of-Government Planning:** The National Master Plan covers **58 Central Ministries and Departments and all 36 States and Union Territories,** enabling infrastructure proposals to be planned and assessed across sectors.
- **Integrated Digital Planning:** The NMP brings together infrastructure, and geospatial information on a common GIS-based platform, supporting spatial planning and decision-making.
- **Wider Data Access:** The **PM GatiShakti Public** platform provides access to **230 approved datasets,** enabling site suitability analysis, connectivity mapping, alignment planning and compliance checks.
- **Data Layers: Over 23,493 data layers, as of 12 October 2026,** bring infrastructure and other relevant information onto the common GIS-based platform.



Do You Know?

PM Gati Shakti incorporates infrastructure schemes from various Ministries and State Governments, such as Bharatmala, Sagarmala, inland waterways, dry/land ports, and UDAN.

ITLA: Strengthening Integrated Transport Planning

Complementing PM GatiShakti, the Union Cabinet recently approved the establishment of the Integrated Transport & Logistics Authority (ITLA). The Authority will focus on long-term transport planning and coordination.

ITLA will prepare a **National Transport Master Plan** with a planning horizon of ten years or more. It will assess sectoral and annual transport plans, and undertake technical appraisal of projects costing ₹500 crore or more. The authority will also monitor their implementation. It will also develop a National Transport Data Repository (NTDR) by integrating information from sources such as FASTag, Vahan, and GSTN e-way bills.

How GatiShakti Works: From Coordination to Project Planning

PM GatiShakti has a **three-tier institutional framework** comprising the following:

- **Empowered Group of Secretaries (EGoS):** Chaired by the Cabinet Secretary, the EGoS oversees the implementation of PM GatiShakti and reviews, considers and approves changes in the Master Plan.
- **Network Planning Group (NPG):** The NPG brings together the Heads of Network Planning Divisions from infrastructure Ministries and Departments. It examines infrastructure proposals and ensures unified planning, integration and optimisation. It also monitors developments under the National Master Plan for project planning.
- **Technical Support Unit (TSU):** The TSU comprises domain and subject-matter experts who support the evaluation process. It assists the Logistics Division in performing its role as the PM GatiShakti Secretariat.

As of **11 August 2026,** the NPG had **evaluated 396 infrastructure projects** with a total estimated cost of about **₹18.66 lakh crore.** Of these, **256 projects had been sanctioned, of which 198 were under implementation**. The institutional framework is supported by a digital platform that provides planners with **geospatial data, satellite imagery and analytical tools.**

Gati Shakti Vishwavidyalaya: Building Expertise for Integrated Infrastructure Planning

Gati Shakti Vishwavidyalaya (GSV) is a first-of-its-kind university focused exclusively on the transport and logistics sectors. Established in 2022, the university brings together education, executive training and research across transport-related disciplines.

GSV supports the PM GatiShakti National Master Plan and the National Logistics Policy (2022) through specialised education, training and research. GSV serves as a nodal agency for developing and delivering courses on both initiatives. The collaboration also envisages knowledge centres to share best practices and promote research and innovation in logistics. As of July 2026, the university had trained more than 2.4 lakh officers through courses designed for PM GatiShakti. The university is also expanding its focus on applied research for integrated transport planning, alongside specialised areas such as maritime transport, bridge and tunnel engineering, and defence logistics.

From Data To Decisions: How Digital Planning Is Helping Planners

The NMP brings together **GIS-based data on infrastructure, geographic features, and demography** on a common platform. Economic zones are also mapped alongside multimodal connectivity infrastructure to support integrated infrastructure planning. This enables planners to view different infrastructure networks and relevant geographic information together while planning projects.

The platform combines **spatial planning and analytical tools** with mechanisms for updating and integrating data. It can support activities such as adding project information, measuring proximity, identifying Go/No-Go areas (areas where development may be restricted) and obtaining clearances.

Mapping Infrastructure and Infrastructure Nodes

The PM GatiShakti NMP maps **economic, social and logistics nodes alongside multimodal connectivity infrastructure.** This brings infrastructure linkages and the surrounding development context into the planning process. The platform helps identify **infrastructure linkages required to support economic zones and development projects,** as well as **missing connectivity gaps** that can affect the seamless movement of people, goods and services.

Economic zones such as **textile and pharmaceutical clusters, defence**

corridors, electronic parks, industrial corridors, fishing clusters and agri zones are mapped to support integrated infrastructure planning.

Example: **Khagaria–Purnea** corridor in Bihar. The upgraded corridor is planned to connect five PM GatiShakti Economic Nodes, including a textile cluster, Mega Food Parks and fishing/seafood parks,



along with 11 logistics nodes. The planned connectivity is intended to facilitate faster movement of goods and passengers across the region.

Connecting Logistics Systems

Unified Logistics Interface Platform (ULIP) enables API-based integration of government logistics systems, while the Logistics Data Bank (LDB) provides real-time tracking of EXIM container movement. Together, they strengthen digital information exchange and visibility across the logistics ecosystem. As of July 2026, **ULIP connected 46 government systems across 12 Central Ministries through 142 APIs.**

Opening Geospatial Data to Wider Users

The digital ecosystem has also expanded beyond government users. In October 2025, the PM GatiShakti NMP platform was opened to the private sector through a **Query-Based Analytics Mechanism developed by Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N).** The platform provides regulated access to selected non-sensitive datasets for infrastructure planning and investment decisions.

The platform currently provides access to 230 approved datasets covering physical and social infrastructure assets. Users can undertake site **suitability analysis, connectivity mapping, alignment planning and compliance checks,** and generate analytical reports.

From Data to Monitoring

The digital platform also supports the tracking of project progress and updating of infrastructure data. The PM GatiShakti NMP Dashboard provides multi-sector reporting to track progress and derive actionable insights. The **Data Uploading and Management System (DUMS)** enables decentralised and real-time data ownership and updating.

The overall approach uses **geospatial data, satellite imagery and API integration** to support data-driven decision-making, planning and optimisation of infrastructure development.

PM GatiShakti in Action

- **Pune–Bengaluru Expressway:** The **699 km Expressway,** with expected completion in 2027–28, will connect industrial and economic clusters across Maharashtra and Karnataka. These include automobile and white-goods factories, pharmaceutical clusters, special economic zones, and defence corridors. The project connects **15 National Highways, 25 State Highways and 6 railway stations,** enabling multimodal connectivity. Using the PM GatiShakti NMP platform, the alignment was revised to reduce forest land overlap by 19%. The project is expected to reduce travel time by **7–8 hours**. It will also save approximately **16 crore litres of fuel annually** and reduce carbon emissions by around **39 crore kg.**

- **Jogighopa Multimodal Logistics Park, Assam:** The **Jogighopa Multimodal Logistics Park** is located on the northern banks of the Brahmaputra in Assam. It is designed to enable seamless cargo movement across **road, rail and inland waterways** in the Northeast. PM GatiShakti was used for integrated planning and demand analysis. A four-lane bridge under construction across the Brahmaputra between **Dhubri and Phulbari** is planned to reduce the travel distance from **205 km to 20 km** and travel time from about **seven hours to 30 minutes.**

- **Green Energy Corridor:** Ladakh–Haryana: The project, recommended by NPG under PM GatiShakti, will enable **evacuation and grid integration of 13 GW of renewable**

energy through a 5 GW transmission system. It includes a **480-km HVDC transmission line between Pang in Ladakh and Kaithal in Haryana,** with 5 GW HVDC terminals at both ends. The transmission system will pass through Himachal Pradesh and Punjab before connecting with the national grid at Kaithal. The project is targeted for completion by **FY2029–30.**

Building a Connected Infrastructure Future

Five years after its launch, PM GatiShakti has evolved from a national infrastructure planning initiative into a wider digital planning ecosystem. Its expansion across Ministries, States, districts and new infrastructure domains is creating a more integrated approach to planning India's next generation of infrastructure.

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Small and Medium Enterprises Growth Fund

Providing Capital to India’s Future Champions

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A New Growth Capital Push for SMEs

Small and Medium Enterprises (SMEs) form the backbone of the Indian economy, contributing to employment, exports, manufacturing output and innovation. To support their growth, the Union Cabinet has approved a commitment of **₹10,000** crore towards establishing the **SME Growth Fund (SGF).**

The Fund will provide patient equity capital to high-potential SMEs with demonstrated business viability and scalability. It aims to support the emergence of champion enterprises across manufacturing, services, technology, innovation-driven sectors and strategic value chains.

As **part of the holistic set of announcements made under the Union Budget 2026-27,** the initiative focuses on providing **equity, liquidity and professional support** to the MSME ecosystem.

Classification of SMEs

Enterprises are classified as micro, small or medium based on investment in plant and machinery or equipment, and annual turnover. Under the latest criteria (effective from April 2025), a **small enterprise** has investment of up to **₹25 crore** and turnover of up to **₹100 crore.** A **medium enterprise** has investment of up to **₹125 crore** and turnover of up to **₹500 crore.**

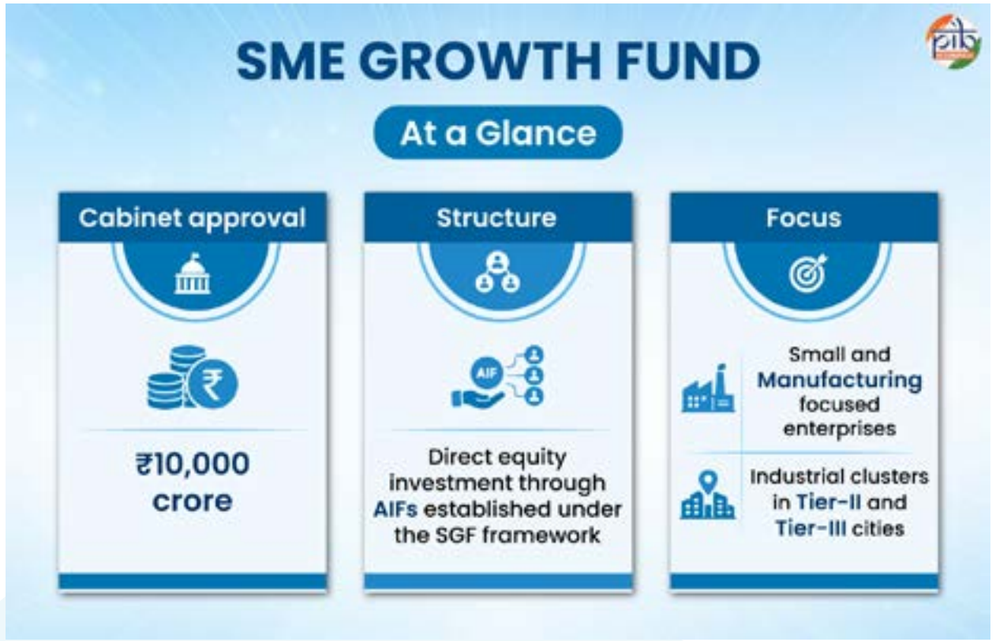
India's MSME Ecosystem

Contribution to the Economy: According to the Economic Survey 2025-26, **MSMEs account for 31.1% of GDP, 35.4% of manufacturing output and 48.58% of exports.**

Expanding Formal MSME Base: As of **6 October 2026,** total MSME registrations under **Udyam and the Udyam Assist Platform (UAP)** reached **~9.78 crore.** Registered MSMEs have also reported **~43.28** crore employment opportunities.

Women's Participation in MSMEs: Female-owned enterprises account for **37.6%** of total registrations

MSMEs Across Key Economic Activities: The registered base is spread across trading, services and manufacturing. **Trading** accounts for around **~4.08 crore registrations,** followed by **services** at **~3.77 crore** and **manufacturing** at **~1.93 crore.**



Operational Framework of the SME Growth Fund

Investment Structure and Selection

The SME Growth Fund is designed as a **direct equity investment fund** and will operate in the form of **Alternative**

What are AIFs?

An Alternative Investment Fund (AIF) is a **privately pooled fund** established in India that raises money from investors and invests it according to a **defined policy.**

Investment Fund (AIF) established under the SGF framework.

Strategic Focus of the SME Growth Fund

- **Manufacturing at the Core:** A major share of the SME Growth Fund's allocations will be directed towards **small and medium manufacturing-focused enterprises.**

The Fund is intended to support firms seeking to expand **manufacturing capacity,** adopt **advanced technologies,** improve **productivity** and strengthen **export competitiveness.**

- **Extending Growth to Industrial Clusters:** The Fund will also consider SMEs operating in industrial clusters in **Tier-II and Tier-III cities.**

This is expected to support balanced **regional industrial development,** strengthen **local supply chains** and generate **quality employment opportunities.**

Why SMEs Need a Dedicated Growth Fund?

Despite the wide presence of MSMEs across the economy, existing equity funds largely focus on early-stage enterprises covering Micro enterprises. This creates scope to further expand access to growth equity capital for Small and Medium Enterprises.

Such capital becomes important as SMEs seek to scale further. It can also help enterprises navigate **critical inflection points in their growth journey** and move towards greater scale and competitiveness. These investments can support promising SMEs in developing into industry leaders.

How Long-Term Growth Capital Enables SME Expansion	
Scale operations	Undertake acquisitions
Foster innovation	Integrate into global value chains
Adopt advanced technology	Undertake strategic investments
Invest in manufacturing capacity	Expand into international markets



Impact on Innovation, Growth and Employment

The Fund is expected to strengthen the growth of high-potential SMEs across key sectors. Its impact aims to extend to enterprise scale-up, competitiveness and employment generation.

It is expected to **support enterprises operating in sectors of national importance.**

It will also help SMEs **expand capacity** and **scale operations**, supporting **employment generation.**

The initiative aims to build a **strong pipeline of Indian companies** with the scale, manufacturing capability and competitiveness required to become **sectoral champions.**

A Broader Support Ecosystem for MSMEs

MSMEs receive support across several areas, including finance, employment generation, skills, technology, end-to-end assistance and public procurement.



Focus Area	Key Implementing Schemes
Credit and Finance Support	Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE)
Employment generation	Prime Minister's Employment Generation Programme (PMEGP)
End-to-end support	PM Vishwakarma
Training and Entrepreneurship Development	MSME Skilling, Entrepreneurship and Skill Development Programme (ESDP), ASPIRE
Technology Infrastructure and Enablement	Raising and Accelerating MSME Performance (RAMP), Zero Defect (ZED) Scheme, Tool Room and Tech Centre
Public Procurement	MSME SAMBANDH, SC/ ST Hub



Conclusion

The SME Growth Fund complements ongoing efforts to strengthen the SME sector through reforms, digitalisation, credit support and ease of doing business measures. By catalysing investments, the Fund will promote innovation-led industrialisation while advancing the vision of Atmanirbhar Bharat and Viksit Bharat@2047.

This support for smaller enterprises reflects India's broader effort to make growth more inclusive, with opportunities extending across the country.

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Green Hydrogen

Emerging Pillar of India's Clean Energy Transition

Published on: 28 October 2026

Click here for Hindi

Green hydrogen is emerging as a pillar of India's clean energy transition. It is produced by splitting water using renewable electricity. It can help reduce emissions in sectors such as fertiliser production, petroleum refining, iron and steel manufacturing, heavy-duty road transport and shipping. The National Green Hydrogen Mission (NGHM) supports domestic manufacturing, production, assured demand and credible certification. From green ammonia auctions to India's first hydrogen train, early projects point to a promising path.

Why Green Hydrogen

Hydrogen is an energy carrier that stores energy and delivers it for varied uses. In a fuel cell, it reacts with oxygen to produce electricity, leaving only water and heat as by-products, and no polluting compounds or greenhouse gases. Although pure hydrogen is not found in large quantities in nature, it can be extracted from compounds such as water or natural gas. Its environmental impact therefore depends on how it is made. Conventional methods rely on fossil fuels and release carbon emissions.

Production using renewable electricity from solar and wind power can cut this footprint substantially. Hydrogen made by splitting water using renewable power is called **green hydrogen.** Unlike fossil-based routes, this process emits far less carbon. India's abundant solar and wind resources make domestic production feasible. This diversifies the country's energy sources and strengthens energy security. It also supports India's goal of net-zero emissions by 2070.

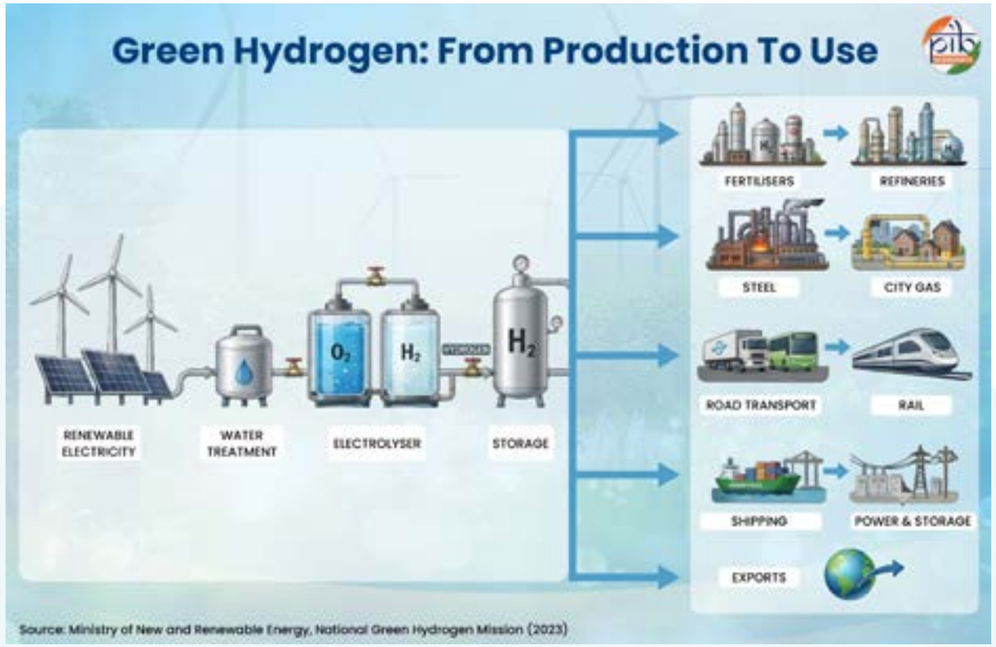
Green hydrogen matters most in sectors where cutting emissions is difficult. Reasons include high-temperature heat needs, chemical processes and few alternatives to fossil fuels. **These hard-to-abate sectors** include fertiliser, petroleum refining, iron and steel, heavy-duty road transport and shipping. Fertiliser and refining plants already use hydrogen, so green hydrogen can replace the fossil-based supply. It can also support lower-emission steelmaking, selected transport uses and energy storage. It is especially useful where direct electrification is difficult or less practical.

For India, wider adoption could reduce dependence on imported fossil fuels. It would also lessen exposure to global fuel price swings. The sector could open opportunities in manufacturing, draw investment, create jobs and expand exports. Building capabilities across the value chain would strengthen domestic supply chains and spur industrial innovation. Green hydrogen can thus support self-reliance, sustainable industrial growth and a low-carbon future.

What Makes Hydrogen "Green"

Hydrogen releases no carbon dioxide when used, so its climate impact depends on how it is produced. In August 2023, the Ministry of New and Renewable Energy (MNRE) notified India's Green Hydrogen Standard. Hydrogen qualifies as green if emissions do not exceed 2 kg of CO_2 equivalent per kg of hydrogen, on a well-to-gate basis, measured as a 12-month average. India thus became one of the first few countries to define green hydrogen formally.





How Is Green Hydrogen Produced?

Green hydrogen is produced mainly through water (H_2O) electrolysis. Electrolysis uses electricity to split a compound into simpler substances. Here, renewable electricity splits water into hydrogen (H_2) and oxygen (O_2), with minimal emissions.

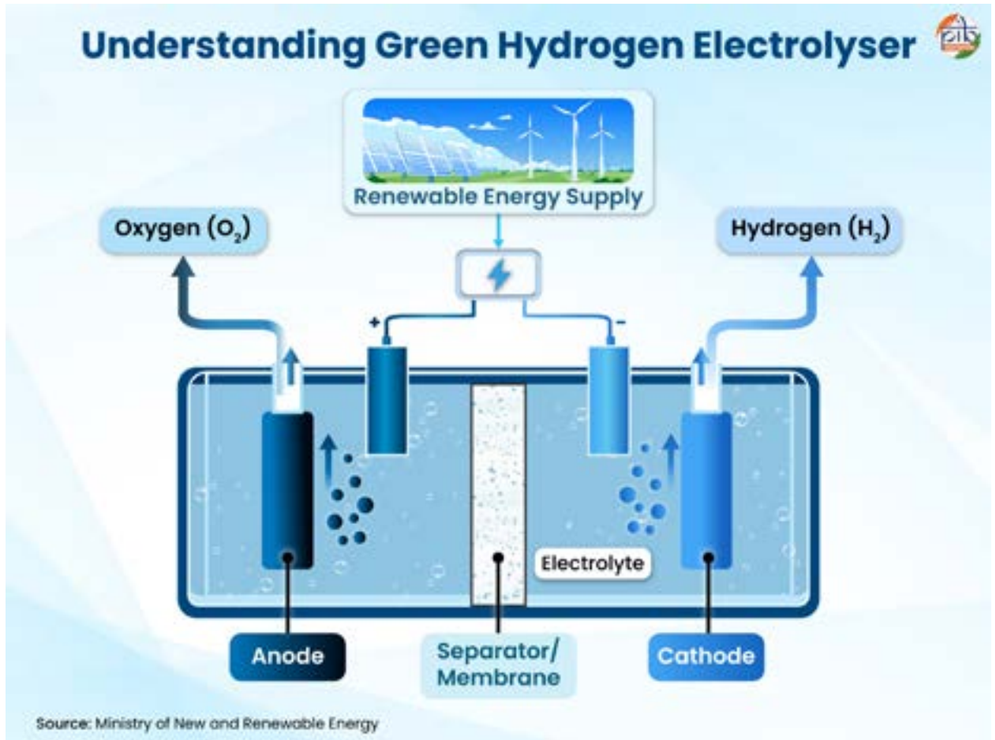
$2H_2O \rightarrow 2H_2 + O_2$

The key equipment is the **electrolyser.** It contains **two electrodes,** a cathode and an anode, connected to a power source. They operate within an **electrolyte,** which helps ions move through the cell. A **diaphragm** keeps the gases apart while allowing ions to pass. When **current flows,** hydrogen forms at the cathode and oxygen at the anode. The gases are collected separately for further usage. An electrolyser thus turns renewable electricity and water into a low-emission fuel for industry, transport and other uses.

Did You Know?

Water is purified before electrolysis, because impurities can damage cells and shorten their life. According to MNRE, about nine litres of demineralised water is needed per kg of hydrogen. Afterwards, the hydrogen is dried and purified before compression. India's Green Hydrogen Standard counts emissions from each of these steps.





Applications of Green Hydrogen

- **Fertilisers:** Ammonia, made from hydrogen and nitrogen, is the base for nitrogen fertilisers such as urea. Most of this hydrogen now comes from natural gas. Green hydrogen can replace it and yield green ammonia with far lower emissions.
- **Petroleum refineries:** Refineries use hydrogen to remove sulphur from petrol and diesel, so the fuels burn cleaner. They also use it to upgrade heavy oil into lighter fuels such as diesel, aviation turbine fuel and naphtha. These fuels serve road transport, aviation and industry. Most refinery hydrogen comes from fossil fuels, so a green supply can cut refining emissions.
- **Steel:** Conventional steelmaking uses coal to strip oxygen from iron ore, releasing carbon dioxide. In direct reduced iron routes, green hydrogen can do this job instead. The reduction stage then releases water vapour in place of carbon dioxide.
- **City gas networks**: Green hydrogen can be blended with natural gas

in limited proportions, subject to safety standards and infrastructure compatibility. This allows existing gas networks to supply a hydrogen-natural gas blend to homes, businesses and industries. Such blending can reduce fossil fuel consumption and associated emissions while utilising existing distribution infrastructure.

- **Road and rail transport:** Fuel-cell vehicles convert hydrogen into electricity on board, which drives electric motors. Their only emission at the point of use is water vapour. This suits buses, trucks and trains that need long range and quick refuelling.

Did You Know?

India's first indigenous hydrogen-powered train was inaugurated on 17 July 2026 on the Jind–Sonipat section. The 10-car trainset can carry around 2,600 passengers. A facility at Jind stores nearly 3,000 kg of hydrogen. The train emits only water vapour and heat.



- **Shipping:** Green hydrogen can be converted into green ammonia and green methanol, which can fuel ships. These can replace conventional marine fuels on long voyages. Adoption depends on engine compatibility, safety requirements and port infrastructure.
- **Exports:** India can supply green hydrogen and derivatives, such as green ammonia and green methanol, to countries seeking low-emission fuels. India's renewable energy resources can support this supply. Exports can open industrial opportunities and strengthen India's position in low-emission fuels.

India's Green Hydrogen Policy Architecture

NGHM: A mission for the whole ecosystem

MNRE is implementing the NGHM to make India a global hub for green hydrogen and its derivatives. The Union Cabinet approved the Mission in January 2023 with an outlay of Rs19,744 crore. It targets production capacity of at least 5 million metric tonnes (MMT) annually by 2030. With export demand, this could reach 10 MMT per year. The Mission has the following components.

Bringing Cohesion in Government Approach

The Government has adopted an integrated strategy to increase the adoption of Green hydrogen across the sector. It coordinates with Central and State Ministries, Departments, agencies and institutions to drive adoption. Each Ministry has a defined role. For example, **Ministry of Petroleum and Natural Gas** promotes use in refineries and city gas distribution; **Ministry of Chemicals and Fertilisers** encourage indigenous green ammonia-based fertilisers; **Ministry of Road Transport and Highways** enable transport use through regulations, standards and codes; **Ministry of Steel** drives adoption in steelmaking; **Ministry of External Affairs** facilitates collaboration with global partners.

SIGHT: Support on both sides of the market

The Strategic Interventions for Green Hydrogen Transition (SIGHT) Programme is a key NGHM component. Its outlay is Rs17,490 crore up to 2029–30. It offers incentives for two purposes: domestic electrolyser manufacturing and green hydrogen production. Together, they strengthen indigenous capability and speed up production.

Key Progress

- Incentives have been awarded to 15 companies for 3,000 MW per annum of electrolyser manufacturing capacity. This reduces dependence on imported supply chains.
- About 8,000 tonnes per annum of green hydrogen capacity had been commissioned by February 2026.
- Incentives have been awarded for 8,62,000 tonnes per annum of green hydrogen production capacity.

Pilot Projects

The NGHM supports pilots that replace fossil fuels and feedstocks in hard-to-abate sectors. These include steel, heavy-duty mobility and shipping. The pilots aim to identify technological, regulatory and infrastructure gaps. They will also test supply chains and technology integration. Their findings will guide commercial-scale deployment and the policy support needed. The Mission has earmarked Rs455 crore for low-carbon steel up to 2029–30. It has also earmarked Rs496 crore for mobility and Rs115 crore for shipping up to 2025–26.

address this, the Mission promotes hubs and HVICs. This cluster approach brings production, consumption and infrastructure together. It improves project viability and enables economies of scale. Projects in designated hubs can also access Central and State scheme benefits. The Mission has an outlay of Rs 400 crore up to 2025–26 for hubs and related projects. These initiatives aim to attract green investment and accelerate innovation.

Enabling Policy Framework

The Mission follows a whole-of-government approach to make green

Key Progress

- Five pilot projects have been sanctioned in the steel sector. Rs84 crore is sanctioned for testing 100% hydrogen injection.
- Twelve projects will deploy 70 hydrogen vehicles: 27 buses and 43 trucks. These include fuel cell electric vehicles (FCEVs) and hydrogen internal combustion engine (H_2-ICE) vehicles.
- The projects also cover 16 hydrogen refuelling stations across 21 routes. Financial assistance of Rs41.58 crore has been released.
- V.O. Chidambaranar Port Authority has awarded a pilot project to develop bunkering and refuelling facilities for green methanol. The project costs Rs 38.12 crore, including an MNRE grant of Rs 35 crore.

Green Hydrogen Hubs and Hydrogen Valley Innovation Clusters (HVIC)

Hydrogen is difficult to transport. To

hydrogen affordable. MNRE coordinates with Central and State departments on benefits and project facilitation. Key

Key Progress

- MNRE has recognised Deendayal Port (Kandla, Gujarat), V.O. Chidambaranar Port (Tuticorin, Tamil Nadu) and Paradip Port (Odisha) as hubs.
- An indigenously built 1 MW green hydrogen plant was commissioned at Kandla Port in July 2025.
- Four HVICs have been awarded: Jodhpur, Odisha, Pune and Kerala.

measures include waiving interstate transmission charges and facilitating renewable energy banking. They also include time-bound Open Access and grid connectivity. The Government will coordinate planning for renewable capacity, transmission, banking and

storage. Solar Parks, Manufacturing Zones and Special Economic Zones (SEZs) may be extended to hydrogen facilities. The Mission will also explore international green finance, green bonds and innovative financing.

Key Progress

- Green hydrogen and green ammonia plants commissioned by 31 December 2030 are **exempt from Inter-State Transmission System (ISTS)** charges for 25 years. ISTS are fees for moving power across state boundaries. The waiver lowers electricity costs.
- The **Green Energy Corridor Scheme** supports lines and substations that carry renewable power to the grid. A national transmission plan improves links between generation and consumption centres.
- **Duty benefits** under Section 26 of the Special Economic Zones Act, 2005, have been extended to eligible units installing and operating renewable energy equipment exclusively for captive consumption. This can reduce the cost of setting up renewable energy facilities within SEZs to meet their own electricity requirements.

- Standalone plants producing green hydrogen or green ammonia through water electrolysis using renewable energy have been **exempted from prior Environmental Clearance** under the Environment Impact Assessment Notification, 2006. This can simplify the approval process for eligible projects.
- Renewable energy plants located within a Special Economic Zone (SEZ) or Export Oriented Unit (EOU) are **exempt from the Approved List of Models and Manufacturers (ALMM) and Revised List of Models and Manufacturers (RLMM) requirements** when supplying electricity exclusively to green hydrogen production plants or their derivatives. This provides eligible projects greater flexibility in sourcing renewable energy equipment, subject to the applicable exemption conditions.
- The Green Hydrogen and Green Ammonia Policy provides for **Open Access within 15 days and banking of surplus renewable electricity for up to 30 days,** subject to applicable provisions. Open Access allows producers to procure renewable electricity from sources other than their local distribution company. Banking allows surplus electricity to be stored as a credit and used later, subject to applicable regulations.

Regulations and Standards

The Mission is building regulations and standards aligned with industry needs. The aim is to enable sector growth and harmonise with international norms.

Research and Development

The Mission supports research and development (R&D) to make green hydrogen more affordable, efficient, safe and reliable. The Strategic Hydrogen Innovation Partnership (SHIP) is a public-private framework, with a dedicated R&D fund from industry and Government. Scheme guidelines for R&D were notified in March 2024, with an outlay of Rs 400 crore. As of June 2026, an initial R&D roadmap worth Rs 113 crore is supporting approved projects across hydrogen production, storage, and safety technologies.

Skilling

A coordinated skill development initiative is under way. The Mission aims to generate over 6 lakh jobs across the value chain by 2030. So far, 8,149 candidates have been trained and 7,248 certified in hydrogen-related qualifications across 14 States and Union Territories. Training spans renewable power for electrolysers, electrolysis, storage, transport, safety standards and end use such as steel, mobility and refining. For innovation, Rs 100 crore has been allocated to start-ups working on green hydrogen technologies. The first nine start-ups have been approved, with total funding of Rs22 crore.

International Cooperation

The Mission promotes partnerships to develop technology, mobilise investment, build export markets and align standards.

Key Progress

- India's Green Hydrogen Standard has been notified. It sets a ceiling of 2 kg CO_2 equivalent per kg of hydrogen, well-to-gate, averaged over a 12-month period. This created a common benchmark.
- Scheme guidelines have been issued to fund testing facilities, infrastructure and institutional support for standards.
- Standards for green ammonia and green methanol have been notified. They set emission thresholds and eligibility conditions, supporting production and trade.
- MNRE launched the **Green Hydrogen Certification** Scheme of India in April 2025. The Bureau of Energy Efficiency (BEE) accredits agencies for monitoring, verification and certification.
- A dedicated portal went live in June 2026 for transparent certification and compliance. Credible certification will help Indian producers compete with confidence globally.

Key Progress

- MNRE, directly or through the National Institute of Solar Energy, has signed MoUs, Letters of Intent or Joint Declarations of Intent. The partners are

Australia, Finland, France, Germany, Saudi Arabia, the UAE and Uzbekistan.

- An MoU on renewable energy has been signed with the Netherlands.
- An India–US Hydrogen Task Force has been formed under the Strategic Clean Energy Partnership.
- Green hydrogen is a focus area of the India–US New and Emerging Renewable Energy Technology Action Platform (RETAP).

State-level Initiatives

Six States have notified dedicated green hydrogen policies, complementing the National Green Hydrogen Mission. **Gujarat, Andhra Pradesh, Maharashtra, Uttar Pradesh, Rajasthan and West Bengal** are the States with notified dedicated policies.

Four more States are finalising their dedicated green hydrogen policies. Haryana, Punjab, Bihar and Keralam are working on the draft policies.

Seven States have integrated hydrogen into their existing industrial and renewable energy policy frameworks. These include Himachal Pradesh, Madhya Pradesh, Odisha, Telangana and Chhattisgarh.

The Road Ahead

The National Green Hydrogen Mission marks an important step towards building a cleaner, more self-reliant and globally competitive energy economy. By 2030, India aims to develop **5 million metric tonnes (MMT) of annual green hydrogen production capacity.** This transition can reduce dependence on imported fossil fuels and strengthen the country's long-term energy security. The Mission is expected to reduce cumulative fossil fuel imports by approximately **Rs1 lakh crore by 2030.**

Beyond energy security, the Mission seeks to create new opportunities for industrial growth, investment and employment. It is expected to mobilise over **Rs8 lakh crore in investments** and generate more than **6 lakh jobs across** manufacturing, infrastructure, research and project development. The production and use of the targeted green hydrogen quantum could also help avert nearly **50 MMT of carbon dioxide emissions annually.** Through these efforts, the Government aims to accelerate industrial decarbonisation, strengthen domestic manufacturing and position India as a global hub for green hydrogen production, use and exports. This will contribute to India's broader vision of **Viksit Bharat by 2047** and its commitment to achieving **net-zero emissions by 2070.**

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Catch the Rain

A Renewed National Call for Water Conservation

Published on: 26 October 2026

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Catch the Rain Campaign at a Glance

Catch the Rain is a nationwide campaign focused on **rainwater harvesting, groundwater recharge,** and **water-body restoration**. The campaign encourages communities and institutions to conserve rainwater and strengthen water security. It promotes cleaning of ponds and water reservoirs to maximise monsoon water retention. It also encourages **afforestation** to enhance green coverage in water retention areas.

Key water conservation actions recommended during this campaign are:

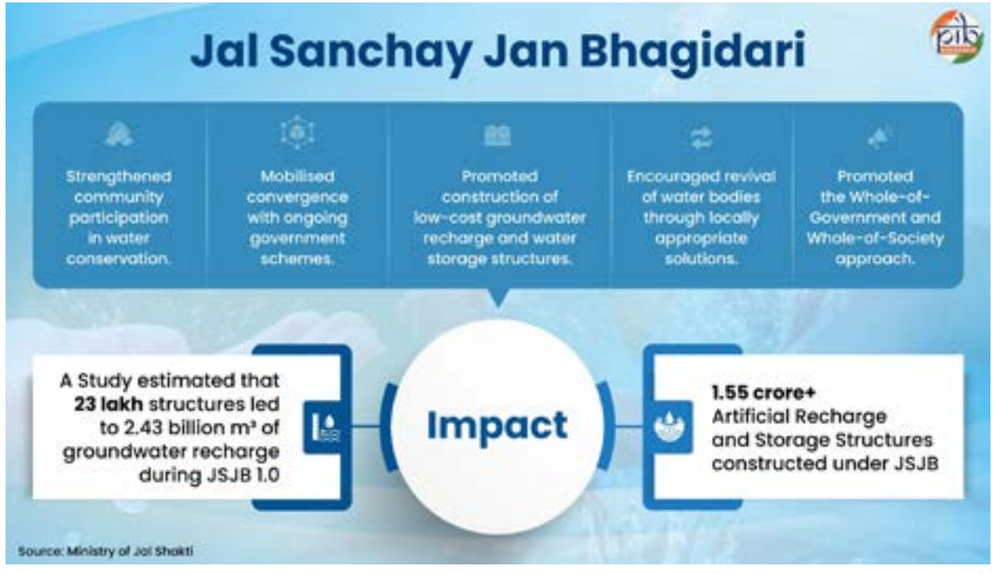
- Adopt rainwater harvesting systems in homes, societies and workplaces.
- Install recharge pits and shafts at suitable locations.
- Repair unused borewells to facilitate groundwater recharge.
- Restore baolis, wells and traditional water bodies.
- Desilt ponds and reservoirs to enhance water retention.
- Promote tree plantation in water retention and recharge areas.

Jal Sanchay Jan Bhagidari (JSJB) 1.0 (2024)

Jal Sanchay Jan Bhagidari 1.0 **strengthened community participation** in water conservation. JSJB 1.0 was implemented from 1 April 2024 to 31 May 2025. The initiative followed the principles of **Community, CSR, and Cost - the 3Cs**. It also mobilized **convergence with ongoing government schemes** to accelerate water conservation efforts. The initiative promoted **low-cost** groundwater recharge and water storage structures. It also supported the **revival** of defunct borewells and **locally appropriate** solutions. The structures were developed through a Whole-of-Government and Whole-of-Society approach. During this campaign, more than **10 lakh** groundwater recharge structures were constructed, with more than **27 lakh** artificial recharge structures reported.

Jal Sanchay Jan Bhagidari 2.0 (2025)

Jal Sanchay Jan Bhagidari 2.0, launched on 1 June 2025, built upon the earlier initiative. It focused particularly on groundwater recharge in **over-exploited and critical districts.** The approach emphasised **low-cost** and **hyper-local interventions.** In November 2025, exemplary contributions under JSJB 1.0 were recognised during the **6th National Water Awards.**



Impact Evaluation and Achievement of JSJB Initiative

Under the Jal Sanchay Jan Bhagidari (JSJB) initiative, over **1.55 crore Artificial Recharge and Storage Structures** have been constructed. Further, an Impact Evaluation Study of JSJB 1.0 was conducted, which evaluated **23 lakh structures** using rainfall data between 1 June 2025 and 31 December 2025. The study estimated that these interventions have resulted in **2.43 billion cubic metres of groundwater recharge.**

Jal Sanchay Jan Bhagidari: Catch the Rain (JSJB: CTR) (2026)

The 2026 initiative, launched on June 1,2026, expanded the JSJB approach by **integrating it with the Jal Shakti Abhiyan: Catch the Rain campaign.** The campaign focused on rainwater harvesting, groundwater recharge, water conservation, creation of water assets, and community participation. It promoted locally appropriate, low-cost interventions and strengthened **climate resilience** through sustainable water management.

The campaign leveraged **convergence across several government schemes** like VB-G RAM G, Per Drop More Crop under PM Krishi Sinchayee Yojana (PMKSY), Repair, Renovation and Restoration of Water Bodies under PMKSY, CAMPA, Finance Commission Grants and other state government schemes. The initiative brought together Panchayati Raj Institutions, urban local bodies, women's groups, youth, educational institutions, civil society organisations and local communities. These stakeholders support **planning, implementation** and **community-led water conservation. JSJB: CTR portal** and **mobile application** have been instrumental in strengthening transparency, monitoring and facilitating public feedback.

Jal Shakti Abhiyan: Catch the Rain (JSA: CTR)

Jal Shakti Abhiyan: Catch the Rain was launched on **22 March 2021** on **World Water Day**. Its guiding theme was: **"Catch the Rain, Where It Falls, When It Falls."** The campaign builds on the success of **Jal Shakti Abhiyan 2019**, which covered 1,592 water-stressed blocks across 256 districts for promoting rainwater harvesting. It also promoted groundwater recharge, watershed development, rejuvenation of water bodies, afforestation, and community participation through a **Jan Andolan** approach. The campaign has since been **implemented annually with evolving themes and focus areas:**

Year	Theme / Focus	Key Areas of Activity
2021	**Catch the Rain, Where It Falls, When It Falls**	Rainwater harvesting & water Conservation; Geo-tagging of water bodies; Scientific water conservation planning; Jal Shakti Kendras and awareness activities
2022	**Expanding Water Conservation Activities**	Restoration of traditional water bodies; Groundwater recharge and watershed development; Wetland and river rejuvenation; Spring-shed development and catchment protectionl
2023	**Source Sustainability for Drinking Water**	Focus on 150 water-stressed districts; Strengthening drinking water sources; Groundwater recharge and source sustainability; Field monitoring and community participation
2024	**Nari Shakti se Jal Shakti**	Women-led water conservation initiatives; Desilting and cleaning of water bodies; Revival of abandoned borewells for recharge; Afforestation and rejuvenation of local water resources

The 2024 campaign highlighted women-led water conservation initiatives. Their contributions continue to be recognized through the **Swachh Sujal Shakti Samman**, celebrating exemplary efforts in water conservation, sanitation, and hygiene.

Jal Shakti Kendras

Jal Shakti Kendras (JSKs) serve as **district-level knowledge and facilitation hubs**. They support communities and local administrations through:

- Providing information on water harvesting techniques
- Providing technical guidance
- Supporting water conservation planning and implementation

From Rainwater Harvesting to Rural Resilience

Water conservation has evolved into a community-driven movement focused on sustainable water management. Initiatives such as Catch the Rain and Jal Sanchay Jan Bhagidari promote rainwater harvesting, groundwater recharge, and restoration of water bodies. Scientific planning, local ownership and convergence of resources are strengthening water security, rural livelihoods and climate resilience. By linking community ownership with convergence, digital oversight, and asset creation, **JSJB: CTR is laying the foundation for a water-secure Bharat.**

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Urban Transformation: Building Greener, More Sustainable Cities

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A city's growth is visible not only in its buildings and roads, but also in how it responds to everyday challenges. The way waste is handled, communities participate and services are delivered can shape the quality of urban life. The Swachh Bharat Mission has given this everyday transformation a strong foundation across the country. Over time, the focus has moved beyond simply collecting and disposing of waste. Cities are finding ways to recover value from discarded material, encourage responsible habits and make municipal services more efficient. Green practices are also gaining ground as segregation, recycling, reuse and recovery become integral to local systems. Digital monitoring, data-driven systems and better service delivery are helping local bodies to work with greater precision. These efforts are gradually creating urban spaces that balance environmental responsibility with the needs of everyday life.

Cities Leading the Way in Sustainable Urban Transformation

Across different regions, cities are demonstrating how local solutions can translate into meaningful environmental outcomes. Their experiences show that sustainable urban transformation can take many forms. These include converting dumping grounds into integrated waste management facilities and promoting zero-waste practices. Technology is also improving everyday sanitation services and strengthening urban systems. The following stories highlight these diverse approaches.

A Greener Goa: Turning Waste into Energy

Located in the valleys of Saligao, Goa, the Integrated Waste Management Facility Center promotes environmental sustainability. Spread across **113,000 square metres,** it is operated by the Goa Waste Management Corporation (GWMC). The facility was formerly used as a garbage dump. It has now been transformed into an integrated, eco-friendly waste management hub for Goa. The center manages **250 metric tons** of wet and dry waste every day. At this plant, organic matter is separated from waste and converted into biogas, which helps **generate electricity.**



Integrated Waste Management Facility Center

This energy supports the needs of the local community by alleviating power shortages in the area.

Wet waste from restaurants is converted into valuable bioproducts, including methane-rich biogas. Recyclable materials are recovered from **100 metric tons** of dry waste processed at the facility. The remaining dry waste is sent to cement factories for co-processing. Additionally, 1.32 kilowatts of electricity is generated from wet waste at the facility. This electricity powers 35 units, with half supplied to the Goa Electricity Department. The plant also generates 7–8 tons of compost daily. Local panchayats use this compost for gardening and reforestation projects.

The integrated solid waste management facility is strengthening Goa's waste management system, processing approximately **one-third of the state's total waste**. People who once merely collected waste are now part of the plant's trained workforce. This provides livelihood opportunities for several families in the region while benefiting the environment. The plant operates continuously throughout the year, aiming to make the city "zero waste".



Electricity Generation of 1.02 MW per day

Gandhinagar's Zero-Waste Journey: Citizens Driving Change

Gandhinagar in Gujarat stands as a strong example of swachhata and sustainability. Through its commitment to the Swachh Bharat Mission and participation in Swachh Survekshan, the city promotes a culture of cleanliness. Inspired by the global **Zero Waste Week** movement, the Gandhinagar Municipal Corporation organised impactful activities from 2nd to 7th September, 2026. These initiatives aimed to encourage behavioural change and promote the 3R principles: **Reduce, Reuse and Recycle.** Activities were conducted at 25 locations across the city, directly engaging more than 600 citizens. Targeted social media campaigns further reached and sensitised over **40,000 individuals** during the week. The My Theli stalls became vibrant spaces for community participation and sustainable action across Gandhinagar. Citizens were encouraged to donate used clothes. Skilled women from local self-help groups transformed these donations into reusable carry bags.

The **"Swachhata Se Shuruvat"** campaign was launched to encourage

responsible practices among school students. Quiz competitions were organised to raise awareness about environmental concerns and responsible practices. Engaging and interactive games were designed through which students gained practical insights into sustainability. The Reduce, Reuse, Recycle van visited residents at their doorsteps to collect old clothes, plastic and electronic waste. Participants received rewards for their donations, encouraging greater community involvement. Citizens were also invited to share their personal efforts and daily practices through online testimonials. Through these initiatives, Gandhinagar is advancing its zero-waste vision. The city continues to strengthen resource-conscious practices while working towards the goal of Garbage Free Cities.



School Students participate in Swachhta Campaign



RRR Van

Kakinada's Smart Approach to Efficient Waste Management

In Andhra Pradesh's East Godavari District, Kakinada has emerged as a notable example of technology-enabled waste management. Kakinada generates around **144 tons** of waste daily, comprising wet, dry and hazardous materials. The Kakinada Municipal Corporation manages this operation across 50 wards, which are further divided into 382 micro pockets. Each micro pocket covers 250 to 350 households and is managed by two sanitation workers.

With around **112,993 households,** over 973 sanitation workers have been employed to manage waste. These households are strategically organised into **40,661** designated waste collection points across the city. Digital tools are used to streamline waste collection and transportation. The Online Waste Management System (OWMS) tracks the process in real time. Radio Frequency Identification (RFID), facial recognition, GPS and a human resource management system (HRMS) further support workforce and transportation management. **RFID chip-enabled tags** are installed at the gates of every waste generator. Collectors scan these tags when waste is picked up. The scanned information is recorded in the OWMS, enabling officials to monitor collection progress. Continuous monitoring and dedicated sanitation staff have helped the system achieve **100% door-to-door collection.**



RFID tags scanning by SafaiMitras

The Municipal Corporation has deployed 108 hopper vehicles equipped with GPS tracking devices. These monitor the transportation and report deviations during waste collection and transportation to processing plants. It has also introduced a **Facial Recognition System (FRS)** for all SafaiMitras. Workers can now record their attendance using facial recognition technology. This eliminates the need for manual attendance registers or fingerprint scanners. All these technologies are integrated into a Central Command Centre for close monitoring. Around 60% of residents now segregate waste at source. The combined efforts of sanitation workers and residents are strengthening Kakinada's ability to manage its waste efficiently.



Garbage Transfer Station at Kakinada

Ghaziabad: Turning Waste into Carbon Value

Ghaziabad, Uttar Pradesh, is advancing cleanliness and urban development while taking steps to reduce carbon emissions. The Ghaziabad Municipal Corporation (GMC) has registered for an international carbon credit project. The initiative is verified by the United Nations and combines environmental protection with potential financial benefits. Improved solid waste management under the Swachh Bharat Mission can **reduce greenhouse gases** such as

methane from dumping sites.

Greater use of clean fuels and energy sources can also lower dependence on fossil fuels and reduce carbon emissions. In line with these efforts, the Ghaziabad Municipal Corporation has demonstrated its commitment to the Sustainable Development Goals. It has been accredited under the **Verified Carbon Standard (VCS),** supported by the United Nations Framework Convention on Climate Change (UNFCCC).

The GMC has replaced old streetlights across the city with energy-efficient LED lights. This measure reduces carbon



LED Street Lights to Reduce Carbon Emissions

can be converted into revenue by being sold on the international carbon market. The initiative supports cleanliness, environmental protection and economic opportunities for Ghaziabad.

Building Cities That

emissions while also lowering electricity consumption. It is also adopting "wet waste composting" to produce compost from wet waste. This process supports faster waste management and helps reduce greenhouse gas emissions. Following Indore in Madhya Pradesh, Ghaziabad is set to become the first urban local body (ULB) in Uttar Pradesh and the second in the country to turn waste into a new source of value.

Together, these measures are expected to reduce carbon dioxide emissions by approximately **2.7 lakh tonnes.** This reduction corresponds to **2.7 lakh carbon credits,** with one tonne of carbon dioxide equivalent to one credit. Certified credits



Wet Waste Composting

Value Every Resource

The transformation underway across cities reflects a broader shift in the way urban resources are managed. Technology is strengthening everyday sanitation services while citizens are becoming active participants in sustainable practices. Local solutions are creating visible improvements in everyday urban life. They also show the value of combining innovation with people's efforts for effective waste management. Together, these approaches point towards urban systems that are not only cleaner, but also more circular and resource-efficient.

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PM-SETU: One Year of Transforming India’s ITIs

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PM-SETU focuses on upgrading Government 1000 ITIs through a Hub-and-Spoke model and industry-aligned training. The scheme also provides for capacity augmentation of five NSTIs through National Centres of Excellence. Industry participation is incorporated through Strategic Investment Plans, Special Purpose Vehicles and Anchor Industry Partners. The scheme introduces new-age courses covering emerging technologies and occupations. International partnerships support advanced skilling at selected NSTIs. The initiative has also expanded implementation across States and Union Territories through State Steering Committees and industry participation. Its one-year progress includes the identification **of 850 ITIs and approval of 14 ITI clusters. Planned skill labs further extend vocational exposure to students.**

Transforming ITIs for a Skilled Workforce

India's Industrial Training Institutes (ITIs) form an important part of the country's vocational training ecosystem, providing youth with practical skills for employment and industry. **As workforce requirements evolve, strengthening the quality, relevance and industry orientation of vocational training has become increasingly important.**

Against this backdrop, **PM-SETU (Pradhan Mantri Skilling and Employability Transformation through Upgraded ITIs) was launched on 4 October 2025.** The scheme enhances the overall quality and relevance of vocational training by transforming Government ITIs into modern, industry-aligned training institutions. The initiative seeks to strengthen industry led governance, upgrade training infrastructure and promote demand-driven courses in line with evolving workforce requirements. The scheme has a total outlay of **₹60,000 crore**, comprising ₹30,000 crore from the Centre, ₹20,000 crore from States and ₹10,000 crore from industry. **The scheme completes one year on 4 October 2026**.

ITIs: Building the Foundation for a Skilled Workforce

ITIs provide vocational training to equip youth with practical skills for employment and industry. Under the **Craftsmen Training Scheme (CTS),** training is offered through Government and Private Industrial Training Institutes in engineering and non-engineering trades. Course duration varies from six months to two years, depending on the trade. The **Directorate General of Training (DGT), Ministry of Skill Development and Entrepreneurship (MSDE)**, is the apex organisation responsible for the development and coordination of vocational training at the national level. The functions include framing policies, norms and standards, curriculum development, affiliation, instructor training and trade testing. ITIs are under the **administrative and financial control of State Governments and Union Territory Administrations**.

The total number of ITIs, including Government and Private, in the country has increased from 9,776 in 2014 to 13,888 in 2026, **indicating an increase of 42%. Further, enrolment in ITIs** across the country has increased from 9.51 lakh in the academic session 2014–15 to 14.70 lakh in the academic session 2025–26, **indicating an increase of 54%**.

This expanding network provides a broad institutional base for strengthening vocational training and aligning it with evolving skill requirements across sectors.

How PM-SETU is Transforming ITIs

PM-SETU brings together infrastructure modernisation, industry participation, and new-age training to strengthen vocational education quality. The transformation is anchored in two distinct components, with the first focused on Government ITIs and the second on NSTIs.



- **Component I** covers **1,000 Government ITIs**, comprising **200 Hub ITIs and 800 Spoke ITIs.** These institutions are being upgraded through a Hub-and-Spoke model with modern infrastructure and industry-aligned training . Each Hub is connected with four Spokes on average, enabling shared access to advanced infrastructure, modern trades, digital learning systems and incubation facilities.

  Hubs provide facilities such as innovation centres, training-of-trainers infrastructure, production units and placement services. Spokes expand access to training and connect learners with the resources available within their respective clusters. This model is helping in upgradation of ITIs with smart classrooms, modern laboratories, digital content and industry-aligned courses.

- **Component II** focuses on the **capacity augmentation of 5 National Skill Training Institutes (NSTIs)** located in Bhubaneswar, Chennai, Hyderabad, Kanpur and Ludhiana. It includes setting-up sector-specific National Centres of Excellence and advanced training of trainers through global partnerships.

Implementing PM-SETU: State, Industry and Central Coordination

- The respective **States and Union Territories** lead the selection of ITIs under PM-SETU in consultation with industry. They **submit proposals for ITI upgradation in collaboration with industry partners.** This process considers emerging skill requirements and the industrial potential of the respective regions.

- At the national level, the **MSDE has constituted a National Steering Committee (NSC),** chaired by the Secretary, MSDE, to provide overall direction for the scheme. The NSC facilitates broad policy direction, finalises operational guidelines, monitors implementation and undertakes course correction where required.

- **Industry participation is also built into the selection process,** with prospective partners required to submit a Strategic Investment Plan (SIP).

Industry-Led Governance through SPVs

PM-SETU provides for industry-led governance through **SPVs** for upgraded ITI clusters. The proposed structure provides **51% ownership to the Anchor Industry Partner,** while the Centre and State Governments hold 24.5% each.

The SPVs lead cluster development and operations while proposing interventions suited to local industry requirements. These interventions may cover curriculum, training delivery, infrastructure and industry exposure.

PM-SETU at One Year: From Planning to Implementation

Within the first year of PM-SETU, implementation has progressed from institutional preparation and ITI identification to the approval of ITI clusters and SIPs. **A total of 850 ITIs have been identified, comprising 172 Hub ITIs and 678 Spoke ITIs.** 36 States and Union Territories have identified clusters and created dedicated State budget heads. Meanwhile, 35 States and Union Territories have constituted their State Steering Committees to guide and oversee implementation. 26 States and Union Territories have also initiated the process of inviting industry participation.

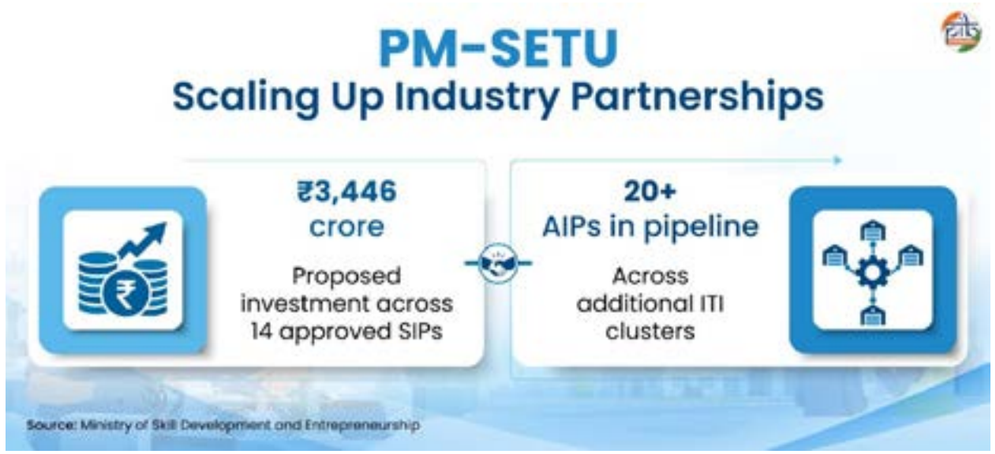
The NSC has also approved the **transition of PM-SETU from its pilot phase to a nationwide rollout across all 200 identified ITI clusters**. The rollout enables States and Union Territories to take up implementation based on industry readiness and implementation capacity.

Approval has been given to SIPs for **14 ITI clusters under PM-SETU with an investment of ₹3446 crore.**

14 SIPs across 8 States & 1 UT approved by National Steering Committee

No.	State	Cluster	Anchor Industry Partner (AIP)	Sector	Value (₹ Cr.)
1	AP	Kancharapalem	Arcelor Mittal Nippon Steel India	Steel & Metals	200
2	Odisha	Keonjhar-Barbil	Jindal Naveen Avsar Ltd (JNAL)	Diversified Manufacturing	240
3	Gujarat	Surat	Arcelor Mittal Nippon Steel India	Steel & Metals	240

4	Telangana	Old City	Apollo MedSkills Ltd.	Healthcare & Life Sciences	241
5	Telangana	Sangareddy	Neuland Foundation	Pharmaceuticals & Chemicals	241
6	Telangana	Patancheru	Sri Siddharth Infratech & Services	Diversified Manufacturing	275
7	Rajasthan	Bhiwadi	H.G. Infra Engineering Ltd	Infrastructure & Construction	241
8	UP	Meerut	National Skill Development Corporation (NSDC)	Skill Development	240
9	Telangana	Medchal	ZEN Technologies Ltd	Defence & Electronics	254
10	Haryana	Kurukshetra	Jindal Naveen Avsar Ltd (JNAL)	Diversified Manufacturing	320
11	Maharashtra	Chhatrapati Sambhaji Nagar	Belrise Industries	Automotive Industry	238
12	Maharashtra	Pune	BVG Group	Integrated Facility Management	241
13	Jammu & Kashmir	Srinagar	Inderdeep Infra India Limited	Infrastructure & Construction	235
14	Jammu & Kashmir	Jammu	Eagle Infra India Limited	Infrastructure & Construction	240
Total					**₹ 3,446 Cr.**



Expanding the Scope of Skilling

New-Age Courses for Emerging Workforce Requirements

To complement infrastructure and institutional reforms, PM-SETU also focuses on making vocational training responsive to emerging technologies and occupations. The **Directorate General of Training (DGT) has introduced 32 new-age courses** under the Craftsmen Training Scheme, covering areas such as **Artificial Intelligence, Cyber Security, Additive Manufacturing, Electric Vehicles, Semiconductor Technology, Robotics, Green Hydrogen, Drones, IoT, Solar Energy, 5G and Software Testing.** States can adopt these courses in their ITIs, which are under their administrative and financial control.

International Partnerships for Advanced Skilling

The PM-SETU framework also provides for international partnerships to strengthen the capacity of National Centres of Excellence for Skilling and align training with global standards. An MoU has been signed with Singapore for NSTI Chennai, France for NSTI Kanpur, Australia for NSTI Bhubaneshwar and a Joint Declaration of Intent has been exchanged with Germany for NSTI Hyderabad.

Strengthening the Pathway from Skills to Employment

PM-SETU is strengthening India's vocational training ecosystem through modern infrastructure, industry participation and demand-driven training. Its implementation is bringing Government ITIs and NSTIs closer to evolving workforce requirements. The initiative is also expanding access to new-age skills, international expertise and early vocational exposure. Together, these measures are supporting a more connected and industry-responsive skilling pathway for India's youth.

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PIB Research





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Carbon Capture, Utilisation and Storage

Powering India’s Industries Towards a Net Zero Future

Published on: October 27, 2026

Click here for Hindi

CCUS is an important pathway for reducing emissions from hard-to-abate sectors. Carbon dioxide is increasingly being viewed not only as an emission, but also as a potential resource. CCUS can support India's Net Zero by 2070 vision while strengthening industrial competitiveness and resource efficiency. The Government is fostering an ecosystem that brings together research institutions, public sector enterprises and private industry. This growing ecosystem spans operational projects, projects under execution and proposed initiatives across multiple States. These efforts are laying the foundation for indigenous CCUS capabilities, carbon utilisation and secure carbon storage.

CCUS Bridging the Gap in India's Net Zero Journey

India's journey towards Net Zero by 2070 requires reducing emissions across its energy and industrial sectors. Renewable energy can significantly lower emissions, but some industrial processes cannot be easily electrified. These include processes requiring very high temperatures or carbon-based inputs. **Carbon Capture, Utilisation and Storage (CCUS)** offers an additional pathway for addressing such emissions. It involves capturing carbon dioxide from industrial sources before its release into the atmosphere. The captured carbon dioxide can then be utilised in productive applications or stored securely underground. CCUS can therefore complement renewable energy and support India's transition towards a lower-carbon industrial economy.



NITI Aayog identifies CCUS as critical for decarbonising hard-to-abate sectors, including steel, cement, oil and gas, petrochemicals, chemicals and fertilisers. These industries contribute significantly to industrial emissions and face technological challenges in achieving deep decarbonisation.

CCUS can help reduce emissions from existing facilities while supporting the continued production of essential goods. It can also create opportunities for developing new technologies, infrastructure and industrial capabilities in India. By connecting carbon capture with utilisation and secure storage, the approach can address emissions across multiple stages. CCUS can thus support India's climate goals while maintaining industrial growth and economic development.

CCUS Process: From Capture to Storage

Step 1: Capturing Carbon Dioxide at the Source

The process begins at an industrial facility where carbon dioxide is generated. Capture systems separate carbon dioxide from gases released during fuel combustion or industrial processes. The captured gas is then purified, dried and compressed into a dense form before being transported or used.

Step 2: From Capture to Transport

Pipelines are commonly used to transport carbon dioxide over suitable distances. Ships and other transport modes can provide flexibility, especially for longer distances. The choice of transport depends on distance, volume,

Did You Know? A geological storage site is a secure, deep underground location used to permanently isolate captured CO_2. CO_2 geological storage (geo-storage) is a promising approach that can help to reduce greenhouse gas emissions.



infrastructure and the destination. The carbon dioxide can then be sent to a utilisation facility or geological storage site.

Step 3: Carbon Utilisation and Permanent Storage

At the final stage, captured carbon dioxide can either be put to productive use or stored permanently underground. It can be used in applications such as enhanced oil recovery, food and beverages, urea, green methanol and concrete. For permanent storage, carbon dioxide is injected deep underground into suitable geological formations, including depleted oil and gas reservoirs, deep saline aquifers and basaltic rock formations.

CCUS Hubs and Clusters Model

India's CCUS framework envisages **regional clusters and hubs** connecting multiple carbon dioxide emitters with shared infrastructure. This model can integrate common systems for carbon dioxide transport, utilisation and storage. Captured carbon dioxide can be collected from multiple sources and transported through shared networks. It can then be directed to suitable utilisation facilities or geological storage sites. **NITI Aayog** identifies the **hub and cluster approach** as suitable for India. The model can create economies of scale, reduce infrastructure risks and connect carbon dioxide supply with potential demand.

The **Department of Science and Technology's CCUS Roadmap 2025** identifies potential industrial and geological regions for such clusters. These include the **Gujarat coast,** with its concentration of refineries and chemical industries. The **Odisha–Jharkhand belt** offers potential for clusters linked to steel and cement industries. **Northeast India** also presents opportunities linked to its oil and gas resources. Such regional clusters can bring together emitters, transport infrastructure, utilisation facilities and storage sites. This approach can help develop a coordinated CCUS ecosystem suited to India's industrial landscape.

CCUS Advancing the Low Carbon Transition

India's low-carbon transition requires solutions that combine economic growth with deeper emission reductions. CCUS addresses this gap by managing carbon dioxide at source and creating opportunities for its reuse. It complements renewable energy expansion while opening applications across industry, hydrogen and carbon dioxide removal.

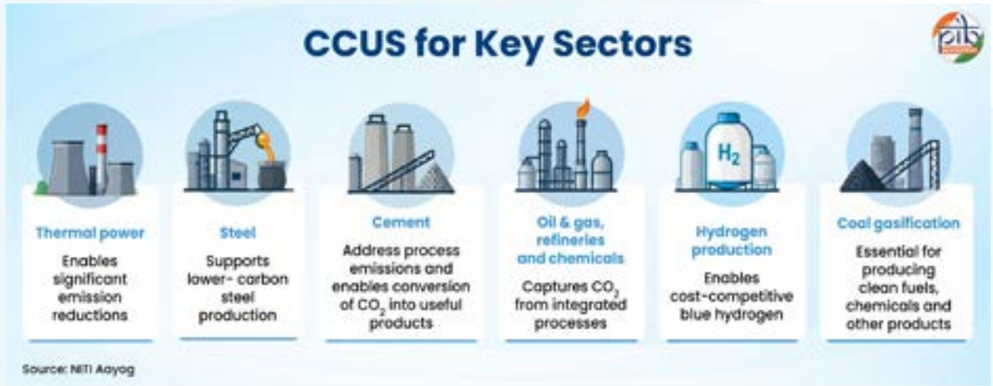
Decarbonising Hard-to-Abate Sectors

Hard-to-Abate Sectors (steel, cement, refineries/chemicals, fertilisers) release carbon dioxide directly from their processes. Their emissions can be difficult to eliminate through electrification (transition to renewables) alone. Emissions from these sectors and thermal power generation are expected to reach nearly 2,300 million tonnes per annum by 2030, making their capture and abatement critical. CCUS technology provides a means of addressing these emissions from ongoing industrial activity.

Did You Know? Green Hydrogen is produced by electrolysis of water using power generated from renewable energy sources. Blue Hydrogen is produced using natural gas or coal as the primary feedstock.

Enabling the Low Carbon Hydrogen Economy

CCUS is expected to play an important part in India's shift towards hydrogen, through blue hydrogen production using coal gasification coupled with carbon capture. This complements India's efforts to develop a low-carbon hydrogen economy.



Coal Gasification

Coal gasification converts solid coal into a clean, useful gas using controlled heat. This gas is called **synthesis gas, or syngas.** The process of producing it from coal is known as **coal gasification.** There are two established methods of doing this. **Surface coal gasification** processes mined coal in above-ground gasifiers. **Underground coal gasification** converts coal directly within the underground layer. In both cases, coal is not fully burned, unlike conventional combustion. Instead, it reacts with a limited supply of oxygen and steam. This takes place at high temperatures, typically between 800°C and 1,600°C. These conditions break coal's complex structure into simpler gases.

Sustaining Existing Energy Infrastructure

As of August 2026, fossil-fuel-based sources accounted for 45.12% of India's total installed power capacity. This existing infrastructure will remain part of India's energy system during the transition to cleaner sources. Managing emissions from these assets will therefore be important for achieving long-term climate goals. CCUS can support this effort by enabling existing thermal power plants and industries to reduce emissions. Steel and cement facilities can also potentially be retrofitted with CCUS systems. This can reduce carbon dioxide emissions while allowing essential energy and industrial infrastructure to continue operating.

Carbon Utilisation

Within the Carbon Capture, Utilisation and Storage framework, captured carbon dioxide can serve as a feedstock for materials, fuels, chemicals and biological products, creating pathways for both carbon management and industrial value. Applications include **building materials** such as concrete and aggregates, **synthetic fuels and chemicals, polymers, enhanced oil recovery** with underground carbon storage, and **algae-based products** including biofuels. These applications extend carbon dioxide utilisation across materials, fuels, chemicals and biological products, while improving resource efficiency.

India's First of Its Kind CCU Test Beds In Coal- Gasification Facilities

Through one of its recent interventions, **DST has supported two Technology Deployment Testbeds to be implemented by Industry-Research Consortia between IIT Delhi – Thermax Ltd and CSIR-IICT Hyderabad – BHEL** for setting up pilot-scale demonstrations in Coal Gasification plants for Methanol and DME production, with Industry partnering as a solution provider along with a Technology designer (knowledge partner) to deploy CCU in hard-to-abate sectors like Thermal power.



Launch of the 1.4 TPD DST-Supported CCU Test Bed in Coal Gasification Facilities in Pune, Maharashtra

India's First Integrated CCUS Field Laboratory

India's first integrated CCUS Field Laboratory at IIT Bombay, inaugurated in May 2026, brings carbon capture, utilisation and permanent geological storage together on a single pilot-scale platform. The indigenous facility can capture up to **3 tonnes of carbon dioxide per day** from industrial emissions and ambient air, using non-potable water, and convert it into advantageous carbonate and bicarbonate products. Scientific drilling in **Deccan Traps basalt formations** will further assess India's potential for safe and permanent carbon dioxide storage. The facility provides a **national testbed for developing and scaling indigenous carbon management technologies,** supporting Net Zero 2070 and solutions for hard-to-abate industries. Read more: India's First Integrated CCUS Field Laboratory Facility

Strengthening India's CCUS Ecosystem

The Government of India has undertaken initiatives spanning research, policy and industry to advance CCUS development and reduce emissions. These measures strengthen the foundation for India's Net Zero target by 2070.

- **Union Budget 2026–27, CCUS Scheme:** Announced in **February 2026,** the **Ministry of Finance** allocated **₹20,000 crore over five years** to promote **carbon capture, utilisation and storage** in five major industrial sectors: **Power, Steel, Cement, Refineries, and Chemicals.**

- **Department of Science & Technology- CCUS R&D Roadmap:** Launched in **December 2025,** the roadmap provides strategic direction for **CCUS research, funding, technology development and deployment,** with a focus on commercial readiness, breakthrough technologies and enabling frameworks.

- **NITI Aayog CCUS Policy Framework & Mechanism:** Released in November 2022, the report examines CCUS as an emissions reduction strategy for deep decarbonisation of hard-to-abate sectors and outlines sector-specific policy interventions for its deployment. Click to Access NITI Aayog Report

- **National CCUS Centres:** Established in 2022 at **IIT Bombay and JNCASR, Bengaluru,** with backing from the Department of Science and Technology, these centres focus on CCUS research, technology development, pilot-scale demonstration and industry collaboration.

- **India's CCUS Initiative:** Spearheaded jointly by the Department of Science and Technology (DST) and the Department of Biotechnology (DBT), India launched a major research drive on CCUS. As part of Mission Innovation , a global clean energy platform, India collaborated with 13 partner countries to advance technologies to capture, separate, safely store, and convert CO_2 into useful value -added materials.



Launch of DST CCUS R&D Roadmap on 2nd December 2025 by Prof. A.K. SOOD, PSA, GoI and Former Secy. DST Prof. Abhay Karandikar

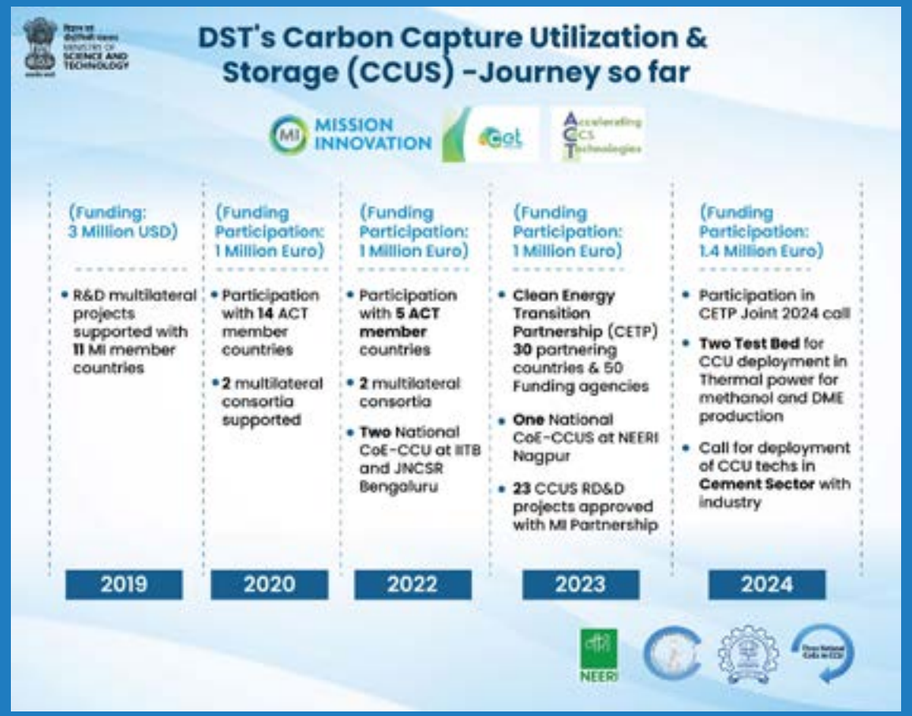
India Launches First Ever CCU Testbed Cluster for Cement Industry

India launched its **first cluster of five Carbon Capture and Utilisation** testbeds for the **cement industry** on 11th May 2025. Led by the **Department of Science and Technology (DST),** the initiative brings leading cement companies and premier research institutions together under a Public-Private Partnership model to develop and deploy industrial CCU technologies. The testbeds cover applications ranging from carbon dioxide capture and mineralisation to its conversion into concrete products, advancing practical CCU applications for cement sector decarbonisation.



The five CCU Test Beds in Cement Sector in Partnership with relevant industries and academic groups announced by the Hon'ble Minister of Science and Technology and Earth Sciences

Clean Energy Transition and Partnership (CETP) and Accelerating CCUS Technologies (ACT) are multinational platforms funded by EU and EC that have collective membership of more than 30 member countries and 50 funding agencies. DST, India has participated in the transnational platforms like Accelerating CCUS Technologies (ACT), and Clean Energy Transition Partnership (CETP), to support 4 multilateral consortia projects in the area of CCS and CCU. These projects engage both premier research institutions and industries to accelerate CCUS technologies to higher TRLs (Technology Readiness Levels). The year-wise CCUS journey of DST is enumerated below.



DST India plays an active role in advancing collaborative research and clean energy solutions across priority clean energy areas under the Mission Innovation platform. As of March 2025, **India has supported 25 CCUS research and development** projects **under Mission Innovation,** comprising **19 projects through the Department of Science and Technology and 6 through the Department of Biotechnology.**

India Accelerates on CCU

India has several CCU projects as of April 2026, spanning operational, under execution and proposed stages. The portfolio includes public sector enterprises, private industry, and academic institutions across multiple States. Projects focus on reducing carbon emissions, productive carbon utilisation and circular economy applications.

- **Operational:** Three projects are operational, with one each in **Madhya Pradesh, Tamil Nadu and Maharashtra.**

- **Under Construction/Execution:** Six projects are under construction or execution. **Andhra Pradesh leads with three projects,** followed by **Telangana with two and Maharashtra with one.**

- **Proposed:** Sixteen projects are at the proposed stage. **Assam and Odisha lead with four projects each,** followed by **Gujarat and Rajasthan with two each.** Andhra Pradesh, Madhya Pradesh, Haryana and Tamil Nadu have one project each.

The project pipeline reflects growing momentum towards carbon management solutions across India. It also provides a foundation for scaling indigenous Carbon Capture and Utilisation applications.

Shaping India's Low Carbon Industrial Future

India's Panchamrit commitments provide the broader context for advancing low-carbon growth and achieving Net Zero by 2070. CCUS adds an important technology dimension by addressing emissions from sectors where complete elimination remains challenging. Government initiatives spanning research, technology development, financing and demonstration are creating the foundations for wider deployment. As these efforts progress, CCUS could improve resource efficiency, support industrial decarbonisation, and help

develop a more circular carbon economy.

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India’s Mission for Aatmanirbharta in Pulses

Six-year plan to make India self-reliant in pulses by 2030-31

Published on: 11 October 2026

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From Import Dependence to Self-Sufficiency

India is the **world's largest producer** of pulses, a globally important, protein-rich food crop. Pulses contain **20-25% protein,** more than double that of wheat and nearly three times that of rice. Pulses contribute significantly to India's agricultural exports and remain a vital part of Indian diets, ensuring **nutritional security.** Recognising this importance, the government launched the **'Mission for Aatmanirbharta in Pulses'** on October 11, 2025. As the nation observes the first anniversary of the Mission's launch on October 11, this landmark initiative continues its momentum, backed by a financial allocation of ₹11,440 crore spanning 2025–26 to 2030–31. The Mission seeks to achieve **self-sufficiency** in pulses production. It focuses on boosting domestic production, reducing import dependence, and enhancing farmers' income through a comprehensive value-chain approach.

A Mission with a Clear Target

Under the Mission, by 2030-31, production is expected to reach nearly **350 lakh tonnes,** with yield rising to **1,130 kg per hectare.** Key strategic measures driving these targets include:

- Focus on enhancing production of **Tur, Urad and Masoor**
- Promotion of **climate-resilient seeds** and improved seed quality
- Distribution of **87.5 lakh free seed kits and 126 lakh quintals of certified seeds** over six years
- Expands pulse cultivation area by 35 lakh hectares to reach a total targeted area of 310 lakh hectares by 2030–31.
- **Cluster-based approach** covering 489 districts to intensify production
- Establishment of **1,000 processing units** (dal mills)
- **Assured procurement** of Tur, Urad and Masoor via **NCCF and NAFED from willing and registered farmer.**
- Expected to **reduce import dependence** and **conserve foreign exchange**

India's Pulse Powerhouse

India's pulse sector showed strong growth in domestic production, farming area, and crop yield during 2025-26. Steady agricultural progress and strong local output continue to strengthen the nation's pulse economy.

- India's total pulse production rose to **274.09 lakh tonnes** in 2025-26 (3rd Advance Estimates) from **256.83 lakh tonnes** in 2024-25.
- India's pulse cultivation area expanded significantly from **277.20 lakh hectares in 2024-25** to **286.46 lakh hectares in 2025-26.**
- The major regions of **Pulse cultivation** are Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, Gujarat, Andhra Pradesh, Karnataka, Jharkhand, Odisha and West Bengal.
- National pulse productivity improved as the overall yield increased from **926 kg per hectare in 2024-25** to **957 kg per hectare in 2025-26.**
- India's pulses imports declined by **31.52%,** from **₹46,427.60 crore in 2024-25** to **₹31,793.59 crore in 2025-26.**
- India's pulses exports rose **13.40%,** from **USD 855 million in 2024-25** to **USD 969.53 million in 2025-26.** The total export volume reached a total volume of **10.01 lakh tonnes** during 2025–26.
- In 2025-26, major export destinations included **China, UAE, Bangladesh, the U.S.A., and Sri Lanka**.



Rising MSP, Assured Procurement

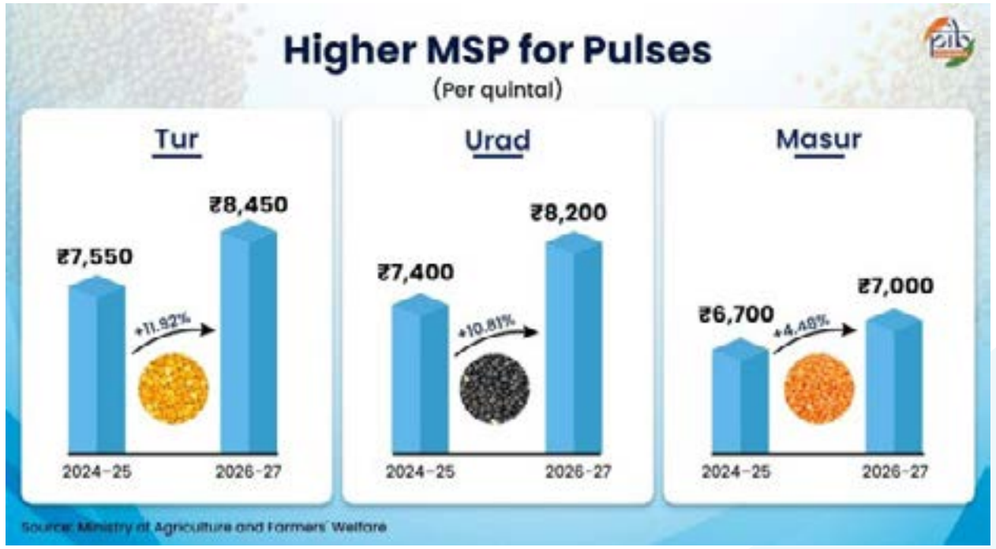
The government continues to strengthen price security for pulse farmers through substantial increases in Minimum Support Prices. Higher support prices ensure fair returns and incentivize increased domestic production of key pulse crops.

- For the marketing season **2024-25,** the Minimum Support Price (MSP) for **Urad** was fixed at **₹7,400** per quintal, which was increased by **₹800 (10.81%)** to **₹8,200** per quintal for **2026-27.**

- For the year **2024-25,** the MSP for **Tur (Arhar)** stood at **₹7,550** per quintal, which saw an enhancement of **₹900 (11.92%)** to reach **₹8,450** per quintal in **2026-27.**

- For the year **2024-25**, the MSP for **Masur (Lentil)** was set at **₹6,700** per quintal, which was revised upward by **₹300 (4.48%)** to **₹7,000** per quintal for **2026-27**.

Under the Mission, National Cooperative Consumers' Federation of India Limited (NCCF) and National Agricultural Cooperative Marketing Federation of India Limited (NAFED) are authorized to procure 100% of Tur, Masur, and Urad for a period of four years (2025–26 to 2028–29). As of June 17, 2026, key achievements from the NCCF Pulses Procurement Dashboard include:



- NCCF achieved a total pulses procurement of **10.55 lakh tonnes** across 9 states. A total Minimum Support Price (MSP) value of **₹7,047 crore** was released directly to farmers. The initiative successfully benefited **4.69 lakh farmers** out of 7.74 lakh total registered farmers.

1. Under **Kharif 2025-26, 7.89 lakh tonnes** of pulses worth **₹6,431 crore** were procured, benefiting **3.66 lakh farmers.**

2. Under **Rabi 2026-27,** procurement of pulses reached **23.51 lakh tonnes** with an MSP release of **₹14,217 crore,** benefiting **10.20 lakh farmers.**

- Pulses procurement expanded from **18,39,504.77 tonnes** in **2024-25** to **31,40,883.92 tonnes** in **2025-26.**

Mission's Key Early Progress

The Mission's early progress reflects steady momentum in building infrastructure and expanding farmer support. Key achievements so far include:

- The Mission **envisages 1,000 pulse processing units,** with **528 units already allocated** to States and Union Territories in the **first phase.**

- A total of **23 pulse processing** units have been approved for Creation and Expansion of Food Processing and Preservation Capacities (CEFPPC) under Pradhan Mantri Kisan SAMPADA Yojana (PMKSY). Out of these approved infrastructure projects, **18 pulse processing** units have been successfully completed.

- To **boost pulses in rice-fallow areas,** the Mission targets to distribute **87.5 lakh seed kits** over six years, with **9.25 lakh kits distributed** during Rabi 2025-26.

Digital Monitoring & Seed Traceability

The government leverages advanced digital platforms to ensure seamless monitoring, real-time oversight, and targeted execution across all levels:

- A **three-tier Steering Committee network** monitors planning, implementation, and progress at the national, state, and district levels.

- The **Krishi Mapper application** enables precise geo-fencing, land geo-tagging, and real-time tracking of seed variety demonstrations and yields.

- **Seed Authentication, Traceability & Holistic Inventory (SATHI)** portal provides a holistic approach to encompass the seed life cycle over

seed generations. This measure is achieved through automation of the seed supply chain, starting from seed production to certification and seed sale.

- **AgriStack & Digital Crop Survey:** Integrates unified Farmer IDs with Soil Health Card analytics and verified plot surveys to ensure targeted nutrient delivery and accurate harvest forecasts.
- Verification platforms like **E-Samriddhi and Vistaar** ensure direct payments, real-time market data, and domestic price stability.

Sowing Today, Securing Tomorrow

The early momentum indicates that the Mission for Aatmanirbharta in Pulses is successfully bridging policy intent and ground-level execution. Guaranteed price support has restored grower confidence, while digital platforms like SATHI and e-Samriddhi ensure full supply chain transparency. As India moves toward its 2030–31 production target of 350 lakh tonnes, this integrated value-chain framework promises not only long-term national protein security and foreign exchange savings, but also a replicable model for self-sufficiency across the broader agricultural economy.

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Dignity by Design: Innovation Reshapes India’s Public Toilets

Published on: 02 October 2026

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Over the years, India's cities have made significant strides in expanding access to public sanitation facilities. From improving availability and cleanliness to enhancing safety and accessibility, cities are adopting innovative approaches to make public toilets more inclusive and user-friendly.

Building on these efforts, the **Swachh Bharat Mission (SBM)**, launched on **2 October 2014**, has advanced sanitation innovation across India. Cities built toilets, raised awareness and worked towards becoming **Open Defecation Free (ODF)**. Many went further, achieving ODF+ and ODF++ status. In 2022, the Toilets 2.0 initiative under Swachh Bharat Mission-Urban (SBM-U) raised the bar again. Its aim was to make Community and Public Toilets (CT/PTs) safe, clean and inviting for everyone. Citizens can now find the nearest facility through the '**SBM Toilet Locator**' on the Swachhata app.

Today, the change is visible in unexpected places. An old bus has become a women's toilet. Plastic waste has turned into building material. A busy market now hosts a smart lounge. A small city has found a safe way to handle sanitary waste. Pilgrim towns offer facilities open to all. Together, these stories trace the journey from basic access to dignity, safety and innovation.

New Age Toilets: A Scrap Bus Becomes a Safe Space for Women

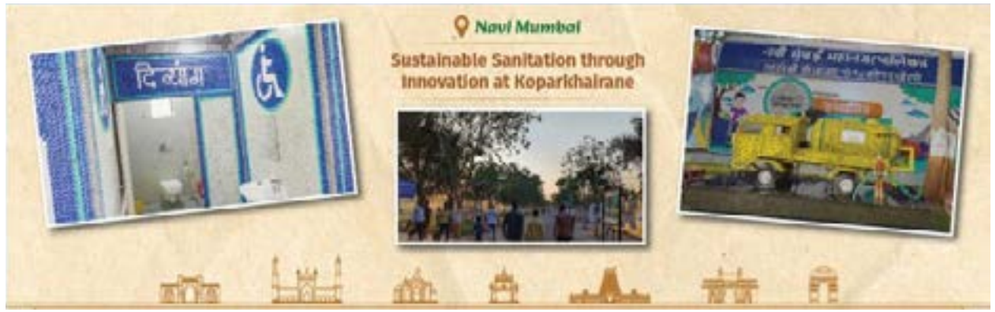
Women travelling through crowded bus terminals often struggle to find a clean and private toilet. In **Bengaluru**, **Karnataka**, an old bus found a new purpose to meet this need. The Sthree Toilet was set up at the Majestic bus terminal of the **Karnataka State Road Transport Corporation (KSRTC)**. Built from a scrap vehicle, it serves women exclusively.



The toilet has **three Indian-style and two Western-style commodes**. A **sanitary napkin vending machine** and an **incinerator** support menstrual hygiene. A dedicated space lets mothers feed their babies and change diapers. Sensor lights run on **solar power generated by the facility itself**. Waste drains into the nearest sewage chamber at the bus station. The toilet has proved especially helpful for mothers travelling with young children.

Navi Mumbai's Sustainable Toilets: A Model of Eco-Conscious Urban Design

Can a public toilet be built from what a city throws away? Navi Mumbai has shown that it can. The **Navi Mumbai Municipal Corporation (NMMC)** has developed **Aspirational Toilets** at Sector 14, Koparkhairane. The site lies near the Nisargudyan urban garden, a busy public space. Around **8,000 to 9,000 visitors** use the facility every day.



The structure uses **426 square metres of recycled plastic sheeting**. This includes **5.3 metric tonnes of single-use plastic**, 11,700 plastic bottles and 35,200 bottle caps. Builders also reused **85 repurposed computer keyboards** and **284 kg of scrap metal**. The project puts the principle of **Reduce, Reuse and Recycle** into everyday practice.

Safety and comfort are built into the design. Separate sections for men and women ensure privacy. Units for children and persons with disabilities, baby care stations and sanitary pad vending machines serve all users. A **fountain running on treated sewage water** completes its green design. The complex now stands as a symbol of environmental innovation and civic pride.

Swachh Smart Toilets: Freshrooms Bring Comfort to Bhopal

Shoppers, vendors and commuters crowd Bhopal's **10 Number Market** every day. The Bhopal Municipal Corporation has set up **'Freshrooms', smart and luxury public convenience centres**. They follow a **Design-Build-Operate-Transfer (DBOT)** model under a **Public-Private Partnership (PPP)**. The Smart



Lounge at the market covers 800 to 1,000 square feet. It serves **500 to 1,000 visitors daily**.

Technology lies at the heart of the facility. It offers **sensor-based toilets** and **touch-free urinals**. Visitors can also use hot and cold showers, lockers and Wi-Fi. A café, vending machines and baby-changing rooms add to the comfort. A **digital information wall** keeps users informed. Separate, accessible facilities serve men, women and persons with disabilities. By integrating technology, comfort and sustainability, Freshrooms demonstrate how innovative models can deliver world-class sanitation while ensuring financial self-sufficiency.

Smart Sanitary Solutions in Karad: Safe Disposal, Safer City

Clean toilets are one part of the sanitation story. Safe disposal of sanitary waste is another. Used napkins and diapers, if dumped openly, harm health and the environment. Stigma often keeps the issue hidden. **Karad**, a small city in Satara district of **Maharashtra**, has tackled this challenge head-on. It ensures **100% segregation, collection and processing** of sanitary and biomedical waste. Nearly **300 to 350 kg of sanitary waste** is collected daily from hospitals, clinics, households and other facilities.



The first step was to break the taboo around sanitary waste. Workshops, community outreach and public announcements explained the risks of careless disposal. The **Karad Municipal Council (KMC)** worked with women residents to form awareness groups. These groups carried the message across residential areas. Separate **red bins** were placed in public toilets to make safe disposal easier for women.


Female residents being trained on sanitary waste disposal

Schools were encouraged to install sanitary pad vending machines and disposal systems. The city's **Information, Education and Communication (IEC)** team urged users to wrap used pads in paper. Many schools have since installed incinerators. Their residue goes to the biomedical waste treatment plant.

Garbage collection vehicles carry a **separate bin for sanitary waste**. Staff sort this waste so that only suitable material reaches the incinerator.


Garbage Collection Vehicle with separate bin for sanitary waste



KMC has partnered with the **Karad Hospital Association** to treat this waste. KMC allocated land for construction of the biomedical waste treatment plant, while the association operates and maintains it. This is a **600 kg/day Common Biomedical Waste Treatment Facility (CBWTF)**. It processes the sanitary waste collected by the council free of charge. Its central incinerator reaches temperatures of **up to 1,200°C**. Gases are filtered to remove harmful substances. Emissions are monitored in real time and linked to the **State Pollution Control Board (SPCB)** system.



Biomedical Waste Treatment Facility, Karad

This PPP partnership has eased the council's financial burden, as it bears only collection and transport costs. High-temperature incineration of sanitary waste has reduced health risks and protects sanitation workers handling the waste. Open dumping has been eliminated, preventing environmental contamination and reducing the spread of diseases. It has improved residents' quality of life, particularly for women affected by sanitary waste disposal challenges.

Comfort, Cleanliness & Care for Tirupati's Pilgrims

Places of faith draw lakhs of visitors, making clean toilets a daily necessity. **Tirupati** is among India's busiest pilgrimage destinations. The **Tirupati Municipal Corporation** has built modern toilet complexes for devotees, tourists and residents.



A dedicated **Pink Toilet Complex** for women stands near the bus station. It links key points such as Srinivasam, Vishnuvasam, the railway station and the bus terminal. Women can use Indian and Western toilets, restrooms, and mother care and changing rooms. Incinerators and sanitary napkin vending machines support menstrual hygiene. The complex serves **12,000 to 15,000 users daily**. A structured three-shift cleaning system maintains the facility.

A Common Public Toilet Complex near the railway station caters to **20,000–25,000 devotees** visiting the Govindarajaswamy Temple area daily. Designed for universal access, it provides **dedicated facilities** for men, women, transgender persons, Divyaang, and children. Ramps, handrails, child-friendly fixtures, and bathing rooms ensure **greater comfort, hygiene, and accessibility for pilgrims**.

Road Ahead

Under SBM-U 2.0, the focus has moved beyond building toilets. The goal now is to keep them clean, safe, inclusive and sustainable. These stories show how cities are reaching that goal in their own ways. A scrap bus, recycled plastic, sensor-based fixtures and a high-temperature incinerator each play a part. Partnerships with private operators, hospitals and communities keep these facilities running well. Dedicated workers and caretakers give them life every day. As the Swachh Bharat Mission completes twelve years, the direction is clear. Every citizen, whatever their gender, ability or location, deserves a clean and dignified toilet. From markets to monuments, Indian cities are turning that promise into reality.

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Cloud Ecosystem in India

Building the Digital Foundation for Secure and Scalable Computing

Published on: 29 October 2026

Click here for Hindi

India's rapid digitalisation is driving demand for secure, scalable and reliable cloud infrastructure. Cloud computing is becoming an important foundation for digital governance and public service delivery. India is building domestic cloud capabilities through initiatives such as MeghRaj and the expansion of indigenous data centre capacity. Policy measures, institutional mechanisms, and public-private collaborations further drive cloud adoption across sectors in India.

Seeding Cloud for Data Sovereignty

India's digital transformation is generating unprecedented volumes of data across governance, commerce, communication and public services. The country's **internet subscriber base reached 1,092.79 million** in March 2026. Rising digital adoption is also driving higher data consumption, with average wireless data usage reaching 2**5.51 GB per subscriber per month.** Total wireless data usage rose to **285,376 petabytes in FY 2025–26.** Digital payments generate transaction records, online public services create digital records, and artificial intelligence applications generate and process vast amounts of information. **Managing this growing data requires secure, scalable and reliable infrastructure to store, process and manage information efficiently.**

Meeting these requirements demands more than storage space. Organisations also need computing power to process information, run applications and deliver digital services reliably. Maintaining physical servers and other equipment independently can be expensive and difficult to expand. **Cloud computing addresses this challenge by providing computing resources over the internet, whenever required.** However, as dependence on cloud services grows, protecting sensitive information and maintaining control over its storage and processing become increasingly important. **Developing a domestic cloud can support data sovereignty by strengthening national control over critical digital resources.**

Cloud computing enables users to access computing resources, including data storage, servers, software and processing capabilities, over the internet. Instead of purchasing and maintaining their own servers, organisations can use these resources as needed. For example, Google Drive allows users to store documents online and access them across multiple devices. Similarly, a government department can host its applications and databases on a cloud platform instead of maintaining all the necessary equipment itself. When backed by appropriate security safeguards and governance frameworks, domestic cloud infrastructure can strengthen control over sensitive information. It can also support reliable public services, artificial intelligence development and India's technological self-reliance.

A **server room** is a dedicated space housing computers that store data and run digital services. For example, a school can store student records on a cloud platform instead of investing in its own computing infrastructure.

It enables **faster deployment of digital services and applications** by letting organisations launch services without lengthy infrastructure setup. For instance, a hospital can introduce an online appointment system without setting up its own servers.

India's Cloud Service Provider Ecosystem

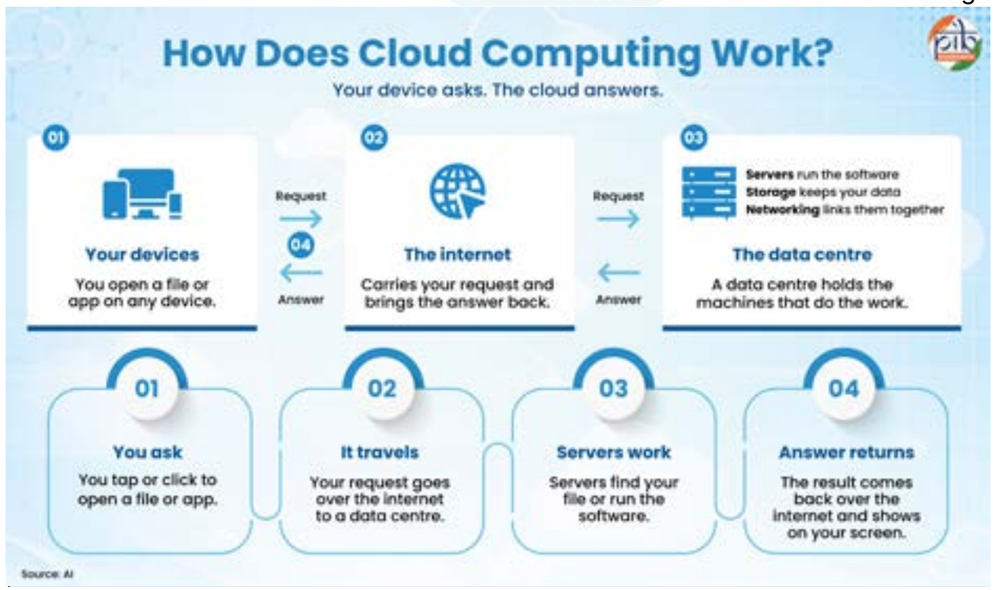
As of September 2026, India has empanelled 30 Cloud Service Providers (CSPs), with infrastructure across locations including but not limited to Mumbai, Navi Mumbai, Chennai, Hyderabad, Bengaluru, Delhi-NCR and Jamnagar. The empanelled providers include Indian companies such as Jio Platforms Limited, Tata Consultancy Services Limited, Bharat Sanchar Nigam Limited (BSNL), ITI Limited, RailTel Corporation of India Limited, AdaniConneX Private Limited and Yotta Data Services Private Limited. International providers include Google Cloud India Private Limited, Oracle India Private Limited, Microsoft Corporation India Private Limited and Amazon Web Services India Private Limited, among others.

Key Benefits of Cloud Computing

Cloud computing offers several benefits by making digital infrastructure more accessible, flexible and efficient. It **reduces costs** by limiting the need to purchase and maintain physical servers.

Cloud platforms also provide **easy scalability,** allowing organisations to adjust computing resources according to demand. For example, an online examination portal can increase its resources during registration periods and reduce them afterwards.

Cloud computing promotes **better collaboration** by allowing users in different locations to access and share information. For instance, university students can collaborate on research projects, share study materials and edit documents online.



Cloud platforms reinforce **data backup and recovery,** helping users retrieve information after accidental deletion, equipment failure or other disruptions. For example, a hospital can restore backed-up patient records following a system failure.

These capabilities also strengthen **service continuity** by helping organisations resume operations quickly after unexpected interruptions. For example, an online banking service can switch to backup systems when its primary infrastructure encounters technical problems.

Cloud computing further supports **efficient data management** by simplifying the storage, organisation and retrieval of digital records. For instance, an e-commerce business can manage product information, customer orders and inventory records through a single cloud-based system.





Migration of Digital India BHASHINI Platform to the Cloud

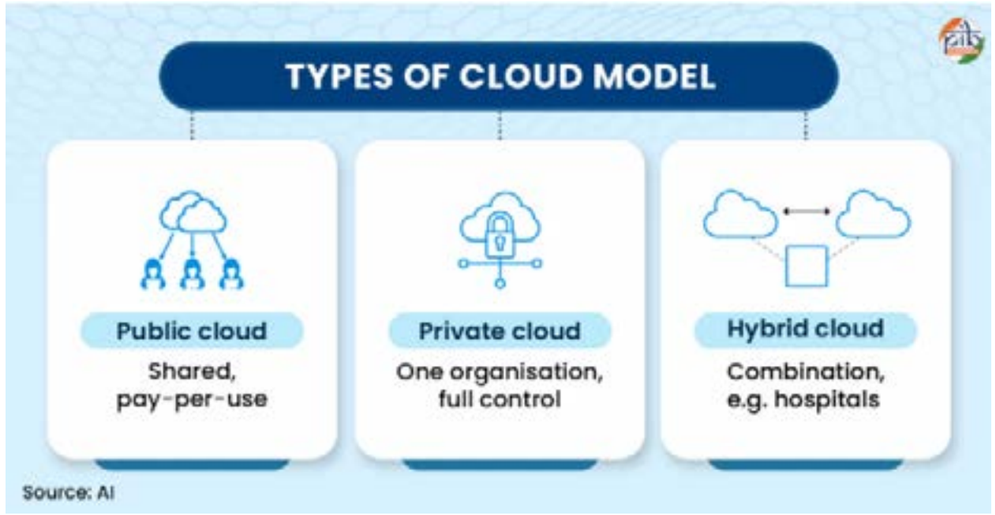
The Digital India BHASHINI platform demonstrates how indigenous cloud infrastructure can support data sovereignty while improving digital services. In February 2026, the Ministry of Electronics and Information Technology reported BHASHINI's migration to an Indian cloud operated by Yotta Data Services. This transition keeps its language datasets, AI models and citizen interactions within India's jurisdiction. The deployment reportedly **achieved up to 40% improved performance, 20–30% cost savings and 99.99% uptime.**

During Maha Kumbh 2025, BHASHINI supported real-time translation and voice-based assistance in more than 11 Indian languages. Its multilingual services helped pilgrims access information despite language barriers.

Understanding the Fundamentals of Cloud Computing

Types of Cloud Models

Cloud models determine **where cloud infrastructure operates, who can use it, and how much control an organisation retains.** The three commonly discussed models are public, private and hybrid cloud.



A **public cloud** uses infrastructure provided by a third-party provider and shared among multiple customers. For example, a business/video-streaming company serves millions of viewers from shared servers.

A **private cloud** dedicates infrastructure to a single organisation. For example, a state treasury office keeps payment and accounts data on a private cloud to manage sensitive administrative records with greater control over security.

A **hybrid cloud** combines public and private cloud environments. For example, a municipal corporation keeps its property-tax payment portal on a public cloud and citizens' records on a private one. The choice depends on an organisation's security, cost and operational requirements.

Various Cloud Services

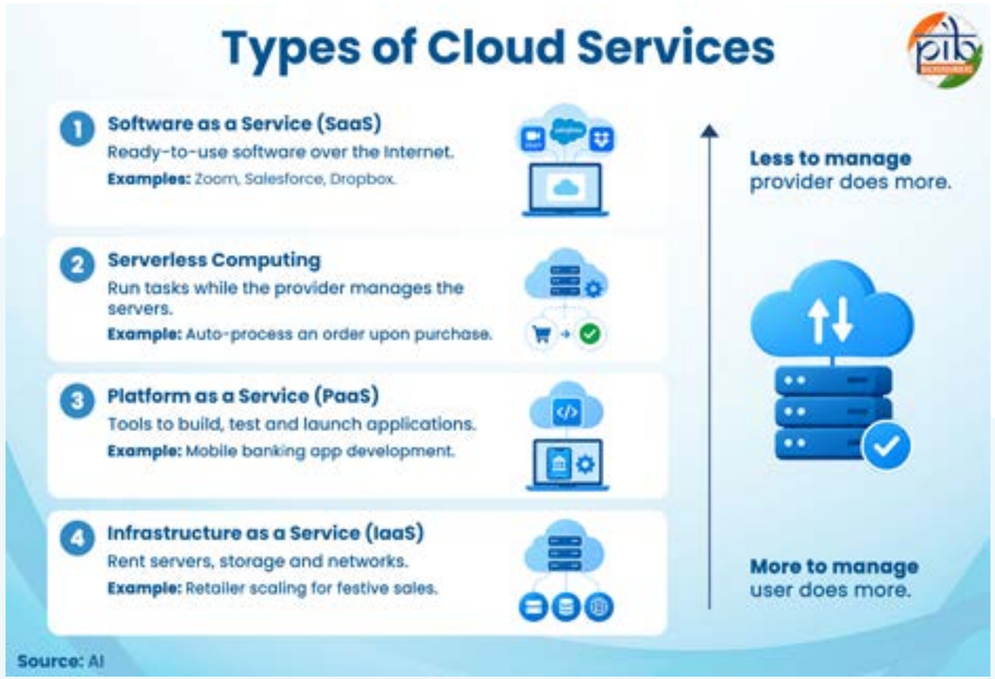
Cloud services offer different levels of computing support, from renting digital infrastructure to using ready-made applications. Four common categories are **Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)** and **serverless computing.** These are also sometimes called the cloud computing "stack" because they build on top of one another.

Infrastructure as a Service (IaaS) allows users to rent computing resources such as virtual servers, storage and networks instead of buying physical equipment. For instance, an online retailer can lease cloud servers to host its website and scale computing capacity to accommodate surges in traffic during festive sales.

Platform as a Service (PaaS) enables developers with tools to build, test and launch applications without managing the underlying infrastructure. For example, a team developing a mobile banking application can use a cloud platform to build and test its software.

Software as a Service (SaaS) delivers ready-to-use software over the internet, with the provider managing updates and maintenance. Examples include **Zoom** for video conferencing, Salesforce for customer relationship management and **Dropbox** for online file storage

Serverless computing allows developers to run specific tasks without managing servers directly. The cloud provider manages the infrastructure and allocates resources when required. For example, an online shopping platform can automatically process an order when a



customer completes a purchase. Despite its name, serverless computing still uses servers; the provider manages them on the developer's behalf.

India's Progress in the Deployment of Indigenous Cloud Ecosystem

India is reinforcing its domestic cloud ecosystem to aid digital governance, data management and emerging technologies. The Government is branching out shared infrastructure, implementing trusted cloud services and driving indigenous computing capabilities.

MeghRaj and MeghRaj 2.0: Government of India's Cloud Ecosystem

MeghRaj, the Government of India's Cloud Ecosystem, was launched in 2014 by the MeitY to accelerate e-governance and optimize public ICT spending. **MeghRaj 2.0** represents the second-generation iteration of this National Cloud Computing Initiative, serving as the secure digital backbone for the country's Digital India mission. By providing flexible IaaS, PaaS, and SaaS models through a distributed cloud architecture, it allows government departments to rapidly deploy digital applications on demand.

The ecosystem has scaled tremendously in the last decade. By September 2026, adoption grew to encompass 2,330 government departments. Today, MeghRaj 2.0 provides the highly secure, AI-ready hosting required to power India's digital platforms, including DigiLocker, MyGov, and the National Scholarship Portal, alongside the Department of Posts' Advanced Postal Technology (APT). Click to Read More About: India Digital Public Infrastructure

Data Centres as a Pillar of India's Cloud System

Data centres house the servers and storage systems that power cloud computing. India's data centre sector is gaining momentum, driven by growing demand for digital services and AI computing. As of August 2026, India's data centre capacity reached **1.57 GW** and is projected to grow to nearly **8 GW** by 2030. The sector is concentrated in Mumbai, Navi Mumbai, Chennai, Hyderabad, Bengaluru, Delhi-NCR and Jamnagar. Emerging data centre hubs are also gaining traction in Andhra Pradesh, Madhya Pradesh, Chhattisgarh and West Bengal. Meeting this growing demand requires substantial capital, and the sector is attracting around USD 70 billion in investments underway, alongside a further USD 90 billion in announced projects. These investments are expected to augment computing capacity and broaden India's domestic cloud capabilities. Click to Read More About: Data Centres In India

Strengthening the Data Centre Network

The National Informatics Centre (NIC) forms an integral part of India's data centre infra, operating 4 National Data Centres and 24 Mini Data Centres across the country. These facilities provide shared hosting, co-location and cloud services to government departments. Mini data centres at NIC State Centres further cater to state-level e-governance requirements through decentralised yet standardised infrastructure.

IndiaAI Mission — Democratizing Access to AI Computing

Cloud infrastructure equips researchers and start-ups with the computing resources needed to deploy AI applications. The **IndiaAI Mission,** approved with an outlay of **₹10,371.92** crore, is broadening access to computing resources. More than **45,000 Graphics Processing Units (GPUs)** have been onboarded for a common AI computing facility. These resources provide Indian start-ups and academic institutions with affordable computing power for AI development, reducing the need for investment in dedicated equipment. Click To Read More About: Transforming India with AI

Upskilling and Capacity Building Initiatives in Cloud Computing

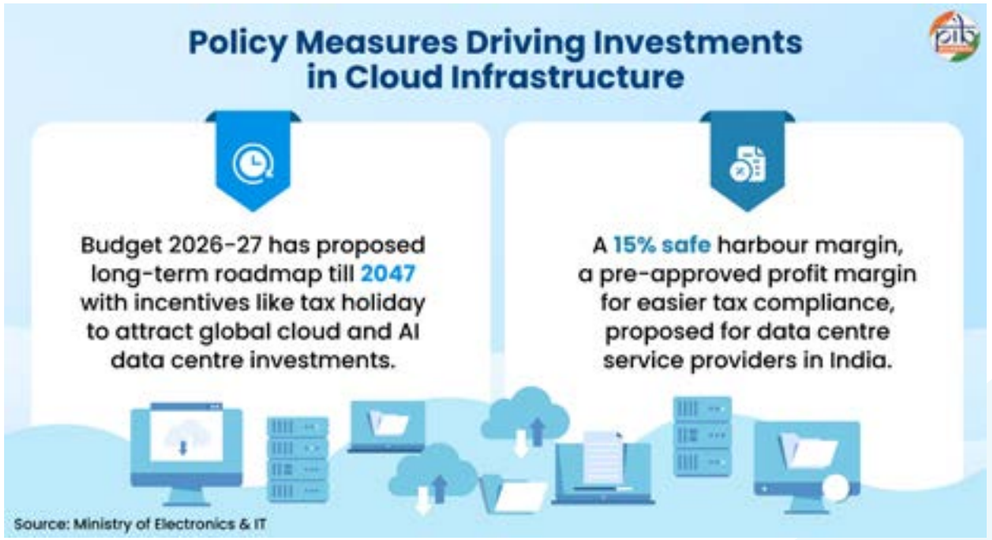
Building a skilled workforce is essential to operating India's expanding digital infrastructure. The FutureSkills PRIME Programme, launched in 2021 by MeitY–NASSCOM, promotes emerging-technology skills. By August 2026, it had 34 lakh registered candidates, with over 23 lakh enrolled or trained. It ranked 3rd globally in the European Commission's Pact for Skills Report 2024 for industry-focused training in AI, cloud computing and data analytics. Complementing this initiative, the **National Institute of Electronics**

and Information Technology (NIELIT) operates 56 centres, 750 affiliated institutes and over 9,000 facilitation centres, training professionals in cloud computing, AI, cybersecurity, blockchain and IoT.

Further reflecting this talent base, a 2026 report by the Cloud Native Computing Foundation (CNCF) estimates that India has 2.25 million cloud-native developers. The report also finds that 44% of Indian developers use hybrid cloud, combining public and private cloud environments. This skilled workforce can facilitate the management of India's evolving cloud ecosystem.

Policy Push Driving Cloud Adoption in India

India's cloud strategy centres on building a globally competitive digital infrastructure through coordinated policy initiatives and targeted investments. Recognising cloud and data centres as critical to emerging technologies and data-driven services, the Union Budget 2026–27 highlighted their role in advancing India's digital capabilities. The measures aim to attract investment in cloud computing, AI, and hyperscale data centres while enhancing India's long-term digital capacity.



Did You Know? In March 2026, MeitY issued a Cloud Selection Framework which provides structured guidance to Ministries and Departments for selecting cloud infrastructure based on data sensitivity and criticality. It introduces a data classification approach aligned with national security considerations, prioritises the use of government-backed cloud such as NIC and State Data Centres, and enables adoption of hybrid deployment models with empanelled cloud service providers.

Additionally, the Digital Personal Data Protection (DPDP) Act, 2023 establishes safeguards for personal data processing and sets conditions for cross-border data transfers. It encourages the use of local data centres and cloud services, as reflected in provisions related to data residency and restrictions on cross-border data transfer. It also ensures better control over data and compliance with regulations through provisions on explicit user consent, accountability of data fiduciaries, and strict data processing obligations.

Guiding Secure and Standardised Digital Governance

The National e-Governance Division (NeGD) offers technical and advisory aid for e-governance projects at central and state levels. Its responsibilities include technical appraisal of projects, including their technology architecture, security, standards and use of common infrastructure. This collaborative framework is taking forward cloud services throughout India's government ecosystem, fuelling Digital India and e-Governance priorities.



The Path Forward for India's Cloud Ecosystem

India's cloud ecosystem is witnessing rapid expansion, with the country's cloud data capacity projected to grow nearly 4–5 times by 2030. Rising reliance on cloud infrastructure across digital governance, public service delivery, and technology-driven platforms is driving demand for computing resources. Investments in data centres are augmenting domestic capacity, while targeted skill-development initiatives are cultivating a workforce equipped for cloud-based technologies. Together, these measures are fostering innovation and positioning cloud computing as a cornerstone of India's long-term digital transformation.

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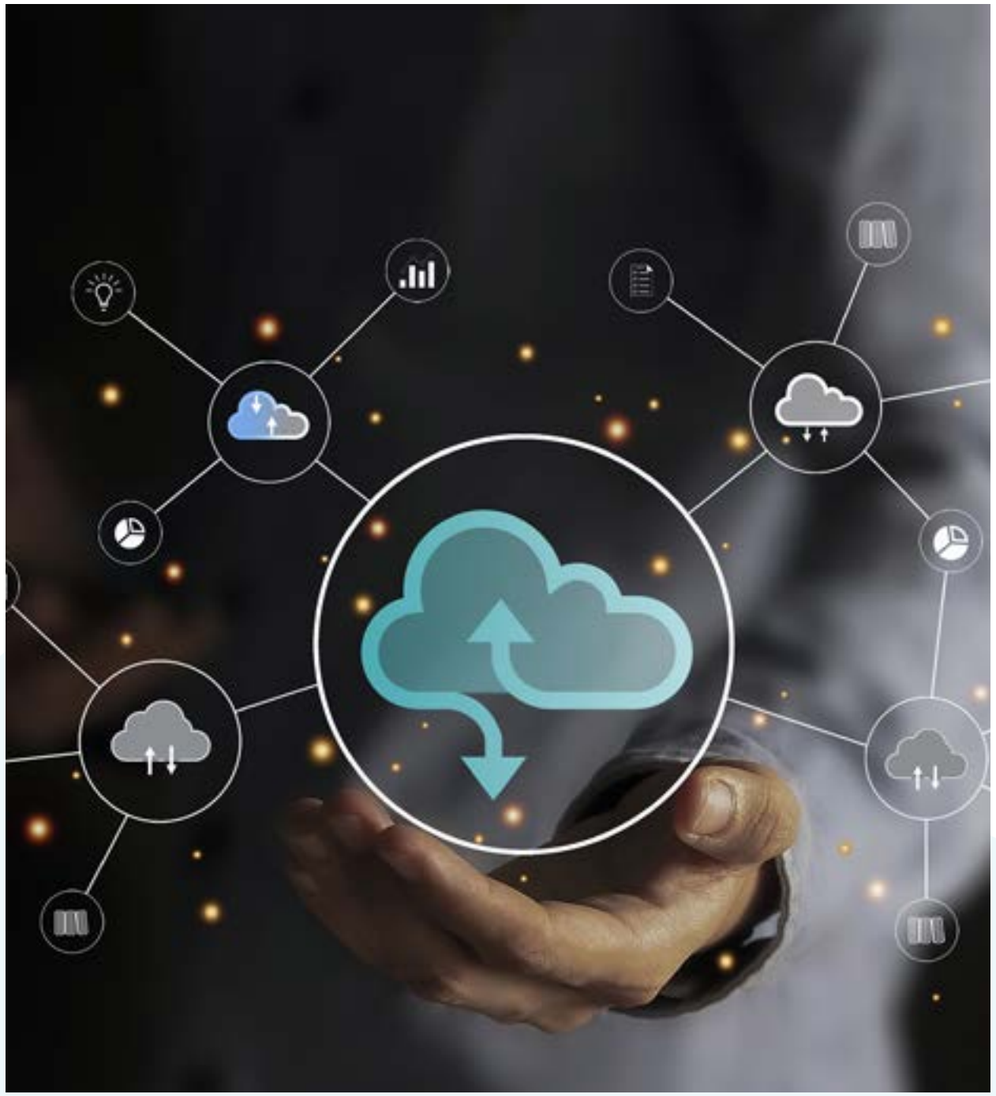
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Finding New Purpose in What We Discard

Rethinking Waste from Kitchen Scraps to City Spaces

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Click here for Hindi

Swachh Bharat Mission (SBM), launched in 2014, has evolved into a broader movement for cleanliness, waste management, and behavioural change. The mission also created space for wider citizen participation through Swachhata Hi Seva (SHS), launched in 2017 as an annual campaign for collective cleanliness action. The campaign has expanded its focus to plastic waste management, visual cleanliness, and garbage-free public spaces.

Parallelly, the idea of **Waste to Wealth** is changing how waste is viewed and managed across India. It treats discarded material as a resource that can be **recovered, reused, and converted** into value. The Government has linked this approach with circularity, resource efficiency, and sustainable waste management. Under Swachh Bharat Mission - Urban 2.0, cities are encouraged to strengthen source segregation, waste processing, and recovery of value from waste. The change is visible not only in large processing plants, but also in homes, communities, and local institutions.

A Compost Bin Brings the Change Home

For many Indian households, turning kitchen waste into compost is not a new idea. It is a practice that is finding a fresh place in today's waste management systems. In Vijayawada, Andhra Pradesh, senior citizen **K. Subbalakshmi**



has shown how this familiar habit can be adopted at home. The municipal corporation recently shared her experience to encourage more citizens to take up home composting. The wet waste generated in her kitchen is converted into compost and used in her garden, returning what would otherwise be discarded to the soil.

A similar effort began in Chandigarh during the COVID-19 pandemic. Resident **Kamaljeet Kaur Deol** started composting wet kitchen waste at home. What began as a household practice gradually grew



into awareness activities to encourage others to adopt home composting. Her efforts have since helped inspire citizens to contribute towards a **cleaner and greener city.**



As these individual efforts began encouraging wider participation, the idea also found a place in organised community learning. In Siddipet, Telangana, the dedicated waste management learning centre **'Swachh Badi'** is providing young people with hands-on exposure to practical waste management practices, from home composting to community-level composting. Building on this approach, similar centres are planned across **141 municipal areas,** bringing awareness and practical learning on responsible waste management closer to communities.

What begins with a small compost bin can therefore have a wider effect. It gives new life to plants while keeping a regular stream of wet waste away from landfills. More importantly, it shows how waste management can begin where waste itself is generated.

When a Weed Becomes an Opportunity

Beyond household waste, communities are also finding uses for materials that have long been difficult to manage. In Borchila village of Assam's Morigaon district, this approach is being applied to a plant that has become a persistent challenge for communities living around water bodies. Water hyacinth, locally known as **'pani meteka'**, is an invasive aquatic plant that spreads rapidly across water bodies. Despite its aesthetic appeal, water hyacinth has become a problematic weed, overcrowding freshwater bodies such as rivers, ponds, and lakes. Its overgrowth hampers activities like fishing, transportation, and recreation, making these water sources less viable.

However, the women of Borchila village have found a new way to turn water hyacinth into an opportunity. Instead of viewing the plant only as an unwanted growth in water bodies, they have begun transforming it into handicrafts.

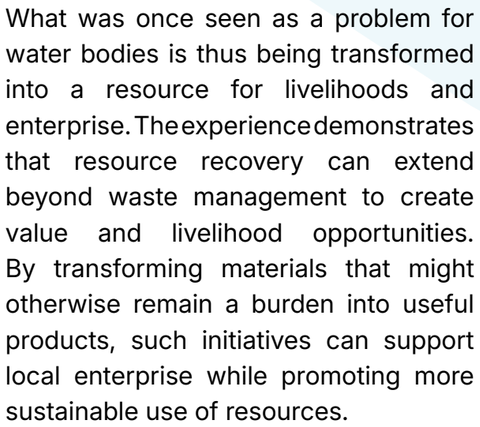


SHG women from Borchila weaving products out of water hyacinth

Supported under the Assam State Rural Livelihoods Mission, the initiative has created an additional source of income for the participating women, who earn at least **₹10,000** a month through this work. What was once seen as a problem for water bodies is thus being transformed into a resource for livelihoods and enterprise. The experience demonstrates that resource recovery can extend beyond waste management to create value and livelihood opportunities. By transforming materials that might otherwise remain a burden into useful products, such initiatives can support local enterprise while promoting more sustainable use of resources.

Coconut Waste Finds a New Market

From an invasive plant being transformed into a source of rural livelihood, the focus now shifts to another material contributing to the urban waste burden. In Patna, coconut shells, fibres and other residues are being recovered and processed into







Coconut Waste Processing Plant in Patna

useful products. The city generates around **25–30 metric tonnes of coconut shell every day,** which previously added to the volume of waste reaching landfill sites. To address this waste stream, the Patna Municipal Corporation has established a processing facility in the Danapur area, creating a pathway for converting discarded coconut residues into productive resources.







Ropes made from coconut waste fibers

The initiative reflects the systematic approach to waste management promoted under the **Swachh Bharat Mission,** where waste is increasingly viewed as a resource rather than merely a material for disposal. The facility is designed to recover useful components from coconut waste and convert them into products with applications in agriculture, horticulture, and other commercial uses. With an initial processing capacity of **10 tonnes per day,** the plant is planned to operate in multiple shifts and scale up to **30 tonnes per day.**

Different components of coconut waste can be recovered and put to productive use. Wet residues are processed into high-quality organic compost, while coconut fibres are converted into coir ropes with applications in construction, packaging, mats, and handicrafts. Cocopeat is another valuable output, with applications in agriculture and horticulture, including nurseries and rooftop gardens, where its use as a growing medium is gaining importance. By recovering and processing these materials, the initiative reduces the volume of coconut waste requiring disposal and enables waste-derived products to re-enter productive use. This approach advances circular economy practices while creating avenues for local livelihoods and employment.

When Waste Becomes a Public Space

The idea of Waste to Wealth is also

changing how cities look at discarded material. Instead of treating scrap only as waste, cities are finding ways to reuse it in public spaces and community facilities. One such approach is the creation of Waste to Wonder parks, where discarded material is given a new purpose as part of public spaces and attractions. The approach reflects the principles of a circular economy, which encourage materials to be reduced, reused, repaired, and recycled for continued use.



Chandigarh offers an early example of this approach. Its Rock Garden was created using industrial and household waste, demonstrating how discarded material can be creatively reused in a public space. The city has also developed a Waste to Wonder Park spread across 1.75 acres. Structures in the park have been created from discarded materials such as iron sheets, rods, fans, and automobile parts.

Delhi has adopted a similar approach through its **Waste to Wonder Park,** where industrial waste, scrap metal, and discarded automobile parts sourced from landfills are repurposed to create replicas and other structures. Beyond recreation and urban beautification, such spaces demonstrate how discarded materials can be integrated into productive and public-use infrastructure. Beyond urban beautification, the park integrates clean energy infrastructure, featuring solar trees and rooftop solar panels with a combined capacity of 50 KW. The electricity generated can be supplied to power distribution companies, creating an additional avenue for revenue generation while promoting the productive use of waste and renewable energy.

From Waste to Resource

These examples demonstrate how discarded materials can be **recovered, repurposed, and returned to productive use** rather than being sent directly for final disposal. Materials that would otherwise add to the waste burden can be transformed into components of public spaces, creative attractions and, in some cases, sources of economic value.

The **Waste to Wealth** approach begins with a shift in perspective, from viewing waste as something to be discarded to recognising its potential as a resource. Through proper segregation, recovery



and processing, discarded materials can be converted into useful products, supporting cleaner communities, resource efficiency and the transition towards a circular economy.



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PIB Research



Saving Time, Shortening Journeys

How India’s Infrastructure Is Bringing Places Closer

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Connectivity Measured in Hours Saved

For millions of travellers, better connectivity is measured in hours saved, not only in kilometres built. Across India, new bridges, tunnels, expressways and rail services are changing the time it takes to travel between cities, regions and communities. By replacing detours, difficult terrain and slow routes with direct and faster connections, these projects are making infrastructure-led transformation visible in everyday travel. As faster links reach more parts of the country, distance is becoming less of a constraint on everyday mobility.

Bridges: Crossing Barriers, Cutting Travel Time

Bridges are removing long and slow river crossings from everyday travel and turning journeys that once took hours into much shorter trips.

- **Bhupen Hazarika Setu/ Dhola–Sadiya Bridge, Assam–Arunachal Pradesh (May, 2017)**
  6 hours → 1 hour

  Travel time between Rupai in Assam and Meka/Roing in Arunachal Pradesh has fallen from six hours to one hour, saving **five hours.**



Bhupen Hazarika Setu, Assam- Arunachal Pradesh

- **Bogibeel Bridge, Assam (December, 2018)**
  A day-long journey → 1–2 hours

  The rail-cum-road bridge over the Brahmaputra has transformed connectivity between Dhemaji and Dibrugarh. Journeys that earlier took almost an entire day now take about one to two hours.

- **Atal Setu, Maharashtra (January, 2024)**
  2 hours → 20 minutes

  The Mumbai Trans Harbour Link provides a direct connection between Mumbai and Navi Mumbai, cutting the journey to about 20 minutes.

- **Kosi Rail Mahasetu, Bihar (September, 2020)**
  8 hours → 30 minutes

  The Kosi Rail Mahasetu reduced the rail journey between Nirmali and Saraigarh from about eight hours to 30 minutes, while reducing the distance from about 300 km to 22 km.

- **Sisseri River Bridge, Arunachal Pradesh (November, 2019)**
  About 5 hours saved

  The 200-metre Sisseri River Bridge reduced the travel time between **Pasighat and Roing by about five hours**, strengthening connectivity between Dibang Valley and Siang.

Tunnels: Cutting Through Terrain, Saving Hours

Tunnels are taking the shortest route through some of India's most difficult terrain. Bypassing mountains, winding roads and vulnerable stretches, they are bringing down travel times while making journeys seamless.



Atal Tunnel, Himachal Pradesh

- **Atal Tunnel, Himachal Pradesh (October, 2020)**
  4–5 hours saved

  The 9.02-km tunnel bypasses Rohtang Pass and reduces the Manali–Sarchu distance by **46 km**, providing all-weather connectivity to Lahaul-Spiti.

- **Dr. Syama Prasad Mookerjee Tunnel, Jammu & Kashmir (April, 2017)**
  Nearly 2 hours saved

  The 9-km tunnel bypasses difficult terrain, cuts the travel distance by about **30 km** and reduces travel time between Jammu and Srinagar by nearly two hours.

- **Banihal–Qazigund Road Tunnel, Jammu & Kashmir (April, 2022)**
  ~1.5 hours saved

  The 8.45-km twin-tube tunnel cuts the road distance by **16 km** and reduces journey time by around one and a half hours.

- **Sela Tunnel, Arunachal Pradesh (March, 2024)**
  Travel time cut by over 1 hour

  Built at an altitude of about 13,000 feet, the tunnel ensures all-weather connectivity on the strategically important Tezpur-Tawang route.

Expressways & Economic Corridors

Expressways are changing the pace of inter-city travel through shorter alignments, controlled access and higher speeds. Long journeys that once consumed several hours are being compressed into significantly faster

road trips.

- **Delhi–Meerut Expressway (2021)**
  2.5 hours → 50 minutes

  The 82-km project reduced travel time between Delhi and Meerut from around two and a half hours to about 50 minutes.

- **Bengaluru–Mysuru Expressway (March, 2023)**
  3 hours → 75 minutes

  The 118-km expressway has reduced travel time between Bengaluru and Mysuru from nearly three hours to about 75 minutes.

- **Delhi–Dehradun Economic Corridor (April, 2026)**
  6 hours → 2.5 hours

  The 213-km access-controlled corridor reduces travel time between Delhi and Dehradun from over six hours to around two and a half hours.

- **Mumbai–Nagpur Samruddhi Mahamarg (December, 2022)**
  16 hours → ~8 hours

  The 701-km access-controlled expressway has substantially reduced travel time between Mumbai and Nagpur.

- **Ahmedabad–Dholera Expressway (March, 2026)**

  Ahmedabad- Dholera: from 100 km & 2 hr 15 min → 83 km & 45 min
  Ahmedabad to Bhavnagar: from 169 km & 3 hr 15 min → 141 km & 1 hr 45 min

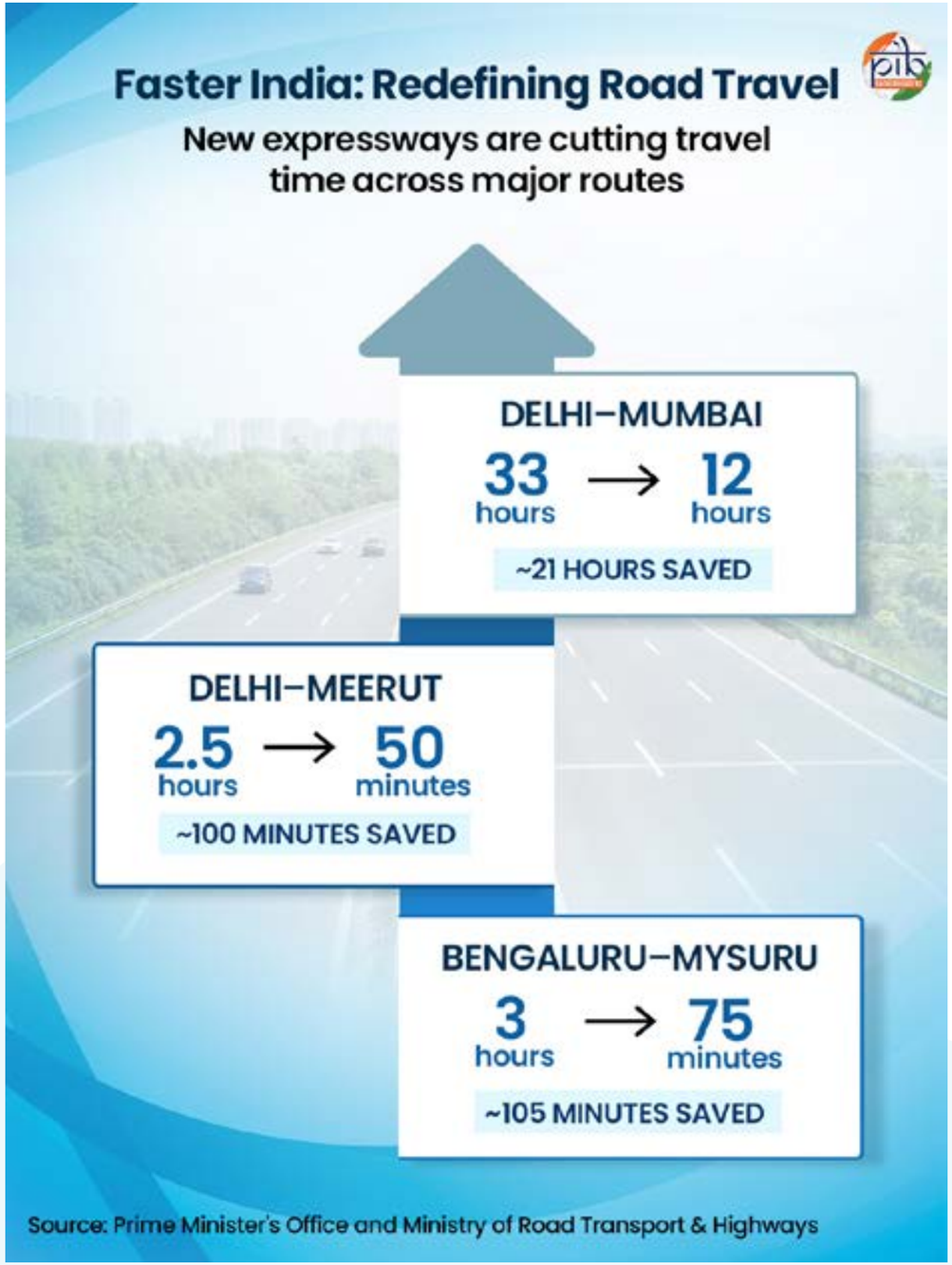
  The access-controlled greenfield expressway stretching over 109 km provides a high-speed link between Ahmedabad and Dholera.

- **Delhi–Amritsar–Katra Expressway (Phase-I- July, 2026)**
  Delhi–Amritsar: 8 hours → 4 hours
  Delhi–Katra: 14 hours → 6 hours

  The expressway is being developed to boost pilgrim and tourist traffic to Shri Mata Vaishno Devi, and catalyse industrial and logistics development along the corridor.

- **Delhi–Mumbai Expressway**
  33 hours → ~12 hours

  The greenfield expressway is being developed to reduce travel time between Delhi and Mumbai to about 12 hours from roughly 33 hours.



Railways: Faster Trains, Shorter Journeys

New-generation trains and dedicated high-speed corridors are bringing major time savings to rail travel. The 2026 railway timetable reflects this shift, with 549 trains speeded up across the network. Of these, 20 trains became faster by 60 minutes or more. Another 48 trains gained 31–59 minutes, while 105 trains gained 16–30 minutes. The remaining 376 trains were speeded up by 5–15 minutes.

New Generation Trains

- **Vande Bharat Express, New Delhi–Varanasi (February, 2019)**
  40–50% faster than earlier services

  India's first Vande Bharat was launched on 15 February 2019 on the New Delhi–Kanpur–Prayagraj–Varanasi corridor. The scheduled travel time between New Delhi and Varanasi is approximately eight hours, making it around 40-50% faster than earlier services on the route.

- **Vande Bharat Express, Katra–Srinagar (June, 2025)**
  2–3 hours saved

  The train cut Katra–Srinagar travel to about three hours. The extended Jammu–Srinagar service now covers the journey in 4 hours 50 minutes.

- **Vande Bharat Express, Banaras–Khajuraho (November, 2025)**
  ~2 hours 40 minutes saved

  The train saves about 2 hours 40 minutes compared with the special trains earlier in operation.

- **Vande Bharat Express, Ernakulam–Bengaluru (November, 2025)**
  Over 2 hours saved
  The service covers the journey in 8 hours 40 minutes, reducing travel time by over two hours.

- **Vande Bharat Express, Lucknow–Saharanpur (November, 2025)**
  Nearly 1 hour saved

  The train completes the journey in approximately 7 hours 45 minutes.

- **Vande Bharat Sleeper, Howrah–Guwahati (January, 2026)**
  ~17 hours → ~14 hours

  India's first Vande Bharat Sleeper saves nearly three hours over the Saraighat Express. It has 16 air-conditioned coaches for around 823 passengers.



Vande Bharat Train

High-Speed Rail Corridors

- **Mumbai–Ahmedabad High-Speed Rail Corridor**
  8–9 hours by road → ~1 hour 58 minutes

  The **508-km** corridor, with an operational speed of **320 kmph**, will serve 12 stations. It includes India's first undersea rail tunnel, about 7 km beneath Thane Creek. The first service is targeted for August 2027.

- **Seven Announced High-Speed Rail (HSR) Corridors**
  Major city pairs within about 1–4 hours

  Announced in the Union Budget 2026–27, the corridors span nearly **4,000 km** with an estimated investment of **₹16 lakh crore**.

Corridor	Indicative travel time
Delhi–Varanasi	~3 hours 50 minutes
Varanasi–Patna–Siliguri	~2 hours 55 minutes
Chennai–Bengaluru	~1 hour 13 minutes
Bengaluru–Hyderabad	~2 hours

Chennai–Hyderabad	~2 hours 55 minutes
Mumbai–Pune	~48 minutes
Pune–Hyderabad	~1 hour 55 minutes

Hours Returned to Travellers and Communities

The transformation of India's transport network is changing how people and regions connect with one another. Bridges and tunnels are opening new crossings while expressways and modern rail services are redefining long-distance travel. Together, these interventions are making mobility more seamless and expanding access across regions.

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PIB Research





From First Drop to Clean Streets

Cities Prepare for a Cleaner, Healthier Monsoon

Published on: 01 October 2026

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Before the Rains, the Cities Move

As the monsoon approaches and the first rains arrive, cities across India begin preparations to address the seasonal risks associated with waterlogging, waste accumulation, and sanitation. Drains are cleaned, vulnerable locations are identified, and measures are undertaken to maintain cleanliness and public health. Under the Ministry of Housing and Urban Affairs-led **Safai Apnao, Bimaari Bhagao 2025 (SABB) campaign,** urban local bodies translated pre-monsoon preparedness into a coordinated cleanliness and public health effort. From **1 July to 31 July 2025,** cities undertook drain cleaning, waste removal and hygiene promotion, while engaging communities through schools, neighbourhoods and other public spaces.

At the heart of the campaign are the **'6 Swachhata Mantras':** clean hands, homes, neighbourhoods, toilets, drains and public spaces. Together, these simple practices are becoming part of a larger city-wide effort to keep the monsoon safer and healthier. And across the country, that effort is taking many different forms.

In **Delhi,** the campaign took the message to its streets and schools. 400 NCC girl cadets led a 3-km Pinkathon, a walkathon promoting monsoon hygiene and sanitation. The campaign saw significant on-the-ground action, including handwashing drives in **255 schools,** while **206 cleaning drives** covered backlanes and garbage vulnerable points (GVPs). Another **469 sanitation drives** were conducted in community and public toilets (CTs and PTs). The Patna Municipal Corporation (PMC) introduced **'Manhole Ambulances'** to enhance urban safety and sanitation through swift, on-site manhole repairs. Each ambulance carries prefabricated manhole covers, repair tools, and a dedicated response team for immediate action, especially during rains. PMC repurposed old, unused municipal vehicles into functional units. Six ambulances, one per municipal zone, are operational and linked to PMC's central control room for real-time complaint resolution. The initiative enables citizen-centric grievance redressal and ensures faster responses to manhole-related complaints.



In **Navi Mumbai,** a Swachhata rally was organised with the participation of over **600 students, parents, teachers, and citizens. Simultaneously, health awareness camps were held across 26 Urban Primary Health Centres, focusing on malaria and dengue prevention.** Over two days, 52 health camps were conducted, reaching more than 22,690 citizens. In **Telangana,** the campaign reached nearly **13 lakh households.** Around **14,210 km of drains** were desilted, while **4,343 km of roadside bushes** were cleared. Nearly **2.5 lakh houses** were covered through anti-dengue and malaria awareness drives. Health camps also benefited over 8,500 frontline workers. Meanwhile, **140 composting pits** were set up in schools, encouraging young citizens to turn waste into manure.

In **Chhattisgarh,** the story begins with people themselves. In **Pandariya,** Self-Help Group members received sanitation training and were introduced to the **Swachhata App.** They then took part in a cleanliness drive. In Raipur, door-to-door outreach promoted hand hygiene and waste segregation, while Garbage Vulnerable Points (GVPs) were cleaned and beautified.

Northeast Unites for a Cleaner, Safer Monsoon

As the monsoon approaches, the Northeast is getting ready not by waiting for the rains, but by preparing for them. Across **Arunachal Pradesh, Nagaland, Assam, Sikkim and Tripura, the MoHUA-led SABB campaign** is strengthening monsoon preparedness through collective cleanliness and disease prevention.

In **Nagaland,** Urban local bodies (ULBs) across six towns led school awareness activities, drain cleaning, health camps and cleanup drives. These efforts engaged nearly **5,000 people** through **60 cleanliness, 30 rainwater harvesting and 40 post-monsoon awareness drives.** Across the hills of **Sikkim,** the campaign took aim at garbage-prone areas and the risks of water- and vector-borne diseases. Students, officials and Self-Help Groups (SHGs) came together around source segregation and better waste management. Around **4,000 people** participated in **100 cleanliness and**



100 post-monsoon drives, alongside awareness rallies and PET bottle shredding initiatives. In Assam, towns focused on drain cleaning, garbage removal, SafaiMitra health check-ups and waste segregation. Around **5,500 people** joined **200 cleanliness and 40 rainwater harvesting activities,** supported by **160 organisations and NGOs.**

In **Tripura,** ULBs strengthened waste collection, segregation and public toilet maintenance. Around **5,000 people** participated in **150 cleanliness and 30 rainwater harvesting drives,** alongside health camps, school rallies and sanitation initiatives. Across **47 urban notified towns in Arunachal Pradesh,** efforts covered waste management, water quality and public toilet maintenance. Water treatment plants were inspected, while mass cleanliness drives targeted garbage-vulnerable points. These efforts demonstrate how cleanliness and disease prevention can be integrated into **everyday community action.**

From Backlanes to Clean, Vibrant Neighbourhood Spaces

A **backlane** refers to the space behind houses in a neighbourhood, generally characterised by limited pedestrian movement. Such areas can become vulnerable to waste accumulation and informal dumping. Recognising this, cities across Madhya Pradesh organised **backlane cleaning drives with active public participation.** The initiatives included the removal of encroachments and cleaning of drains to facilitate the smooth flow of rainwater during the monsoon.



In **Rewa,** the Municipal Corporation extended the effort beyond backlanes to improve the cleanliness and appearance of front lanes across all wards. Murals and wall paintings were created, while play equipment and musical instruments were developed using the principles of the **3Rs-Reduce, Reuse, and Recycle.** The walls also feature English and Hindi vowels and alphabets, numbers and multiplication tables. By integrating cleanliness with learning and recreational elements, the initiative has helped create **safer, more engaging and child-friendly neighbourhood spaces.**



In **Agra,** the Agra Municipal Corporation successfully cleaned and maintained **nine backlanes** across the city. **The Urban Learning Internship Program (TULIP) trainees** actively participated in the campaign, while local residents contributed to the cleaning and beautification of neighbourhood streets. Their participation demonstrates how community involvement can strengthen local ownership of cleanliness and support the sustained upkeep of shared public spaces.

From Safety to Opportunity

For **Jyotsna Dhabde of Bhopal,** access to institutional credit provided an opportunity to pursue entrepreneurship. At a Bhopal Municipal Corporation loan fair, she received a loan under the **Swachhta Udyami Yojana,** which enabled her to purchase a sanitation vehicle. In New Delhi, Raja, a supervisor with the New Delhi Municipal Council, shared his experience of **mechanised sewer cleaning.**

> Raja says, "Earlier, we were compelled to enter the sewers to carry out sewer cleaning. But with the introduction of modern machines, the work is now executed using machines. In addition, being provided with safety gear such as gumboots, masks, safety glasses, helmets, and other protective equipment makes us feel safer."

Together, these experiences illustrate efforts to make sanitation work safer, more skilled and more dignified.

The Safai Mitra Suraksha Challenge 2021 focused on health education, the provision and use of safety equipment, worker welfare and reduction of occupational risks. Under Swachh Bharat Mission–Urban 2.0, the Ministry of Housing and Urban Affairs (MoHUA) has emphasised the provision of protective equipment, training and safety awareness by Urban Local Bodies (ULBs), to work towards zero fatalities in sanitation work.

As a pioneer in this space, Chandigarh has prohibited hazardous manual sewer cleaning since 2018. An Emergency Response Sanitation Unit (ERSU), operating under the Responsible Sanitation Authority (RSA), supports safer sanitation practices by providing Personal Protective Equipment (PPE), safety gear and regular medical check-ups.



In **Assam, 83 of 96 Urban Local Bodies (ULBs)** declared themselves **SafaiMitra Surakshit Shehar** in 2023. The state mapped **5,230 sanitation workers** and organised **92 health camps.** In **Maharashtra, 246 Master Trainers** were prepared during the first phase, followed by training for **1,917 sanitation workers. Uttar Pradesh** supported SafaiMitras by facilitating access to credit and livelihood opportunities. Together, these measures seek to strengthen the **safety, social and economic security, dignity and entrepreneurial opportunities** of SafaiMitras, creating pathways from sanitation work towards **sani-entrepreneurship.**

From Preparedness to Community Action

As the rains arrive, the real value of pre-monsoon preparedness becomes visible on the ground. A cleared drain allows rainwater to flow freely, a clean street prevents waste buildup, and an early health camp helps communities spot and contain disease risks before they spread. At the heart of each measure is the active participation of citizens, making public health a shared responsibility.

From the hills of the Northeast to the streets of Delhi, and across communities in Telangana, Chhattisgarh, Madhya Pradesh, and Uttar Pradesh, the campaign has taken diverse, localized forms. Yet underlying them all is a single unified truth: **true monsoon preparedness is not merely about reacting to rainfall, but about preparing together —one street, one neighbourhood, and one community at a time.**

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Integrated Transport and Logistics Authority (ITLA)

A comprehensive National Transport Master Plan

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India's Expanding Transport and Logistics Network

As India's economy grows, so does the need to move goods efficiently across the country. Meeting this requirement calls for transport networks that are well connected and planned as an integrated system. To support these growing requirements, the Government on **6 October 2026** approved the setting up of the **Integrated Transport & Logistics Authority (ITLA).** ITLA will serve as a specialised institutional mechanism for **research, planning, project appraisal, monitoring and impact assessment across transportation and logistics.**

With the expansion of the transport and logistics networks, ITLA will **support long-term integrated planning and post-implementation impact assessment of infrastructure projects.** It will complement existing initiatives such as the **PM GatiShakti National Master Plan** and the **National Logistics Policy.**

Roles and Responsibilities

ITLA will undertake a range of responsibilities covering integrated planning, project appraisal, monitoring, data analytics, logistics policy, capacity building and research. Its key responsibilities include:

- **National Apex Institution:** ITLA will serve as the apex institution for integrated transport and logistics planning, research, project appraisal and monitoring. It will provide **policy support and data analytics** to strengthen coordinated decision-making across the transport sector.
- **Long-Term National Transport Master Plan:** The authority will prepare a comprehensive **National Transport Master Plan** with a planning horizon of **10 years or more.** It will cover **roads, railways, ports and shipping, civil aviation, inland waterways, coastal shipping, urban mobility and logistics.**
- **Integrated Planning Framework:** It will evaluate short-term sectoral plans with a horizon of around five years and annual plans of transport Ministries. Also, it will ensure their alignment with the **National Transport Master** Plan and promote **multimodal infrastructure development.**
- **Technical Appraisal of Major Projects:** ITLA will undertake technical appraisal of Government of India infrastructure projects costing **₹500 crore or more.** Financial appraisal will continue to be carried out through the existing financial appraisal mechanisms.
- **Monitoring and Impact Assessment:** It will monitor transport and infrastructure projects costing **above ₹500 crore** and provide a coordinated mechanism for issue resolution. It will also undertake **post-implementation impact assessments** to evaluate project outcomes and performance.
- **National Transport Data Repository (NTDR):** The authoirty will develop a unified transport data repository by integrating relevant transport and logistics datasets from multiple sources. These include **GSTN e-way bills, FASTag, Vahan, GPS-based systems and urban traffic management systems.** The data will support freight-flow and origin-destination analysis for planning, monitoring and impact assessment.



- **Logistics Policy Support:** It will advise and assist in the review and updating of the National Logistics Policy (2022).
- **Capacity Building:** It will contribute to capacity building, training, and skilling in the logistics sector.
- **Research and Innovation:** It will promote research & innovations in transport and logistics sectors.

Key Benefits

ITLA will strengthen integrated planning, coordination, data use and institutional capacity across the transport and logistics ecosystem:

- **Central institutional mechanism:** ITLA will serve as a central institutional mechanism for research, planning, appraisal, monitoring and impact assessment in transport and logistics. This approach follows **global practice** in line with other countries such as Korea, Japan, the US, China and Australia.
- **Unified infrastructure planning:** ITLA will act as the apex coordinating agency for unified infrastructure planning. It will also prepare a comprehensive **National Transport Master Plan.**
- **Inter-ministerial coordination:** ITLA will enable synergy and coordination among ministries dealing with transport and logistics. This will cover infrastructure planning, appraisal, monitoring and evaluation.
- **Integrated data repository:** ITLA will create a unified transport data repository. This will support evidence-based planning, research and innovation.
- **Institutional capacity building:** ITLA will strengthen capacity in research, planning, big data integration, project monitoring and evaluation. It will also promote the adoption of international best practices.

Supporting India's Vision 2047

As India's transport and logistics networks continue to expand, **seamless multimodal connectivity and efficient infrastructure** will become increasingly important. ITLA will strengthen integrated planning, project appraisal, monitoring and data-driven decision-making across the transport and logistics ecosystem. By improving infrastructure efficiency, supporting multimodal connectivity and building institutional capacity, **ITLA will contribute to India's Vision 2047 and a more competitive logistics ecosystem.**

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