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Theme

Basic Infrastructure

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Dhyeya's Yojana Gist

October, 2023

Voyage to study the Earth's Sun

Aditya-L1 is India's inaugural space mission dedicated to studying the Sun. After several orbit-raising maneuvers and approximately four months of cruising, the spacecraft will enter a halo orbit around the Sun-Earth system's Lagrange point 1 (L1), positioned roughly 1.5 million km from Earth. Aditya-L1 is equipped with seven payloads designed to observe the Sun's photosphere, chromosphere, and corona using various detectors for electromagnetic radiation, particles, and magnetic fields.

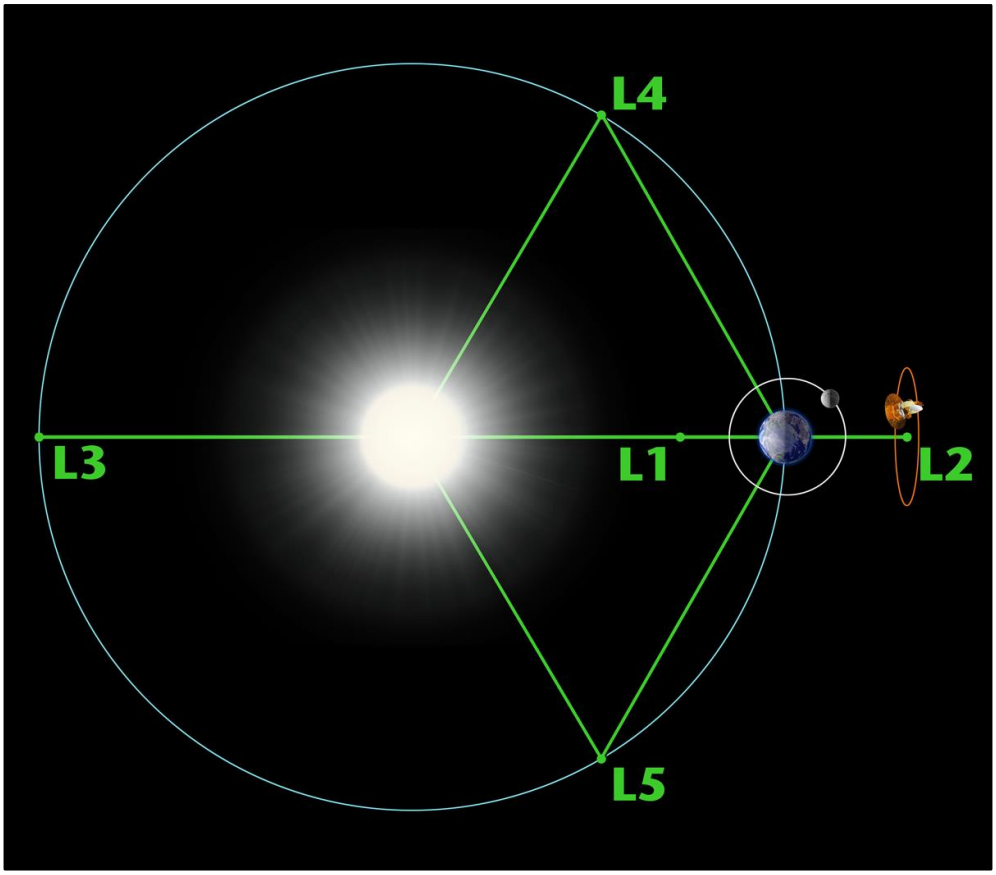
The Sun

- The Sun is the closest star and the largest object in our solar system.
- Its estimated age is approximately 4.5 billion years.
- The Sun is primarily composed of hot, glowing hydrogen and helium gases.
- The Earth is situated about 150 million kilometers away from the Sun.
- The Sun is the primary source of energy for our solar system.
- Solar energy is essential for life on Earth as we know it.
- The Sun's gravitational force keeps all the objects within the solar system in orbit around it.
- The Sun's core, at the central region, reaches temperatures as high as 15 million degrees Celsius due to nuclear fusion, which powers the Sun.
- The visible surface of the Sun called the photosphere, has a relatively cooler temperature of about 5,500°C.

Aditya-L1

- Aditya-L1 is India's inaugural space-based observatory-class solar mission designed to study the Sun.
- It is placed in a halo orbit around the Sun-Earth Lagrange point 1 (L1), allowing for continuous and unobstructed observations of the Sun, free from eclipses or occultations.
- This unique vantage point offers a significant advantage in the continuous monitoring of solar activities.
- Aditya-L1 is equipped with seven payloads, four of which directly observe the Sun, while the remaining three focus on in-situ studies of particles and fields at the Lagrange point L1.
- The mission's suite of payloads is expected to provide critical insights into various aspects of solar research, including coronal heating, Coronal Mass Ejection (CME), pre-flare and flare activities, space weather dynamics, particle and field propagation in the interplanetary medium, and more.

Lagrange Points



- Lagrange Points are positions in space where a small object tends to stay in a two-body gravitational system.
- These points are particularly useful for spacecraft as they allow them to stay in position with reduced fuel consumption.
- Lagrange points occur when the gravitational pull of two large bodies (such as the Sun and Earth) equals the necessary centripetal force for a small object to move with them.
- In a two-body gravitational system, there are a total of five Lagrange points, denoted as L1, L2, L3, L4, and L5.
- L1 is located along the Sun-Earth line and is approximately 1% of the Earth-Sun distance away from Earth.

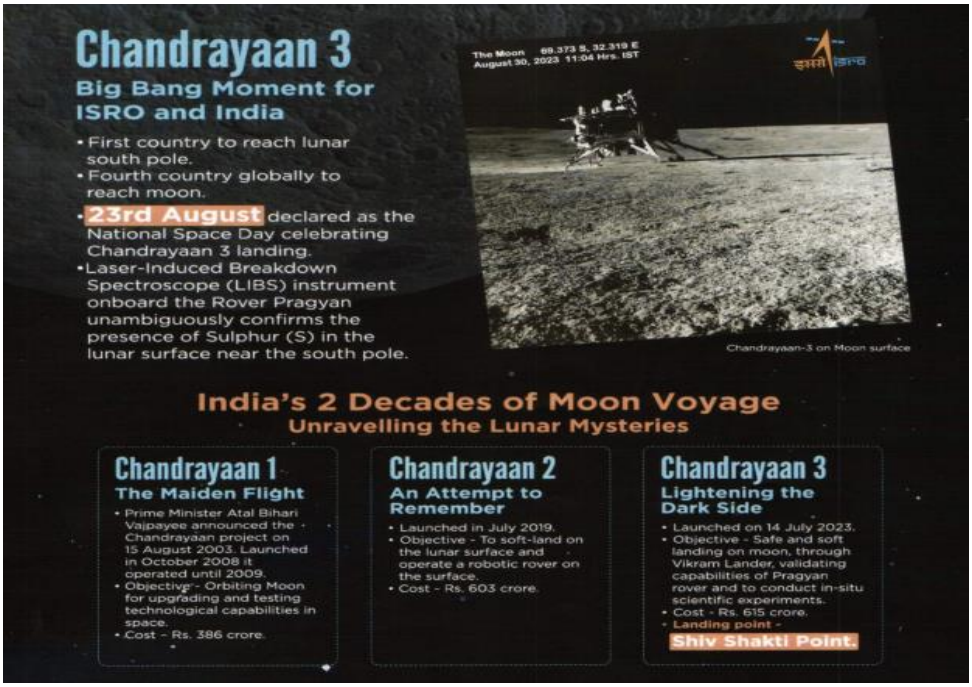
Why Study Sun from Space?

- The sun emits radiation/light in nearly all wavelengths along with various energetic particles and a magnetic field.

- The atmosphere of Earth as well as its magnetic field acts as a protective shield and blocks a number of harmful wavelength radiations including particles and fields.
- Some solar radiations are unable to reach the Earth's surface, making it impossible for instruments on Earth to detect them.
- To study these radiations and conduct solar research based on them, observations must be made from space.
- Spacecraft used for scientific payloads are limited in terms of mass, power, and volume, allowing only a specific set of instruments with limited capacity.
- Aditya-L1 will perform all measurements from the Lagrange point L1, which has its limitations. For instance, Aditya-L1 alone cannot capture the directional distribution of energy from multi-directional solar phenomena.
- Another Lagrange point, L5, offers a favorable vantage point for studying Earth-directed Coronal Mass Ejections (CME) and assessing space weather.
- Technological challenges have made it difficult to study the polar regions of the Sun from spacecraft orbits. These regions play a crucial role in understanding solar cycles and the dynamics of solar magnetic fields.
- Polarization measurements of solar radiation at various wavelengths are necessary to comprehend the processes occurring in and around the Sun.

CHANDRAYAAN-3: INDIA'S SUCCESSFUL LUNAR MISSION

- On 23 August 2023, India achieved its first successful Moon landing with Chandrayaan-3's Automatic Landing Sequence (ALS) of the Lander, Vikram, near the Moon's South Pole. India became the fourth country in the world to land on the lunar surface.
- Chandrayaan-3 was launched on LVM3-M4 from the Satish Dhawan Space Centre on 14 July 2023. It consisted of two parts: the propulsion module and the Lander-Rover modules, all developed indigenously.



- The mission aimed not only to demonstrate India's capability for safe lunar landing and roving but also to conduct in-situ scientific experiments related to the Moon's atmosphere, soil, and minerals.
- The successful landing of the Vikram Lander paved the way for India's future lunar missions and technological advancements in interplanetary exploration.
- India's space journey, from its first sounding rocket to a successful lunar mission, reflects remarkable growth in the Indian space sector.
- India's space achievements are attributed to the dedication and hard work of thousands of scientists, engineers, and technicians who believed in Dr. Vikram Sarabhai's vision.
- ISRO's achievements include the Mars Orbiter Mission (Mangalyaan), the 'AstroSat' space astronomy observatory, and the regional navigation satellite system known as NavIC (IRNSS).
- ISRO has signed agreements and MoUs with various countries and international organizations for joint missions and technology transfers.
- Beyond launching satellites and exploring space, ISRO has integrated space applications into various aspects of governance, such as agriculture, water resources, rural development, disaster management, and more.
- To involve the Indian private sector in space activities, IN-SPACe (Indian National Space Promotion and Authorization Centre) was established, enabling policy changes and providing opportunities for private companies and startups.
- ISRO collaborates with over 150 space startups, fostering innovation and advancement in the space sector.
- India's space sector has made significant progress in recent years, inspiring scientific curiosity among the youth and encouraging their involvement in the field of space exploration and technology.
- India's space achievements underscore its position as a pioneer in the global space sector, exemplifying the 'Make in India' brand in space exploration.

Space Infrastructure

- The initiation of India's space program began in 1962 with the establishment of the Indian National Committee for Space Research (INCOSPAR) and the launch of the Thumba Equatorial Rocket Launching Station (TERLS) near Thiruvananthapuram. In 1969, the Indian Space Research Organisation (ISRO) was founded, and in 1972, the Space Commission and the Department of Space (DOS) were formed.
- ISRO, India's leading space agency, focuses on space technology for national and global benefit. It operates under the Department of Space, managing activities through various centers and units. ISRO's key objectives include developing space systems for communication, broadcasting, meteorology, resource management, and navigation, as well as launching satellites using vehicles like PSLV and GSLV.
- Two public sector enterprises, Antrix Corporation Ltd. and New Space India Ltd., focus on commercializing DOS's R&D efforts.
- In addition to technological endeavors, ISRO promotes science and education by running research centers and institutions for fields like remote sensing, astronomy, atmospheric sciences, and space sciences. ISRO conducts lunar and interplanetary missions, and scientific projects to advance science education and provide valuable data.
- The DOS Secretariat and ISRO Headquarters are located in Antariksh Bhavan, Bengaluru. ISRO's program offices coordinate various activities, including satellite communication, earth observation, navigation, launch vehicles, space science, disaster management, sponsored research, human spaceflight, international cooperation, systems reliability, safety, budget analysis, human resources, capacity building, and public outreach.

Key ISRO Centers:

Vikram Sarabhai Space Centre (VSSC), Thiruvananthapuram: Focuses on launch vehicle technology, with expertise in various aerospace disciplines. Manages programs like PSLV, GSLV, LVM3, Rohini Sounding Rockets, Small Satellite Launch Vehicles (SSLV), and Reusable Launch Vehicles (RLV), and contributes to human spaceflight endeavors like Gaganyaan.

U R Rao Satellite Centre (URSC), Bengaluru: Leads the design and development of communication, navigation, remote sensing, scientific, and small satellite missions. Provides a wide range of satellite applications, including telecommunications, television broadcasting, telemedicine, navigation, weather forecasting, and more.

ISRO Satellite Integration and Test Establishment (ISITE): Established in 2006, it assembles and tests spacecraft from basic structures to flight-worthy status.

Satish Dhawan Space Centre (SDSC)-SHAR: Known as the 'Spaceport of India,' it supplies launch base infrastructure for ISRO's space missions, accommodating the diverse requirements of launch vehicles and satellite operations.

Liquid Propulsion Systems Centre (LPSC): Responsible for advanced propulsion systems for launch vehicles and spacecraft, including earth storable, cryogenic, semi-cryogenic, and electric propulsion. LPSC operates across two campuses in Thiruvananthapuram and Bengaluru, conducting research, design, and development activities in propulsion and structures.

Space Applications Centre (SAC), Ahmedabad: Specializes in developing space and air-borne instruments for communication, navigation, and remote sensing, serving both government and private sectors. SAC contributes to the INSAT and GSAT satellite series, facilitating services like VSAT, DTH, Internet, broadcasting, and more.

Human Space Flight Centre (HSFC): Established in 2019, HSFC is a hub for human space flight endeavors. It conducts multidisciplinary R&D, focusing on the Gaganyaan mission, encompassing mission planning, module development, life support systems, astronaut selection and training, simulators, and collaborations with national and international agencies. Currently located in Bengaluru.

National Remote Sensing Centre (NRSC): Tasked with ground stations, satellite data acquisition, remote sensing applications, disaster management support, geospatial services, and capacity building. NRSC operates through multiple campuses to address national and regional geospatial requirements.

ISRO Propulsion Complex (IPRC), Mahendragiri: Manages assembly, integration, and testing of liquid propulsion systems for launch vehicles. It is responsible for engine qualification, testing, and acceptance for various space missions, including interplanetary endeavors, with state-of-the-art facilities.

ISRO Telemetry, Tracking and Command Network (ISTRAC): Primarily responsible for telemetry, tracking, command, and mission control services for ISRO's launch vehicles, laboratory for electro-optics systems, and interplanetary spacecraft missions. ISTRAC also works on radar systems for launch vehicle tracking, meteorological applications, search and rescue, disaster management, and telemedicine support.

Master Control Facility (MCF): Manages on-orbit and launch phase operations for geostationary/geosynchronous and IRNSS-class spacecraft. MCF operates from Hassan, Karnataka, and Bhopal, providing control for communication, meteorological, and navigational payloads.

ISRO Inertial Systems Unit (IISU), Thiruvananthapuram: Focuses on developing inertial systems for launch vehicles and satellites, including navigation systems, attitude reference systems, and actuator mechanisms.

Laboratory for Electro-Optics Systems (LEOS), Bengaluru: Specializes in designing attitude sensors, high-resolution imaging optics, and science instruments for spacecraft, encompassing various sensor systems and optical components.

Indian Institute of Remote Sensing (IIRS), Dehradun: Primarily involved in capacity building and education in remote sensing and geoinformatics, offering programs for mid-career professionals, graduates, policymakers, academia, industry, and NGOs.

Development and Educational Communication Unit (DECU), Ahmedabad: Leads the implementation of satellite-based societal applications in India, focusing on system definition, planning, implementation, and social research. DECU collaborates with user agencies to address various communication needs.

Physical Research Laboratory (PRL), Ahmedabad: An autonomous research institute engaged in fundamental research in various areas, including astronomy, astrophysics, planetary science, atmospheric sciences, and more.

National Atmospheric Research Laboratory (NARL): Conducts cutting-edge research in atmospheric and space sciences, with a focus on predicting atmospheric behavior through observations and modeling. Provides high-resolution data on upper air winds and supports rocket launches.

North Eastern-Space Applications Centre (NE-SAC): A joint initiative of DOS and the North Eastern Council, NE-SAC provides space-based support in governance and development, including natural resource management, healthcare, education, disaster management, and atmospheric science research in the North Eastern Region.

Indian Institute of Space Science and Technology (IIST): Established in 2007, IIST offers education in space science and technology, including undergraduate, postgraduate, doctoral, and post-doctoral programs. It fosters research and development in space studies.

Antrix Corporation Limited (ACL): Provides space sector products and services worldwide, including hardware and software supply, earth observation missions, remote sensing data services, transponder lease services, launch services, and more.

New Space India Limited (NSIL): A wholly-owned Government of India undertaking responsible for space sector activities, including commercial ventures, under the administrative control of DOS.

Indian National Space Promotion and Authorization Centre (IN-SPACe): An independent agency formed to regulate and authorize the activities of private enterprises and startups in the space sector, enhancing space technology diffusion and promoting the space economy in India. IN-SPACe permits and oversees space activities and infrastructure sharing.

Conclusion

India's space program, initiated in 1962, has grown into a significant force in space technology. ISRO, with its dedicated centers and units, has achieved milestones in satellite communication, navigation, and space science. It promotes scientific research and education, extending its reach to lunar and interplanetary missions. The collaboration with public enterprises and the opening of the space sector to private enterprises through IN-SPACe illustrate India's commitment to space technology for national and global benefit.

■■■

Road Infrastructure getting smarter

- The roads, both in number and quality, have been an important driver for economic development and social inclusion.
- India ranks second globally in total road length, with a CAGR of 3.64% from 1991 to 2019. In contrast, the CAGR from 1951 to 1991 was 4.50%, albeit on a smaller base. The growth in road infrastructure has been remarkable, adding approximately 40 lakh km over the last 28 years, compared to about 19 lakh km in the preceding 40 years.
- Notably, National Highways (NH) have seen the highest CAGR since 1991 at 5.02%, followed by rural roads at 4.67%. As of March 31, 2023, the figures stand at 1,44,955 km of NH and 1,67,079 km of SH.

National Highways (NH)	State Highways (SH)	District Roads	Rural Roads	Urban Roads	Project Roads	Total
1,32,499	1,79,535	6,12,778	45,22,228	5,41,544	3,43,163	63,31,757
5.02	1.24	0.66	4.67	3.87	1.77	3.64

- India has prioritized improving penetrative connectivity in rural areas by implementing the Pradhan Mantri Gram Sadak Yojana (PMGSY) since 2001. This initiative has significantly enhanced access and spurred development. Rural roads, which make up more than 70% of India's total road network, have been a focal point of this effort.

Evolution of Road Development in India:

In the recent three decades, the emphasis has been more on quality, leading to better speeds and all-weather connectivity. Various organizational innovations and technologies have enabled this.

Pre-liberalization focus:

- Before liberalization, road development in India [Nagpur Plan (1943-1963), Bombay Plan (1961-81), Lucknow Plan (1981-2001)], was closely linked to generating direct employment.
- This emphasis on labor-intensive construction methods limited road quality until the late 90s when capital-intensive, high-tech equipment was introduced.

National Highways Authority of India (NHAI):

- NHAI was established in February 1995 to directly oversee the development of national highways (NHs). It was always said that 2% of India's roads (essentially the NHs) carried 40% of the traffic.

Year (as on 31 March)	NH length (kms)	Year (as on 31 March)	NH length (kms)
2011	70,934	2017	1,14,158
2012	76,818	2018	1,26,350
2013	79,116	2019	1,32,500
2014	91,287	2020	1,32,500
2015	97,991	2021	1,38,376
2016	1,01,011	2022	1,41,345
		2023	1,44,955

- Prior to NHAI, NH development, and maintenance were the responsibility of individual states with central funding. NHS carried a significant portion of the country's traffic.

Introduction of Public-Private Partnerships (PPPs):

- Initial discussions on PPPs began in 1996, but early concession agreements were skewed in favor of the government, deterring private investment in financing, construction, and operation and maintenance (O&M) of roads.
- PPPs were initially limited to low-traffic segments like bypasses and road overbridges.

State-Level Road Development Corporations:

- As NHAI gained momentum, many states established dedicated road development entities, such as the Maharashtra State Road Development Corporation Limited (MSRDCL) in 1996.
- These corporations encouraged PPPs and the development of expressway-standard roads, with Uttar Pradesh leading the way.

National Highways Development Project (NHDP):

- NHDP, initiated in 1998 under NHAI, included seven phases covering 49,260 km of the NH network.
- Phase 1 focused on four-laning the Golden Quadrilateral (GQ), connecting major metro cities, while Phase 2 expanded to connect the north-south and east-west corridors.
- The remaining NHDP works were incorporated into the Bharatmala Pariyojana in 2018.

Pradhan Mantri Gram Sadak Yojana (PMGSY):

- This successful project focuses on rural road development, with its achievements attributed to objective-based village selection, oversight by independent agencies (including the World Bank), and its placement under the Ministry of Rural Development rather than the Ministry of Road Transport and Highways (MoRTH).

- PMGSY has led to spin-off projects like the Mukhya Mantri Gram Sadak Yojana (MMGSY) in states looking for faster rural road development.

Viability Gap Funding (VGF):

- The NHAI introduced VGF as a bidding criterion with a 40% project cost cap, spurring interest among bidders and encouraging PPP projects in subsequent NHDP phases.
- The VGF model has been adopted in other infrastructure sectors

Evolution of the Model Concession Agreement (MCA):

- The road sector's first MCA was introduced in 2000. Over the past decade, various aspects of risk allocation between PPP players and authorities have been addressed, promoting continuous improvement.
- These changes encompassed revenue sharing, site handover, state support agreements, and standards compliance.

Focus on Expressways:

- India's journey in constructing access-controlled expressways began with the Mumbai-Pune Expressway in 2002. Although expressway development had a slow start, significant progress has been made over the last decade.
- As of August 2023, India boasts around 5,000 km of operational expressways, with an additional 9,000 km under construction. Ambitious plans propose an additional 20,000 km of expressways.

New Contracting Models:

- India has adopted innovative models over the past decade. The Hybrid Annuity Model (HAM) offers better risk allocation to private players, with the authority contributing 40% of the capital cost and the remaining 60% paid to the private entity over 30 years.
- The Toll, Operate, and Transfer (TOT) model allows private entities to collect tolls and maintain built roads during the concession period. Asset monetization is facilitated through Infrastructure Investment Trusts (InVIT).

Specialized Organizations:

- Apart from NHAI, specialized organizations have been established to achieve specific objectives. The Indian Highways Management Company Limited (IHMCL) was formed in 2012 for electronic tolling.

- The National Highways and Infrastructure Development Corporation Limited (NHIDCL) focuses on road development projects in Border States, while the National Highways Logistics Management Limited (NHLML) was established in 2020 for Multi-Modal Logistics Parks (MMLPs) and port connectivity projects.

Road-Making Technologies:

- Over the years, we have learned to increase the rate of road surface construction (including setting records in the Samruddhi expressway), construct better bridges at a lower cost, and tunnel through mountains and environmentally sensitive areas.
- New and environmentally sustainable materials are being experimented with and used where they are found acceptable.

Electronic Toll Collection (ETC):

- Slow initial adoption, with 5% penetration in 2017, increasing to 96% by 2022.
- Average daily ETC of Rs 90 crore in 2021-22 through 55 lakh transactions.
- Evolve ETC technology to enable seamless, high-speed electronic payments, eliminating the need for vehicles to slow down.

Road Safety Focus:

- Inadequate road design and construction practices contributing to road accidents.
- Lack of buffer lanes for right turns and at entrances and exits.
- Need for improved crash barriers and immediate replacement.
- Low-quality roads for traffic diversion during construction leading to congestion.
- Insufficient scientific signage for visibility and to prepare drivers for speed changes.
- Unregulated roadside parking.

Lane Kilometres vs. Road Kilometres:

- Emphasize the measurement of lane kilometers over road kilometers to reflect both access and capacity.
- Include lane information in road maps for better decision-making by road users.

Co-ordination with PPP Players:

- Resolve disputes efficiently between PPP players and authorities to prevent project delays and inconvenience to road users.
- Overcome contractual conflicts that hinder the expansion of two-lane highways into four-lane roads.

Conclusion

In conclusion, India's road infrastructure has made significant progress over the years, with a focus on quality, connectivity, and innovation. The introduction of new contracting models, specialized organizations, and road-making technologies has transformed the sector. However, challenges remain, particularly in enhancing road safety, addressing urban road needs, and improving coordination with PPP players. To further advance, the evolution of electronic toll collection and the emphasis on lane kilometers, along with the continued expansion of expressways, will be essential. Overall, India's road infrastructure continues to play a pivotal role in the nation's economic development and social inclusion.

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RAIL INFRASTRUCTURE

Indian Railways serve as a vital mode of transportation for both freight and passengers, facilitating various activities such as business, tourism, pilgrimage, and education. The railway's growth and development have played a significant role in India's economic, industrial, and social progress.

Key Features of Railway's Infrastructure

- The railway network in India has been a unifying force for over 167 years, contributing to the economic growth of the nation.
- Indian Railways started in 1853 with a 34 km route from Mumbai to Thane and has since expanded to encompass 7,308 stations and 68,043 km of routes.
- A substantial portion of the railway network is electrified, covering 74.06% of route kilometers, 80.38% of running track kilometers, and 78.46% of total track kilometers.
- The railway network is divided into 17 zones to manage operations efficiently.
- Railway planning aims to expand infrastructure to accommodate growing traffic and support economic development.
- Nine five-year plans have been implemented since the planned era began in 1950-51, focusing on system modernization and technological advancements.
- Investments in modernization and upgrades have become necessary to meet the rising demand for rail transport and ensure cost-effective operations.
- Technological advancements have been initiated in areas like track, locomotives, passenger coaches, wagon designs, signaling, and telecommunication.

Zonal Railways	Headquarters
Central	Mumbai
Eastern	Kolkata
East Coast	Bhubaneswar
East Central	Hajipur
Northern	New Delhi
North Central	Allahabad (Prayagraj)
North Eastern	Gorakhpur
Northeast Frontier	Maligaon (Guwahati)
North Western	Jaipur
Southern	Chennai
South Central	Secunderabad
South Eastern	Kolkata
South East Central Railway	Bilaspur
South Western Railway	Huballi
Western	Mumbai
West Central Railway	Jabalpur
Metro Railway	Kolkata

Research Design and Standards Organisation (RDSO):

- RDSO is the R&D wing of Indian Railways.
- It functions as a consultant to the Indian Railways in technical matters.
- Provides consultancy to other organizations connected with railway manufacture and design.
- Successfully conducted Balancing Speed and controllability trials of Vande Bharat Express between Kasara Igatpuri and Karjat Lonavala sections of the Central Railway.
- Collaborated with IIT, Kharagpur to develop the automation tool (SigDATE) for generating route control charts for Electronic Interlocking systems.

Railway Finance:

- The Railway Budget was presented separately to Parliament until the Budget Year 2017-18, after which it was merged with the general Budget.
- The Separation Convention of 1924 led to the separate presentation of the Railway Budget.
- The merger of the budgets provides a holistic view of the government's financial position.
- The merger facilitates multimodal transport planning between Highways, Railways, and Waterways.
- Railways maintain their distinct entity as a departmentally run commercial undertaking.
- The Ministry of Finance introduced one demand for grants for the Ministry of Railways.

Railway Electrification:

- Indian Railways' Mission 100% Electrification policy is essential for reducing crude oil imports and providing environmental benefits.
- Electric traction offers a better quality of service, higher speeds, and increased loadings for both freight and passenger trains.
- Electrification supports modernization and economic development.
- It aligns with the goal of providing clean transport, reducing the carbon footprint, and promoting environmentally friendly transport.
- Electrification has been growing steadily since independence in 1947.
- By March 2023, electrification had covered 58,812 Route Kilometers (RKMs), constituting 90% of the total Broad Gauge (BG) Railway Network.

Rail Tourism

Indian Railways (IR) plays a significant role in promoting tourism in India by connecting various tourist destinations across the country by rail. Here are key points regarding rail tourism in India:

1. Theme-Based Tourist Circuit Trains:

- The Bharat Gaurav Trains Policy allows various entities such as State Governments, State Tourism Development Corporations, or other service providers to operate theme-based tourist circuit trains covering destinations of their choice.
- These trains are designed to provide tourists with a comprehensive package that includes rail transportation, accommodation, meals, local road transport, and sightseeing.

2. Domestic Tourism Promotion:

- The Ministry of Railways is committed to promoting domestic tourism. To achieve this, they are providing better quality LHB (Linke-Hofmann-Busch) coaches under the Bharat Gaurav Train policy.
- Additionally, there is a 33% concession in charges due to the Railway for promoting rail-based tourism under the Bharat Gaurav Train scheme. This concession aims to make train travel more affordable for tourists.

3. Specialized Tourism Products:

- Indian Railways, in collaboration with the Indian Railway Catering and Tourism Corporation (IRCTC) and selected states, introduces specialized tourism products.
- These products are often train-based and offer unique travel experiences to tourists, such as luxury and heritage train journeys.

Conclusion

The Indian Railways, with its extensive network and modernization efforts, serves as a vital driver of economic, industrial, and social progress in India. Its electrification initiatives, merger of budgets, and commitment to domestic tourism through theme-based trains showcase its adaptability and role in India's holistic development. The Railways' role in connecting tourist destinations and offering specialized tourism products further underscores its significance in promoting tourism, contributing to the country's cultural and economic growth.

NATIONAL RAIL PLAN- 2030

Vision:

- The NRP aims to transform the Indian Railways into a more efficient and competitive mode of transportation by 2030.
- The capacity and infrastructure development are designed not only to meet current demands but also to accommodate expected growth in rail traffic until 2050.
- This long-term perspective ensures that investments made today will remain relevant for decades to come, enhancing the sustainability and robustness of the railway network.

Key Objectives:

- **Increase Modal Share:** The NRP emphasizes the importance of strategies that enhance the market share of rail transport in the overall freight sector. This includes policies to attract more shippers to rail and to create an efficient and reliable service.
- **Faster Freight Transit:** By increasing the average speed of freight trains to 50 kmph, the NRP seeks to reduce transit times for cargo, making rail transport more competitive and attractive to businesses.
- **Vision 2024:** The Vision 2024 component of the NRP is a short-term plan that focuses on quick wins and critical projects. It targets key areas such as electrification, route expansion, and speed upgrades on vital routes, aligning with the broader goals of the NRP.
- **Dedicated Freight Corridors:** The identification of new Dedicated Freight Corridors is part of the strategy to create dedicated, high-capacity rail routes for freight transportation. These corridors will help streamline cargo movement and reduce congestion on existing lines.
- **High-Speed Rail Corridors:** The inclusion of High-Speed Rail Corridors in the NRP demonstrates the commitment to developing modern, high-speed rail networks for passenger transportation, promoting faster and more efficient travel between key urban centers.
- **Rolling Stock and Locomotives:** Assessing the rolling stock and locomotive requirements ensures that the railway system is equipped with the right equipment to meet both passenger and freight needs efficiently. The focus on electrification aligns with environmental goals.

- **Investment Requirements:** Determining the capital investment needs and their periodic breakdown helps in planning and securing the necessary funding for implementing the NRP effectively, ensuring financial sustainability.
- **Private Sector Involvement:** Encouraging private sector involvement in various railway operations and infrastructure development areas fosters collaboration, innovation, and efficiency in the rail sector. This approach can help leverage private sector expertise and resources to enhance railway services and infrastructure.

VANDE BHARAT EXPRESS TRAINS

- Indian Railways launched India's first indigenous semi-high-speed train, Vande Bharat Express, as a significant success story of the 'Make in India' campaign.
- The inaugural Vande Bharat Express train commenced operations on the New Delhi-Kanpur-Allahabad-Varanasi route on 15 February 2019.
- Vande Bharat Express aims to upgrade maintenance technologies and methodologies for enhanced productivity and performance, covering reliability, availability, utilization, and efficiency.
- This semi-high-speed train offers world-class passenger amenities and can achieve higher speeds due to faster acceleration and deceleration, reducing journey times by 25% to 45%.

Vande Bharat trains feature modern coaches with advanced safety features and amenities:

1. Operate at speeds of up to 160 km/hr.
2. Fully sealed gangways for free passenger movement.
3. Automatic plug doors for passenger safety.
4. Comfortable seating with ergonomic reclining seats, including revolving seats in the executive class.
5. Improved ride comfort.
6. Mobile charging sockets for every seat.
7. Mini pantry with facilities such as a hot case, bottle cooler, deep freezer, and hot water boiler.

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8. Mini pantry with facilities such as a hot case, bottle cooler, deep freezer, and hot water boiler.
9. Adequate and diffused lighting.
10. Special lavatory for Divyangjan (specially-abled) passengers.
11. Emergency openable windows and fire extinguishers in each coach.
12. CCTV surveillance in all coaches.
13. Emergency alarm push buttons and talk back units in all coaches.
14. Advanced regenerative braking system for energy efficiency, saving up to 30% of electrical energy.
15. Enhanced fire safety with aerosol-based fire detection and suppression systems.
16. Driver-Guard communication with voice recording and crash-hardened memory.
17. Coach Condition Monitoring System (CCMS) display with remote monitoring.
18. Disaster lights with four platform side cameras, including rear-view cameras outside each coach.

- As of 28 July 2023, 50 Vande Bharat train services operate on the Indian Railways, connecting states with a Broad Gauge (BG) electrified network.
- The introduction of such trains, including Vande Bharat services, remains an ongoing process, contingent on operational feasibility and traffic justification.
- Vande Bharat Express represents a remarkable achievement in India's rail travel experience, offering high speed, advanced safety standards, and world-class service to passengers.

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Port Infrastructure in Gujarat

- Gujarat is a highly industrialized state in India, known for its manufacturing in sectors such as chemicals, petrochemicals, dairy, pharmaceuticals, cement, ceramics, textiles, gems and jewelry, and engineering. Industrialization has driven the development of transport and logistics infrastructure in the state.
- Gujarat's strategic location, boasting the longest coastline in India (1,600 km), and connectivity to major global trade routes make it a key player in maritime development in the Arabian Sea and the Indian Ocean.
- The state comprises 49 ports, including one major port (Deendayal Port Authority) and 48 non-major ports spread across south Gujarat, Saurashtra, and Kachchh regions.
- Gujarat handles approximately 40% of all cargo at Indian ports.
- It was the first state in India to establish a legal framework for Public-Private Partnerships in the infrastructure sector.
- The Gujarat government has introduced its own viability gap funding scheme for infrastructure projects.
- With a Gross State Domestic Product (GSDP) of INR 19.44 lakh crore in 2021-22 (constituting 8.21% of India's GDP), Gujarat is a significant contributor to the country's economy.
- In the fiscal year 2023-24, the Central Government has allocated over INR one thousand crore for 12 port projects in Gujarat as part of the SagarMala Port development projects.

Logistical Infrastructure Development

- Non-major ports in Gujarat saw port capacity utilization of 542 MMT in FY 2019, with expectations of reaching over 750 MMT by FY 2027.
- The only major port in Gujarat, Deendayal Port Authority, had a capacity of 282 MMT in FY 2023-24, projected to reach 392 MMT by 2030.
- Several Greenfield and brownfield capacity augmentation projects are proposed along the Gujarat coastline to support economic development.

Key areas of development include:

- Developing Greenfield liquid terminals and berths to accommodate increasing LPG imports and blending facilities in chemical manufacturing and trading areas in South and Central Gujarat.
- Establishing satellite ports to enhance trade with western coastal states, reducing road congestion and the carbon footprint.
- Developing Grade A warehousing, rail freight terminals, and Multi-Modal Logistics Parks to boost EXIM trade and logistics sector throughput.
- Enhancing road and rail connectivity for multi-modal and uninterrupted cargo movement.
- The PM GatiShakti National Master Plan includes comprehensive port connectivity projects, and Gujarat has 23 projects among the 174 Port Connectivity Projects in India.
- Notable road and rail connectivity projects in Gujarat include the upgradation of Tuna Road, widening the approach road to Navlakhi Port, and rail connectivity and capacity augmentation for Nargol Port, connecting it to the dedicated freight corridor.
- Gujarat has established petrochemical infrastructure at ports, including three LNG Terminals in Dahej, Hazira, and Mundra, with connections to the state's Gas Transmission and Distribution Network. Dahej is India's first dedicated Chemical port.

Greenfield projects (Ports under development)
• Tuna Tekra: Developed by Deendayal Port Authority (DPA) as the container port with capacity of 2.19 MTEU
• Chhara: Developed by GMB with 1 no. of Coal berth of 8 MMTPA capacity in initial phase.[8]
• Dahej: The port is being developed by GMB with the total port capacity in Phase I & II of 41 MMTPA.[8]
• Nargol: Developed by GMB for facilities of Container and Bulk cargo berth, with the total port capacity of around 10 MMTPA.[8]

Sustainable Infrastructure Development

- Gujarat leads in electricity generation capacity, boasting 37.35 GW of installed capacity in 2023.
- A substantial portion, 16.34 GW or 43.74%, is derived from renewable energy sources.
- Gujarat is the second-highest producer of wind energy in the country, with a capacity of 9.21 GW, primarily situated along its coast.
- The Ministry of New and Renewable Energy has proposed offshore wind farms in Gujarat and Tamil Nadu to promote the blue economy and renewable energy.
- Mithi Virdi, located south of Bhavnagar, is considered a potential site for a port to support a 20 GW offshore power plant for wind energy logistics.
- Plans for the production of green hydrogen and ammonia are set between 2025-2030 at Kandla, Paradeep, and Tuticorin.
- Gujarat has implemented various measures to reduce environmental pollution, improve solid waste management, achieve water neutrality, and develop green infrastructure within port premises and along the coast, with collaboration from research institutes.
- Initiatives align with the Maritime India Vision 2030 for Sustainable and Green Ports, emphasizing sustainability and environmental responsibility.
- The Swachh Bharat Special Campaign 3.0 promotes sustainability, with projects like 'Swachh Gandhidham' aiming to create a Clean and Sustainable Port City. Components include Information, Education, and Communication activities on solid waste management and the commissioning of dry and wet waste processing plants, with the potential for a Construction and Demolition Processing Plant in the future.

Strategic Developmental Projects

- Gujarat has a significant shipbuilding industry, with nine operational shipbuilding yards, eight under execution, and six in the approval process.
- The state aims to create cluster-based shipyards, known as Marine Shipbuilding Parks (MSP), along the Gujarat coast. Two locations have been approved: the North bank of the Narmada River in Dahej and the Old Bhavnagar port.
- The Indian government's Shipbuilding Financial Assistance Policy provides financial support to Indian shipyards for contracts signed between April 1, 2016, and March 31, 2026. The assistance is set at 20% of the 'Contract Price' or the 'Fair Price,' determined by international valuers, for vessels built in India post-delivery. The assistance decreases by three percent every three years from 2018-19 onwards.

- The Gujarat Maritime Cluster aims to bring together maritime service providers, financial institutions, regulatory agencies, and academicians to accelerate integrated maritime sector development in the state.
- The Gujarat International Maritime Arbitration Centre, located in GIFT City, manages arbitration and mediation for maritime and shipping-related disputes.
- Agencies involved in the Gujarat Maritime Cluster include the Gujarat Maritime Board, International Financial Services Centres Authority, Gujarat International Finance Tec-City, and Gujarat Maritime University.
- The commercial maritime cluster developed by the Gujarat Port and Infrastructure Development Company Ltd. at GIFT City provides support and intermediate services for maritime, education, research, insurers, legal advisors, consultants, banks, and financial institutions.
- The state government plans to establish a Shipbuilding University in the district of Kachchh.

Strengthening of Policy and Institutional Framework

- To develop the port sector and create a favorable maritime environment that attracts investment and enhances competitiveness, the following key policies have been implemented:

Port Policy, 1995[14]	The Policy integrates the development of ports with industrial development, power generation, and infrastructure development.
BOOT Policy, 1997[15]	The BOOT principles serve as a framework for involvement of private sector in the construction and operation of the new ports.
The Gujarat Infrastructure Development Act, 1999[16] and its Subsequent amendment, 2006[17]	An ACT to provide for a framework for participation by persons other than the State and other Government agencies in financing, construction, maintenance and operation of infrastructure projects. Hence, establishes the Board for appraisal and resolution of related matters.
Shipbuilding Policy, 2010[18]	To streamline and integrate development in shipbuilding sector to optimise utilisation of available and planned infrastructure
Ship Recycling Regulations, 2015[19]	Conditions and procedures for grant of permission to Ship recycling plot on the basis of its utilisation

Conclusion

Gujarat is making substantial strides in its strategic planning and infrastructure development, particularly in the maritime and port sectors. Major ports and states in the region are finalizing their Port Master Plans 2047, with a focus on significantly increasing port capacity from 2600 MMTPA to over 10,000 MMTPA by 2047. These master plans revolve around the concept of Port-Led development, encompassing projects related to Port Modernization, Port Connectivity, Port-led Industrialization, Coastal Community Development, Coastal Shipping, and Inland Water Transport. The development isn't confined to industrial and logistical aspects alone. Initiatives like the Smart Industrial Port City at Kandla-Gandhidham and proposed Coastal Economic Zones under the Sagarmala Project ensure sustainable city planning and equitable growth along the vast coastline. Moreover, theme-based cruise circuits and Ro-Ro/Ro-Pax circuits enhance coastal connectivity and promote water transport as a preferred mode of communication. With the government's facilitation of 100% Foreign Direct Investment (FDI) in the shipping sector and tax exemptions, Gujarat is poised for further expansion and interconnected development.

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AGRI INFRASTRUCTURE

India, in the 1950s and 1960s, faced food shortages and relied heavily on wheat imports, reaching a peak in 1966 with a 'ship-to-mouth' situation. However, the Green Revolution transformed the scenario. With high-yielding crop varieties, government support, and agricultural research, India's wheat and rice production surged, reducing the need for imports. India started exporting rice, becoming a leading global rice exporter. This transition from food deficit to surplus production is a significant achievement in India's post-independence history.

Trends in Agricultural Production

- **Increase in Food Grain Production:** Food grain production in India has risen from 51 million tonnes (MT) in 1950-51 to over 330 MT in 2022-23. This significant increase has positively impacted food and nutritional security.
- **Rice and Wheat Production:** The production of rice and wheat has increased substantially due to improved irrigation and power infrastructure, as well as the adoption of modern agricultural practices, including high-yielding crop varieties and the use of fertilizers and pesticides.
- **Coarse Cereals and Millets**: The production of coarse cereals and millets has increased to 55 MT in 2022-23, with a shift from pearl millet and sorghum to maize, driven by demand from the poultry industry. The government is promoting millet cultivation for its environmental and health benefits.
- **Pulses Production:** India is the largest producer and consumer of pulses, with overall pulse production increasing from 8.4 MT in 1950-51 to 27 MT in 2022-23. However, per capita availability has declined, and the government is taking measures to incentivize pulse production.

Table 1. Area and production of major crops during 1950-51 and 2022-23

	Area (million hectares)			Production (million tonnes)		
	1950-51	2022-23*	Times increase	1950-51	2022-23*	Times increase
Foodgrains	97.32	132.2	1.36	50.82	330.53	6.50
Cereals	77.42	103.07	1.33	42.41	303	7.14
Rice	30.81	47.66	1.55	20.58	135.54	6.59
Wheat	9.75	31.82	3.26	6.46	112.74	17.45
Coarse cereals/Millets	37.67	23.58	0.63	15.38	55.95	3.64
Pulses	19.09	29.13	1.53	8.41	27.5	3.27
Oilseeds	10.73	30.09	2.80	5.16	40.99	7.94

*Note: * 3rd Advance Estimates*

- **Edible Oils:** India has faced challenges in achieving self-sufficiency in edible oils due to import dependence. The government has introduced measures to promote domestic oilseed production, including the National Food Security Mission on Oilseeds and the National Mission on Edible Oil—OilPalm.
- **Fruits and Vegetables:** Production of fruits and vegetables has increased significantly, driven by rising per capita income. However, challenges include perishability, seasonality, and price volatility. Infrastructure like processing centers and cold chains is needed to reduce wastage and maintain a stable supply.
- **Cotton and Sugarcane:** The adoption of Bt cotton led to a significant increase in cotton production. However, resistance in pests poses challenges. India is a leading sugarcane producer, but production fluctuates due to factors like monsoon deficits. The government's ethanol-blending program aims to address these challenges.
- **Agricultural Infrastructure**: The National Agriculture Infra Financing Facility, launched in 2020, aims to address agricultural infrastructure issues.
- **Mechanization:** The promotion of custom hiring centers for agricultural machinery is expected to benefit the adoption of mechanization in agriculture.

Agricultural Resources and Inputs

- **Net Area Sown and Population Growth:** The net area sown for crops in 2019-20 was 139.90 million hectares, compared to 118.75 million hectares in 1950-51. However, the population growth during the same period was 3.8 times higher, creating a challenge to meet the growing demand for food with limited increases in cultivated land.
- **Intensive Cultivation and Yield Enhancement:** Intensive cultivation and higher yields became essential to meet the rising food demand. This was made possible through the cultivation of High-Yielding Varieties (HYV) and the application of fertilizers and pesticides.
- **Agricultural Research and Crop Varieties:** Since 1950, the Indian Council of Agricultural Research has released more than 6000 crop varieties, contributing to increased agricultural production.
- **Fertilizer Application:** Fertilizer consumption has increased significantly, from 0.53 kg per hectare in 1950-51 to 140.97 kg per hectare in 2019-20. Government subsidies incentivized farmers to apply larger amounts of fertilizers.

- **Fertilizer Subsidies:** To encourage the judicious use of fertilizers, a nutrient-based subsidy scheme was introduced in 2010 and revised in May 2023. Neem-coated urea was introduced to reduce wastage and diversion of subsidized fertilizer.
- **Irrigation:** The creation of vast irrigation potential, including programs like the Command Area Development Programme and the Accelerated Irrigation Benefit Programme, significantly increased the net irrigated area. Groundwater irrigation plays a crucial role, but overexploitation in water-intensive crops has sustainability concerns.

Table 2. Irrigation and Fertiliser trend

	1950-51	2019-20	Increase by times
Net sown area (Million hectares)	118.75	139.90	1.17
% of net irrigated area	17.55	53.39	3.04
gross area sown (Million hectares)	131.89	211.36	1.6
Fertiliser consumption (Million tonnes)	0.698	29.796	42.68
per ha fertiliser in kg	0.53	140.97	265.98

- **Water Management:** To promote sustainable water use for irrigation, the government initiated the 'More Crop per Drop' program under the Pradhan Mantri Krishi Sinchayee Yojana in 2015-16. Crop diversification is also being encouraged.

Price Policy and Market

- **Minimum Support Prices (MSP):** The Indian government fixes MSP for 23 commodities each year based on recommendations from the Commission for Agricultural Costs and Prices. MSP assures farmers of remunerative and stable prices, which is crucial for increasing agricultural production and productivity.
- **Price Support Scheme:** Food grain procurement at MSP, particularly for rice and wheat, provides protection to farmers against price volatility. Pulses and oilseeds are also procured at MSP under the Price Support Scheme, which includes the Price-Deficient Payment method for more flexibility.
- **Agricultural Markets:** Agricultural markets are regulated under the Agricultural Produce Market Committee Act in most states, allowing traders to buy from farmers at market yards. The National Agricultural Market (e-NAM) was launched as a digital platform to integrate 1260 APMC mandis across 22 states and 3 union territories, facilitating online trading of various agricultural commodities.
- **Digital Transformation:** Digital Public Infrastructure, including Agristack and Krishi Decision Support System, uses modern technologies like Artificial Intelligence and Machine Learning to provide inclusive solutions for crop planning, access to farm

inputs, credit, insurance, crop estimation, market intelligence, and support for the Agri-Tech industry and startups.

- **Resilience to Climate Change:** Agriculture is highly weather-dependent, and there are challenges in sustaining food production and making agriculture resilient to climate change, especially in rainfed areas. The government has implemented schemes like the National Mission for Sustainable Agriculture (NMSA) and National Innovations in Climate Resilient Agriculture (NICRA) to address these challenges.
- **Commodity Production and Imports:** While Indian agriculture has transformed from a traditional, low-production, food-deficit sector to a modern, surplus food-producing sector, domestic production for certain commodities like pulses and oilseeds cannot meet the growing demand, leading to significant imports to bridge the shortfall.

Conclusion

In conclusion, while the success of Indian agriculture has been remarkable, it has also brought forth new challenges. The over-reliance on groundwater for water-intensive crops has led to the depletion of vital groundwater resources in certain regions. Furthermore, India's heavy dependence on the monsoon makes its agriculture vulnerable to the unpredictable effects of climate change.

To overcome these challenges and sustain future agricultural production, India must embrace technological solutions, particularly in the realm of digital technology. By doing so, it can bolster its agricultural sector, make it more resilient to the vagaries of nature, and ensure that it continues to thrive in the face of evolving environmental and climate conditions. With favorable government policies and advanced technology, Indian agriculture is poised to surge ahead as a modern and robust force in ensuring food security for the nation.

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GLOBAL STARTUP ECOSYSTEM

Startups have become catalysts for economic rejuvenation and growth, driven by their innovative approaches. They aspire to shape a future that is both decentralized and collaborative, customized to meet the unique requirements and changing values of each country. Startup 20 is the latest Engagement Group introduced during the Indian G20 Presidency, with the goal of aligning the global startup ecosystem and fostering cooperation across various industries and domains of work.

Status and Significance of Global Startup Ecosystem

- The global startup industry, currently valued at approximately $3 trillion in a world economy of $90 trillion, is undergoing rapid growth and disruption.
- Startups have risen as catalysts for reviving, reorganizing, and expanding economies, driven by their innovative spirit. Their goal is to shape a decentralized yet collaborative future that aligns with the specific needs and evolving values of each nation.
- Startups are increasingly offering platforms and technologies that facilitate cross-border collaboration and innovation, assisting economies in achieving the Sustainable Development Goals. Consequently, startups play a vital role in job creation, advancing technology, fostering sustained growth, and effectively addressing global challenges.
- India has emerged as the third-largest startup ecosystem globally. Through the launch of Startup20 during its G20 Presidency, India aims to position itself as a worldwide hub for startups.

Five Task Forces to Empower Global Startup Ecosystem (Under G-20)

The five Task Forces within Startup20 have collaborated to reach a consensus, resulting in a Policy Communique that encapsulates the new era of innovation and technology and its influence on the global startup ecosystem.

1. Foundations:

- Focus on creating consensus-based definitions and terminology to strengthen startup ecosystems within and across G20 nations.
- Develop a handbook for startups to strengthen the Startup20 foundation.

2. Finance:

- Concentrate on policies and frameworks for a favorable policy environment for startup financing.
- Create a supportive environment by providing networking and launch opportunities.

- Enable measures to facilitate the cross-border flow of capital across G20 Nations.
- India encourages G20 hu Nations to increase their joint annual investment in the global startup ecosystem to US$ 1 trillion by 2030.

3. Alliance

- Alliances are critical for scaling businesses in domestic and international markets.
- The recommendations and policy directives address challenges faced by startups when expanding to international markets, navigating regulatory requirements, accessing mentor networks, finding entrepreneurial talent, and collaborating with larger corporations and governments.
- Emphasis is placed on creating a framework for global partnerships and fostering cross-country collaboration.

4. Inclusiveness:

- Offer recommendations and policy directives to promote inclusivity and diversity in the global startup ecosystem.
- Support startups that prioritize inclusion.

5. Sustainability:

- Work towards establishing mechanisms to accelerate startups addressing significant Sustainable Development Goals (SDG) gaps.
- Focus on areas of common interest to all countries or groups requiring special attention, such as women entrepreneurs and people with disabilities.

G20 Communique:

- The G20 summits culminate in 'The Communique,' an official statement expressing consensus. Startup20, an engagement group under the G20, produced its policy communique.
- These included virtual and physical public consultations called Startup20 Sabha.
- Stakeholders from G20 countries discussed and provided feedback on the Policy Communique.
- Representatives from 24 countries, including G20 and invitees, participated.
- Introduced task forces and their objectives to a broader audience.
- Feedback was shared during discussions.

Additional Initiatives

- Startup20 also worked on creating a Startup Handbook with common definitions and terminologies for the startup ecosystem.
- It aimed to establish a Global Innovation Centre fostering cross-border collaboration.
- Efforts to promote Startup20 as a Global Point of Contact for startup ecosystems worldwide were underway.
- The group aimed to develop a startup financing framework to enable financing of startups across G20 member nations.

Government Initiatives to Foster Startups in India:

Startup India Initiative:

- Launched in January 2016, the initiative has recognized over 69,000 startups in India as of May 2022.
- These startups span 56 diverse sectors, including IT services (13%), health and life sciences (9%), education (7%), professional and commercial services (5%), agriculture (5%), and food and beverage (5%).

Key Functions:

- Development of enhanced infrastructure, including incubation centers.
- Streamlined facilitation of intellectual property rights (IPR), making patent filing more accessible.
- Creation of a more favorable regulatory environment, offering tax benefits, simplified compliance, ease of company setup, quicker exit mechanisms, and more.
- Introduction of an economic stimulus in the form of an INR 10,000 crore Fund of Funds managed by SIDBI to increase funding opportunities.
- Latest Findings: According to data from the Ministry of Commerce and Industry, startups covered under the Start-up India initiative employed approximately 1.74 lakh people in 2021.
- **Start-Up India Programme:** A flagship initiative aimed at nurturing innovation and startups to drive sustainable economic growth and generate significant employment opportunities.
- **Start-up India Digital Platform**: The world's largest virtual incubator, with over 300,000 registered startups and aspiring entrepreneurs.
- **Start-up Grand Challenge**: Facilitates collaboration between Indian and Korean startups to develop solutions for global challenges.

Conclusion

India's G20 presidency is committed to promoting consensus among member nations through transparent discussions. While the G20 focuses on social protection, financial inclusion, the digital economy, health, technology, sustainability, and economic growth, the engagement groups aim to make these discussions participatory and open to the public, fostering Jan Bhagidari.

India's goals include raising $1 trillion in annual investment for the global startup ecosystem by 2030, harmonizing the global startup landscape, and continuing the Startup20 group in future G20 presidencies. The presidency also emphasizes gender equality and empowerment.

The G20, originally for crisis management, now serves as a forum for economic growth and stability. Each presidency brings unique narratives, and India focuses on collaboration and consensus-driven decisions.

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UNITY MALLS

Unity Malls are being established in each Indian state, designed to serve as comprehensive marketplaces for One District One Product (ODOP), products with Geographical Indicator (GI) tags, and locally crafted handloom and handicraft items.

Purpose and funding allocation for the Unity Malls initiative

- **Initiative's Purpose:** This initiative is part of the government's commitment to infrastructure development, capital investment, and stimulating progress towards 'Make in India' and 'Atmanirbhar Bharat' initiatives. It also aims to support local artisans, create employment opportunities, facilitate skill development, promote local cuisine, celebrate cultural heritage, boost tourism, and contribute to overall economic prosperity.
- **Dedicated Shops for Each District:** Each Unity Mall will feature a dedicated shop for every district within the state, showcasing its unique products. Additionally, a shop in each Unity Mall will be dedicated to each state in India to sell their GI products, ODOP offerings, and other regional products.
- **ODOP Initiative:** The One District One Product initiative, led by the Government of India, focuses on revitalizing local manufacturing, generating jobs, reducing economic disparities, and promoting equitable regional growth. It involves identifying and promoting unique products with cultural significance from various districts.
- **Geographical Indication (GI)**: GI tags certify the product's origin, offering assurance of quality and unique characteristics associated with its specific geographical area. GI designations serve as trademarks in domestic and international markets.
- **Scheme for Special Assistance to States:** This scheme, introduced in 2020-21, aims to stimulate capital expenditures by State governments, especially considering resource limitations due to the COVID-19 pandemic. It provides funds in the form of interest-free loans to States for capital investment, not affecting their annual borrowing limits.
- **Funding for Unity Malls:** A substantial amount of Rs 5,000 crore has been earmarked for the construction of Unity Malls under the Scheme for Special Assistance to States for Capital Investment 2023-24. The funds are allocated to States based on the number of districts, and States are expected to provide land for the malls free of cost.

Table – 1: State-wise allocation of funds for the construction of Unity Malls

S. N.	Name of State	Allocation (Rs in crores)
1	Andhra Pradesh	172
2	Arunachal Pradesh	188
3	Assam	226
4	Bihar	223
5	Chhattisgarh	202
6	Goa	100
7	Gujarat	202
8	Haryana	155
9	Himachal Pradesh	132
10	Jharkhand	163
11	Karnataka	193
12	Kerala	120
13	Madhya Pradesh	284
14	Maharashtra	215
15	Manipur	149
16	Meghalaya	132
17	Mizoram	127
18	Nagaland	145
19	Odisha	189
20	Punjab	159
21	Rajasthan	202
22	Sikkim	106
23	Tamil Nadu	223
24	Telangana	202
25	Tripura	114
26	Uttar Pradesh	382
27	Uttarakhand	136
28	West Bengal	159
	Total	**5000**

Mall Design and Amenities

- **Guidelines for Unity Malls:** The Department of Expenditure in the Ministry of Finance, Government of India, has issued comprehensive guidelines for the construction of Unity Malls. These guidelines emphasize the architectural design to symbolize India's unity and grandeur.
- **Standardized Signage Design**: Unity Malls must adhere to a standardized signage design prescribed by the Department for Promotion of Industry and Internal Trade (DPIIT), incorporating the One District One Product (ODOP) and Make in India logos. Multilingual signage is encouraged to showcase linguistic diversity.
- **Commercial Spaces:** Each Unity Mall must include a minimum of 36 commercial spaces, with one designated for each State or Union Territory (UT) to promote ODOP

products. Commercial spaces for every district within the State should be of equal size.

- **Essential Features:** Unity Malls should include essential features such as food courts, parking facilities, spaces for recreational and cultural activities, conference areas, exhibitions, and technology-driven experiences like virtual reality and interactive kiosks. Accessibility and compliance with National Building Code standards are crucial.
- **Financial Assistance:** States are encouraged to provide financial assistance to enable sellers from distant regions and remote districts to participate. Promotional initiatives should be undertaken to establish Unity Malls as cultural hubs and tourist attractions.
- **Public-Private Partnership Model:** Unity Mall's operation and maintenance will be structured under a Public-Private Partnership (PPP) model. The State government will retain ownership, while private parties will handle operations and maintenance during a 30-year concession period. A Model Concession Agreement should be provided.
- **Artisan Inclusion:** Artisans without dedicated spaces will have opportunities to display and sell their products in allocated exhibition spaces within the mall.

Conclusion

The establishment of Unity Malls in each Indian state signifies a pivotal step in promoting economic growth, cultural diversity, and local craftsmanship. This initiative aligns with the government's 'Make in India' and 'Atmanirbhar Bharat' goals while supporting artisans, creating jobs, and celebrating regional heritage. With dedicated shops for every district and state, these malls aim to foster unity and prosperity, ensuring equitable growth and development. The Public-Private Partnership model ensures long-term sustainability, making Unity Malls a testament to India's collective progress.

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