

YOJANA SUMMARY

INFRASTRUCTURE

OCTOBER 2023

PM VISHWAKARMA

- A new scheme, called **PM Vishwakarma**, aims at improving the quality as well as the reach of products and services of artisans and craftspeople.
- It also aims to ensure that the Vishwakarmas are integrated into the domestic and global value chains.
- PM Vishwakarma will be implemented as a Central Sector Scheme, fully funded by the Government of India.
- The Scheme will be conjointly implemented by the **Ministry of Micro, Small and Medium Enterprises**, the **Ministry of Skill Development and Entrepreneurship**, the Department of Financial Services, and the Ministry of Finance, Government of India.
- The support provided through this Scheme will not only contribute to the preservation of cultural practices, generational skills, and guru-shishya parampara but will also provide an identity and recognition to them.
- **Components of PM Vishwakarma:**
 - Recognition: PM Vishwakarma Certificate and ID Card,
 - Skill Upgradation,
 - Toolkit Incentive,
 - Credit Support,
 - Incentive for Digital Transactions, and Marketing Support.

VOYAGE TO STUDY THE EARTH'S SUN

- Aditya-L1 is the first space-based Indian mission to study the Sun. The spacecraft shall be placed in a **halo orbit around the Lagrange point 1 (L1)** of the Sun-Earth system, which is about 1.5 million km from the Earth.
- The spacecraft carries seven payloads to observe the photosphere, chromosphere and the outermost layers of the Sun (the corona) using electromagnetic and particle and magnetic field detectors.

The Sun

- The estimated age of sun is about 4.5 billion years. It is a hot glowing ball of hydrogen and helium gases. The distance to the sun from the earth is about 150 million kilometres.
- The gravity of the sun holds all the objects of the solar system together.
- At the central region of the sun, known as 'core', the temperature can reach as high as 15 million degrees Celsius.
- At this temperature, a process called nuclear fusion takes place in the core which, powers the Sun.
- The visible surface of the sun known as photosphere is relatively cool and has temperature of about 5,500°C.

About Aditya-L1

- Aditya-L1 is the **first space-based observatory** class Indian solar mission to study the Sun.
 - A satellite placed in the halo orbit around the L-1 point has the major advantage of continuously viewing the Sun without any occultation/ eclipse.
- The suit of Aditya-L1 payloads are expected to provide most crucial information to understand the problems of coronal heating, Coronal Mass Ejection, pre-flare and flare activities, and their characteristics, dynamics of space weather, study of the propagation of particles, and fields in the interplanetary medium, etc.

Lagrange Points

- For a two-body gravitational system, the Lagrange Points are the positions in space where a small object tends to stay, if put there.

- Technically at Lagrange point, the gravitational pull of the two large bodies equals the necessary centripetal force required for a small object to move with them.
- For two body gravitational systems, there are total five Lagrange points denoted as L1, L2, L3, L4 and L5. **The Lagrange point L1 lies between Sun-Earth line.**

Why Study Sun from Space?

- The sun emits radiation/light in nearly all wavelengths along with various energetic particles and magnetic field.
- The atmosphere of the Earth as well as its magnetic field acts as a protective shield and blocks a number of harmful wavelength radiations including particles and fields.
- As various radiations don't reach the surface of the Earth, the instruments from the Earth will not be able to detect such radiation and solar studies based on these radiations could not be carried out.
- However, such studies can be carried out by making observations from outside the Earth atmosphere i.e., from space.

Challenges of Aditya -L1

- The various phenomena of the sun are multi-directional and therefore the directional distribution of energy of explosive/eruptive phenomena will not be possible to study with Aditya-L1 alone.
- Also, the polar regions of the sun are not well studied due to technological challenges of achieving spacecraft orbits for such studies.
 - The sun polar dynamics and magnetic fields are believed to play important role in deriving the solar cycles.

CHANDRAYAAN-3: INDIA'S SUCCESSFUL LUNAR MISSION

- On 23 August 2023, the Chandrayaan-3 Lander, Vikram soft-landed on the lunar surface.
 - 23rd August declared as the **National Space Day** celebrating Chandrayaan 3 landing.
- This made India the fourth country in the world to land on the lunar surface and the first country ever to land near the south pole of the Moon, a region that has never been explored before.

India's Space Journey

- India's space journey, from launching its first sounding rocket to a successful Lunar Mission, has been remarkable. With successful space missions in recent years, India has now taken the brand of Make in India to the Moon.
- ISRO's various projects including the **Mars Orbiter Mission (MOM)**, **AstroSat**-India's first dedicated Space Astronomy Observatory, **IRNSS**- India's own regional navigation satellite system (also known as NavIC) are not only demonstrating India's capabilities in space technology, but also establishing India as a pioneer in the global space sector.
- To empower India in the field of space by enabling the participation of the Indian private sector, **IN-SPACE (Indian National Space Promotion and Authorization Centre)** was created.
- Presently, ISRO is working with over 150 space startups that have emerged within a short span of time.

SPACE INFRASTRUCTURE

- Space activities in the country were launched with the establishment of the **Indian National Committee for Space Research (INCOSPAR)** in 1962.

- In August 1969, the **Indian Space Research Organisation (ISRO)** was established.
- In June 1972, the **Space Commission** and the **Department of Space (DOS)** were constituted, and ISRO was brought under the DOS in September 1972.
- The Space Commission formulates the policies and oversees the implementation of the Indian space programme to promote the development and application of space science and technology for the socio-economic benefit of the country.
- **Antrix Corporation Ltd.** and **New Space India Ltd.** are the two central public sector enterprises set up for the commercialisation of R&D activities of DOS.

Major Establishments of DOS

A. Vikram Sarabhai Space Centre (VSSC)

- VSSC, Thiruvananthapuram, is responsible for the design and development of launch vehicle technology. The major programmes at VSSC include the (PSLV) (GSLV) (LVM3) etc.

B. UR Rao Satellite Centre (URSC)

- URSC, Bengaluru, is the lead centre for design, development, and the realisation of communication, navigation, remote sensing, scientific, and small satellite missions.
- URSC has built complex and advanced satellites for various applications in areas of telecommunications, television broadcasting, VSAT services, tele-medicine, etc.

C. Satish Dhawan Space Centre (SDSC)-SHAR

- SDSC-SHAR, the Spaceport of India, is the backbone of the ISRO in providing launch base infrastructure for the Indian Space Programme.

D. Liquid Propulsion Systems Centre (LPSC)

- LPSC is the lead centre of ISRO for the design, development, and realisation of advanced propulsion systems for launch vehicles and space propulsion systems for spacecrafts.

E. Space Applications Centre (SAC)

- SAC, Ahmedabad, is a major research and development centre of ISRO. The core competence of the Centre lies in the development of space-borne and air-borne instruments and payloads and their applications for national development and societal benefits.
- SAC develops optical and microwave sensors for satellites, signal and image processing software, GIS software, and many applications for the Earth Observation programme of ISRO.

F. Human Space Flight Centre (HSFC)

- HSFC was formed in 2019 as a lead centre for human space flight activities. It is currently concentrating on the Gaganyaan mission.
- The centre is currently operating from the ISRO-HQ campus, Bengaluru.

G. National Remote Centre (NRSC)

- NRSC has the mandate for the establishment of ground stations for receiving satellite data, generation of data products, aerial remote sensing data acquisition, etc.
- It develops techniques for remote sensing applications including disaster management support, geospatial services for good governance, and capacity building for professionals, faculty, and students.

H. ISRO Propulsion Complex (IPRC)

- IPRC, Mahendragiri is responsible for the assembly, integration, and testing of liquid propulsion systems for operational and developmental launch vehicles.

- IPRC is also responsible for the qualification, testing and acceptance of liquid engines, cryogenic engines, spacecraft engines, and thrusters, and provides a platform for simulation trials for interplanetary missions.

I. ISRO Telemetry, Tracking and Command Network (ISTRAC)

- ISTRAC, is entrusted with the primary responsibility of providing Telemetry, Tracking and Command (TTC), and mission control services to major Launch Vehicle, Laboratory for Electro-Optics Systems (LEOS) and Interplanetary Spacecraft missions of ISRO.
- It has the additional responsibility of operating the complex Ground Segment of NavIC.

J. Master Control Facility (MCF)

- MCF is responsible for On-Orbit Operations (OOP) and Launch & Early Orbit Phase (LEOP) operations of geostationary/ geosynchronous & IRNSS class of spacecrafts of ISRO.
- The facilities located at Hassan and Bhopal together now take care of GEOSAT and IRNSS class spacecrafts with payloads classified into communication, meteorological, and navigational categories.

K. Indian Institute of Remote Sensing (IIRS)

- IIRS, Dehradun, is a premier institute with a primary aim to build capacity in Remote Sensing and Geoinformatics & their applications through education and training programmes at postgraduate level.

L. National Atmospheric Research Laboratory (NARL)

- NARL, located at Gadanki near Tirupati, is an autonomous organisation engaged in cutting- edge research in atmospheric and space sciences with the vision of developing capability to predict the behaviour of the earth's atmosphere through observations and modelling.

M. North Eastern-Space Applications Centre (NE-SAC)

- NE-SAC is an autonomous organisation under the DOS and is a joint initiative of DOS and the North Eastern Council (NEC).
- The Centre coordinates with the State Remote Sensing Application Centres of the North Eastern Region (NER) and acts as a nodal centre for the implementation of major national and regional programmes requiring space-based inputs.

N. Indian Institute of Space Science and Technology (IIST)

- IIST, Asia's first Space University, was established at Thiruvananthapuram in 2007 to offer high-quality education in space science and technology to meet the demands of the Indian Space Programme.

O. Antrix Corporation Limited (ACL)

- Antrix Corporation Limited with its corporate office in Bengaluru is a wholly-owned Government of India company under the administrative control of DOS.

P. New Space India Limited (NSIL)

- NSIL got incorporated in 2019, as a wholly-owned Government of India Undertaking/Central Public Sector Enterprise (CPSE), under the administrative control of the DOS.
- NSIL has been categorised as Schedule 'A' CPSE by the Dept. of Public Enterprises (DPE) in 2020.

Q. Indian National Space Promotion and Authorization Centre (IN-SPACE)

- As the space sector was opened up to private enterprises and startups an independent nodal agency under DOS, the Indian National Space Promotion and Authorization Centre (IN-SPACE) was formed.
- IN-SPACE permits and oversees the activities of private enterprises and startups. It regulates space activities, including the building of launch vehicles and satellites and providing space-based services as per the definition of space activities.

- It permits the sharing of the space infrastructure of ISRO and the establishment of temporary facilities within the premises of ISRO.
- IN-SPACe operates with its headquarters in Ahmedabad and field offices in Bengaluru and Mumbai.

ROAD INFRASTRUCTURE GETTING SMARTER

India has the **second-longest road length among all countries** (the USA has the longest road length). The CAGR of total road length since 1991 to 2019 has been 3.64%.

Pradhan Mantri Gram Sadak Yojana (PMGSY)

- There has been attention to penetrative connectivity by providing **all-weather roads in rural areas** through the PMGSY.
- This project was initiated in 2001 and has played a major role in improving access and consequent development. Rural roads constitute over 70% of the total road length in India.

Various Organisational Innovations And Technologies In Road Sector:

- **Delinking Road Development and Direct Employment:** In the period until liberalisation, while there was planned focus on road development, it was also connected with direct employment generation. This resulted in labour intensive means of construction, putting a cap on the quality of roads. It was only in the late 90s when this mindset changed and the use of capital-intensive high-tech road making equipment was brought in.
- **Creation of National Highways Authority of India (NHAI):** in February 1995. Prior to NHAI, the NH development and maintenance was the responsibility of the state with funding from the Centre.
- **Bringing in Public-Private Partnerships (PPP)**
- **Creation of State-Level Road Development Corporations:** These corporations promoted PPPs where possible. Some states are also developing Expressway-standard roads. Uttar Pradesh is a leader in this.
- **Starting the National Highways Development Project (NHDP):** This project was started under NHAI in 1998 and consequently grew to seven phases. Phase 1 consisted of four-laned the Golden Quadrilateral (GQ), connecting the four major metro cities. In 2018, with most of the NHDP having been completed, the remaining works were subsumed under the larger **Bharatmala pariyojana**.
- **Providing Viability Gap Funding (VGF):** The approach to the initial phases of NHDP was to leverage PPPs. Based on discussions with stakeholders, including contractors who could be PPP players, the idea of mitigating risks by providing a VGF came up.
- **Evolution of the Model Concession Agreement (MCA):** The first MCA for the road sector was brought out in 2000. Beyond the VGF, many other aspects of better allocation of risk between the PPP player and the authority were addressed.
- **Focus on Expressways:** The first access- controlled expressway was opened between Mumbai and Pune in 2002. As of August 2023, India has about 5000 km of operational expressways, with another 9000 km under construction.
- **New Contracting Models and Asset Monetisation:** Apart from the classical tendering through the Engineering, Procurement, and Construction (EPC) or the PPP through the Build, Operate, and Transfer (BOT), the Hybrid Annuity Model (HAM) and Toll, Operate, and Transfer (TOT) have emerged as acceptable operating models over the past decade.
 - In the HAM, there is better risk allocation to the private player, who must build and operate the road, without being vulnerable to toll revenues.

- Further, 40% of the capital cost is provided by the authority. The remaining 60% is paid to the private player over 30 years in biannual installments.
- In the **TOT model**, a built road is offered to the private player for toll collection and maintenance over the concession period.
- To enable asset monetisation of built roads, the idea of **Infrastructure Investment Trusts (InVIT)** has been operationalised.
- **Focussed Organisations:** In December 2012, the Indian Highways Management Company Limited (IHMCL) was set up to carry out electronic tolling. This was followed by the National Highways and Infrastructure Development Corporation Limited (NHIDCL) to carry out road development projects in the border states. The **National Highways Logistics Management Limited (NHLML)** was set up in 2020 for developing Multi Modal Logistics Parks (MMLPs) and the first/last mile port connectivity projects.
- **Road-Making Technologies:** As the NHDP was rolled out, the import of road-making equipment was brought under the open general licence to make it easy for procurement. The manufacture of such equipment through technology transfer was also encouraged.
- **Electronic Toll Collection (ETC):** The average daily ETC during 2021-22 was Rs 90 crore through 55 lakh transactions. This technology must further evolve, like in developed countries, to the point where vehicles need not slow down for the electronic payment but can have it done while travelling at the maximum speed.

Challenges

- **Better Focus on Safety:** There is rarely a buffer lane for a right turn to enable traffic to wait for the opposing traffic. Crash barriers need improvement and immediate replacement when damaged. Roads for traffic diversion during construction are of poor quality, leading to congestion due to low speeds. Signages are not provided with scientific considerations of visibility to prepare the road user for a change in rhythm of their driving speed.
- **Urban Roads:** urban roads are not getting their due. This results in low speeds in urban areas, leading to significant wastage of time and poor first/last mile connectivity. Further, urban goods movement is treated poorly. Parking is a significant issue.
- **Lane Kilometres versus Road Kilometres:** As more and more multiple-lane roads get constructed, it is important to focus on the measure of lane kilometres rather than road kilometres. This will capture not only access but also capacity.
- **Better Co-ordination with PPP Players:** Significant time and energy is wasted in disputes between the PPP players and the authority. Projects get delayed, leading to significant user inconvenience.

RAIL INFRASTRUCTURE

- The Indian Railways have been a great integrating force for more than 167 years.
- From a very modest beginning in 1853, when the first train steamed off from Mumbai to Thane, a distance of 34 kms, Indian Railways have grown into a vast network of 7,308 stations spread over a route length of 68,043 km.

Rail Infra

- **Central Public Sector Enterprises** - There are 12 Central Public Sector Enterprises under the administrative control of the Ministry of Railways.
- **Research & Development** - The Research Design and Standards Organisation (RDSO) at Lucknow is the R&D wing of Indian Railways. Recently, RDSO successfully conducted Balancing Speed and controllability trials of

Vande Bharat Express. RDSO and IIT, Kharagpur has indigenously developed automation tool (**SigDATE**) for the generation of route control chart for Electronic Interlocking systems.

- **Railway Finance** - The Railway Budget was being presented separately to Parliament since 1924-25 owing to the Separation Convention of 1924. The main reason behind the Separation Convention was to secure stability for civil estimates, as railway finance used to be a sizeable part of the general finances.
 - The Government decided to merge the Railway Budget with the general Budget from the Budget Year 2017-18.
 - The unified budget brings the affairs of the Railways to centre stage and presents a holistic picture of the financial position of the Government.
 - This merger would facilitate multimodal transport planning between Highways, Railways and Waterways.
- **Railway Electrification** - Indian Railways' Mission 100% Electrification policy is seen as pivotal for the country's entire energy sector. The Government initially stepped up the rate of railway electrification in order to **reduce crude oil imports and save foreign exchange payments**.
 - However, there has been growing recognition that it will deliver significant environmental benefits. The higher power of electric locomotives increases the average speeds and loadings for both freight and passenger trains.
- **Rail Tourism** - The IR have introduced theme-based Tourist Circuit Trains under the **Bharat Gaurav Trains Policy** with an objective to showcase India's rich cultural heritage and magnificent historical places to the people of India and the world through professionals of the tourism sector and other potential service providers.
 - Under the said policy, the State Governments, State Tourism Development Corporations or any other potential service provider may run theme-based tourist circuit trains covering any destinations of their choice.

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

NATIONAL RAIL PLAN

- Indian Railways has prepared a **National Rail Plan (NRP) for India - 2030**. The plan is to create a 'future-ready' railway system by 2030.
- **Vision:** To develop capacity and infrastructure and enhance rail freight share ahead of demand. Develop capacity by 2030 that will cater to growing demand up to 2050.
- The key objectives of the National Rail Plan are:
 - To increase the modal share of the railways in freight to 45%.
 - Reduce transit time of freight substantially by increasing the average speed of freight trains to 50 kmph.
 - As part of the National Rail Plan, Vision 2024 has been launched for the accelerated implementation of certain critical projects by 2024, such as 100% electrification, multi-tracking of congested routes, etc.

- Identify new Dedicated Freight Corridors.
- Identify new High Speed Rail Corridors.
- Assess the locomotive requirement to meet twin objectives of 100% electrification (Green Energy) and increasing freight modal share.

VANDE BHARAT EXPRESS TRAINS

- As an excellent example of the 'Make in India' success story, the Indian Railways launched India's first indigenous semi-high-speed train, **Vande Bharat Express**.
- The first Vande Bharat Express train was flagged off on 15 February 2019, on the New Delhi-Kanpur-Allahabad-Varanasi route.
- This train is India's first semi-high-speed train equipped with world-class passenger amenities. It can achieve high speeds due to faster acceleration. & deceleration and will reduce journey time by 25% to 45%.
- As of 28 July 2023, 50 Vande Bharat train services are running on the Indian Railways.

INDIA'S G20 PRESIDENCY

- The 18th G20 Summit held in New Delhi was a clear indicator of Bharat turning over a new leaf in its long history of international relations. The theme of the G20 summit was "Vasudhaiva Kutumbakam".
- From announcing an **international corridor**, which resuscitates the revered Spice Route of old times, to bringing focus back on sustainable development through the **Global Biofuel Alliance**, leaders across the globe have applauded India's approach of diplomacy, non-alignment, and growth for all.
- **Global Biofuels Alliance (GBA)** - 19 countries have joined GBA, along with 12 international organisations.
 - GBA will also help accelerate India's existing biofuels programs such as PM JI-VAN Yojana, SATAT & GOBARdhan scheme increasing farmers' income, creating jobs and enhancing overall development.
 - 20% Ethanol blending, or E20, is estimated to save around Rs. 30 thousand crore annually.
- **G21: Addition of the African Union (AU)** - AU became a permanent member of G20 under the presidency of India.
- **India-Middle East-EU Corridor (IMEC)**: Route of shown in the fig.): India's bilateral trade with countries along the route:
 - **UAE** - \$76.9 billion worth of bilateral trade between May 2022 & March 2023
 - **Jordan** - \$4.4 billion worth of bilateral trade, an increase of 63% over the preceding year
 - **Israel** - Bilateral trade worth over \$10 billion, excluding defence in 2022-23
 - **EU** - \$116 billion worth of trade in goods in 2021-22, accounts for 10.8% of India's total trade
 - **Saudi Arabia** - \$42.8 billion worth of bilateral trade in FY 2021-22.

**New India's mantra: Reform, Perform and Transform****Encapsulating the transformation of Vikasit Bharat in the 77th Independence Day Speech**

- Rs 20 lakh crore in loans disbursed under MUDRA Yojana and 8 crore new entrepreneurs.

- Savings of Rs. 20,000 crore with low cost, high quality medicines under Jan Aushadhi Kendras.
- Ease of Doing Business enables India to become the 3 Largest Startup Ecosystem of the world.
- Honouring our Bravehearts with One Rank One Pension by providing Rs. 70,000 crore to soldiers.
- 13.5 crore people lifted from Poverty (in just 5 years) who entered the neo-middle class.
- Central Government devolution to State Governments increased from Rs. 30 lakh crore to Rs. 100 lakh crore, indicating government's commitment towards **co-operative federalism**.
- Over 4 Crore houses sanctioned under PM Awas Yojana Spending on affordable housing increased from Rs. 90,000 crore to Rs. 4 lakh crore.
- Local development spends increased from Rs. 70,000 crore to Rs. 3 lakh crore.
- Rs. 2 lakh crore spent for tap water connections under Har Ghar Jal of the Jal Jeevan Mission.

Resolution of 77th Independence Days

- Interest subsidy on bank loans for urban poor living in urban slums, chawls, rented houses, unauthorised colonies.
- The Government has announced to increase the number of Jan Aushadhi Kendras from 10,000 to 25,000 for sale of medicine at reasonable prices benefiting the poor.
- Government announced to provide skill development to 2 crore women from rural areas to encourage them for starting micro-enterprises under '**Lakshmi Didi**'.
- Government has announced 15,000 women Self-Help Groups (SHGs) would get agri-drones.
- Vishwakarma Yojana, financial outlay of Rs. 13,000 crore where 18 Traditional trades to be covered in 1st instance.

UNITY MALLS

- Unity Malls - a unique initiative of the Government of India, is poised to play pivotal roles in fostering economic development, providing citizens with recreational spaces, enhancing tourism, and celebrating the rich cultural heritage of our diverse and unique nation.
- The Unity Malls will serve as comprehensive marketplaces within the States, specifically curated for One District One Product (ODOP), products bearing a Geographical Indicator (GI) tag, and locally-crafted handloom and handicraft items.

Unity Mall in Budget Speech

- In her Budget Speech for fiscal year 2023-24, the Union Finance Minister unveiled a remarkable initiative-the establishment of a 'Unity-Mall' in each State of the country.
- These malls are envisioned to be strategically located, preferably in the respective State capitals.
 - However, States have been granted the autonomy to select either their financial capital or one of their prominent tourism centres as the site for this project.
- The **Department of Expenditure in the Ministry of Finance**, has issued comprehensive guidelines to States regarding the construction of Unity Malls.

Purpose Behind the Unity Mall

- It is an integral component of the Union Government's commitment to advancing infrastructure development throughout the country and stimulating capital investment within the States.

- It is designed to foster national unity, expedite progress towards the 'Make in India' and 'Atmanirbhar Bharat' initiatives.
- It will offer local artisans opportunities to showcase and sell their products, create employment opportunities, facilitate skill development, champion local cuisine, celebrate cultural heritage, bolster tourism, and ultimately contribute to overall economic prosperity.

ODOP Initiative

- The ODOP initiative aims to invigorate local manufacturing, create job prospects, mitigate economic disparities, and **stimulate equitable regional growth across every district in India**.
- As part of this endeavour, a distinctive product with unique qualities and cultural significance is carefully chosen, branded, and actively promoted.
- To date, more than 1100 products have been identified and championed through this initiative nationwide.

Geographical Indication (GI)

- A Geographical Indication (GI) signifies the specific country or place of origin for a product.
- Generally, a GI tag provides assurance of the product's quality and unique characteristics associated with its origin in a well-defined geographical area, region, or country.

Scheme for Special Assistance to States

- The Scheme for Special Assistance to States for Capital Expenditure was originally introduced during the fiscal year 2020-21. It was launched to stimulate capital expenditures by State governments, recognising their resource limitations due to the impact of the Covid-19 pandemic.
- The scheme's primary objectives include **harnessing the significant multiplier effect of capital expenditure**, bolstering the future productive capacity of the of the economy, and fostering a higher rate of economic growth.
- Under this scheme, States receive funds in the form of an interest-free loan that is to be repaid after 50 years.
- Importantly, **these loans do not count towards the annual borrowing ceiling of the States**.
- The Scheme for Special Assistance to States for Capital Investment 2023-24 encompasses multiple components and has a total financial allocation of Rs 1.3 lakh crore.
- Notably, a substantial sum of Rs 5,000 crore has been specifically earmarked to extend financial support to States for the construction of Unity Malls.
 - This amount has been allocated to States based on the number of districts. \
 - States are to provide land for the malls free of cost and may also allocate additional funds for the project from their budget.

AGRI INFRASTRUCTURE

- India has graduated from a food-deficit, foodgrain-importing country in 1950s & 1960s to a surplus-generating and leading exporting country, particularly in case of rice and wheat.
- Today, India is one of the largest producers of many agricultural commodities in the world, such as cereals, fruits, vegetables, spices, sugarcane and cotton.

Food Security During Covid-19

- The Covid-19 pandemic during 2020- 2021 brought challenges to food security for millions of people world-wide due to supply-chain disruptions and affordability.

- To address this challenge, under the **Pradhan Mantri Garib Kalyan Ann Yojana (PMGKAY)**, the Govt doubled the food entitlement from 5 kg per person per month to 10 kg per person per month to 80 crore people who are covered under the National Food Security Act (NFSA) - from April 2020 to December 2022.
- India also exported 19.83 million metric tonnes of rice per year on average during the 2020- 21 to 2022-23 period.
- This shows India's capacity today not only to meet the food requirements of its own population but also to contribute substantially to world food security.

Agri Production During Early Years

- In the 1950s and 1960s, food shortages and deficits were then a great concern, which impacted the food security of India.
- With a **continuous drought** for three years, from 1964 to 1966, the import of wheat reached its highest level of 7.78 million metric tonnes in 1966.
- This also included wheat imported under PL480 from the United States of America. This was even popularly called a '**ship-to-mouth**' situation.
- At this juncture, India started 'Green Revolution, through the introduction of high-yielding varieties of wheat and rice.
- With this increased production of cereals, India's import of wheat started declining, and it approached its floor from the mid-1980s onwards, except for a few years.
- India started exporting rice, particularly from the year 2000 onwards, and **became the top exporter in recent years, enjoying around a 40% share of global rice exports.**

Trends in Agricultural Production

- **Food grain production** - The overall food grain production (cereals plus pulses) rose from 51 MT in 1950-51 to over 330 MT in 2022-23.
- **Millet cultivation** - The Govt has given new impetus to millet cultivation. On India's proposal, the United Nations has declared the year 2023 the 'International Year of Millets.
- **Pulse production** - India is the largest producer and consumer of pulses. As pulses production has not increased in step with the population growth, per capita availability has declined from 22.1 kg per person in 1951 to 16.4 kg per person in 2022.
 - To attain self-sufficiency, the Govt continues to adopt various measures to incentivise pulses production under **National Food Security Mission, Minimum Support Price programmes**, and by increasing procurement.
- **Edible oil** - India is dependent on edible oil imports to meet its domestic demand. The import dependency in FY 2022-23 was around 55% of the total requirement.
 - The govt implemented the **Technology Mission on Oilseeds** in 1986 to increase domestic production. As a result, the dependence had declined to just 2% in 1993-94.

	Area (Million Hectares)			Production (Million tonnes)		
	1950-51	2022-23*	Times Increases	1950-51	2022-23*	Times Increases
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/Millet	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

- However, the WTO agreement in 1995 put the edible oils under the Open General Licence, which led to a jump in cheap imports.
- Prolonged cheap imports reduced domestic oilseed prices below MSP and lessened incentives for farmers to grow oilseeds. Sunflower has gone almost out of domestic production.
- To make the country Atmanirbhar in edible oils, domestic oilseed production is being promoted under the scheme **National Food Security Mission-Oilseeds** (NFSM-OS) from 2018-19.
- Further, the **National Mission on Edible Oil - Oil Palm** (NMEO-OP) has been launched in 2021- 22 to promote oil palm cultivation.
- The mission has a target of increasing the area under palm oil cultivation from 3.70 lakh hectares in 2021-22 to 10.00 lakh hectares in 2025-26.
- **Fruits and vegetables** - Production of fruits and vegetables has increased to 320 million tonnes in 2022-23. There is a major shift towards consumption of fruits and vegetables due to rising per capita income.
 - However, perishability, seasonality, and price volatility pose challenges. Therefore, there is a need for enabling infrastructure, such as processing centres and cold chains, to reduce wastage and maintain regular supply at a reasonable price.
 - The **National Agriculture Infra Financing Facility** of Rs 1 lakh crore, announced in the year 2020, is a welcome initiative to address the agricultural infrastructure issues holistically.
- **Cotton** - India is a leading producer of cotton and sugarcane. Adoption of Bt cotton in 2000s enabled significant increase in cotton production - from 100 lakh bales in 2001-02 to 343 lakh bales in 2022-23.
 - However, development of resistance in pests such as Pink Boll Worm, to Bt cotton, has posed a challenge to the sustenance of cotton production.
- **Sugarcane** - India is the second largest producer of sugarcane and the largest consumer of sugar in the world. **The Government's ethanol-blending programme** and recent initiative of direct conversion of sugar juice to ethanol may ensure adequate price recovery and timely payment to farmers.
 - Sugarcane production fluctuates mainly because of deficit monsoon and because mills, not being able to generate sufficient revenue owing to depressed prices, defer payment to farmers.
 - As a water- intensive crop, its cultivation in semi-arid regions, particularly in Maharashtra, Karnataka and Tamil Nadu, leads to groundwater depletions. Further, lack of mechanisation, particularly for harvesting, is another challenge.

Agricultural Resources and Inputs

- **Net sown area** - The net area sown for crops in 2019-20 was 139.90 million hectares. Also, the net irrigated area, as a percentage of net sown area, has gone up to 53.39 in 2019-20.
- **Use of fertilisers** - Application of fertilisers (Nitrogenous, Phosphatic, and Potassic, or NPK) has increased to 140 kg per ha in 2019-20.
 - Fertiliser subsidies by the Govt have incentivised farmers to apply larger amounts of fertilisers. The recommended ratio of fertiliser application (N:P:K) is 3:2:1. However, farmers apply more nitrogenous fertilisers than the ratio warrants.
 - To incentivise farmers to go for application of fertilisers more in keeping with recommended proportions, a **nutrient- based subsidy scheme** was introduced in 2010 and further revised in May 2023.
 - **Neem-coated urea** was introduced to reduce wastage and diversion of the subsidised product to non-agricultural sectors.
 - Further, the **Soil Health Card** will help farmers apply the required quantity of fertilisers.

- The Government is also encouraging farmers to use **nano urea** for a more sustainable and judicious application of fertilisers.
- **Irrigation** - Programmes such as the **Command Area Development Programme** (started in 1974-75) and the **Accelerated Irrigation Benefit Programme** (1997) have played a great role in providing water to the parched fields of India.
 - As per the 2010 census, groundwater irrigation has a share of 63% in total irrigation in terms of area. overexploitation has an adverse impact on sustainability, particularly in the case of water-intensive crops like paddy and sugarcane.
 - To promote more sustainable and judicious use of water for irrigation, the govt is implementing a drip and sprinkler irrigation programme called '**More Crop Per Drop**' under the **Pradhan Mantri Krishi Sinchayee Yojana** from 2015-16.
 - Further, crop diversification is also being promoted.

Price Policy, Market And Other Support

- The Government of India fixes **Minimum Support Prices** (MSP) for 23 commodities each year, before the sowing season. Pulses and Oilseeds are also being procured at MSP under the Price Support Scheme.
- With the availability of IT technology, the **National Agricultural Market (e-NAM)** was launched in 2016. e-NAM is a digital platform integrating 1260 APMC mandis across 22 States and 3 UTs to facilitate online trading of 203 agricultural and horticultural commodities.
 - This enables farmers to realise more remunerative prices for their produce.
- **Digital Public Infrastructure** (i.e., **AgriStack and Krishi Decision Support System**) is being built by using space technology and other modern technologies, such as Artificial Intelligence and Machine Learning, to provide inclusive and farmer-centric solutions.
 - This will help farmers and other stakeholders in the areas of crop planning and health, improved access to farm inputs, credit and insurance, crop estimation, market intelligence, and support for the growth of Agri-Tech industry and startups.
- To address the challenges posed by climate change, the Govt has been implementing schemes such as the **National Mission for Sustainable Agriculture** (NMSA) and **National Innovations in Climate Resilient Agriculture** (NICRA) to cope with biotic and abiotic stress.

G20: GLOBAL STARTUP ECOSYSTEM

- The G20, is a group of 19 countries and the European Union that represents almost two-thirds of the global population, 75% of global trade, and 85% of the world's GDP.
- The G20's constitution is not a formal document but a set of principles and practices that guide its functioning.
- The governance of the G20 is based on the principle of rotating presidencies, with each member country assuming the presidency for a year.

India's G20 Presidency

- India's G20 presidency is themed on '**वसुधैव कुटुम्बकम्**' or 'One Earth One Family One Future'. This theme reflects the constitutional values of unity, fraternity, and harmony and highlights the **LIFE (Lifestyle for Environment) initiative**.
- The Indian presidency also made significant strides in accelerating progress on the Sustainable Development Goals (SDGs).

- The G20 countries reaffirmed their commitment to achieving the targets set out in the 2030 Agenda for Sustainable Development, with a particular focus on addressing the impact of the Covid-19 pandemic.
- In the realm of technology and digital infrastructure, India promoted a human-centric approach to technology and increased knowledge sharing in areas such as digital public infrastructure, financial inclusion, and tech-enabled development in sectors such as agriculture and education.

Governance Mechanism and Working Groups

- India holds the G20 presidency for the year 2023, starting from 1 December 2022 and ending on 30 November 2023.
- To ensure the annual presidency a rotating chair of three-member 'troika' of the past, current, and next year's chairs is formed.
 - The current troika is formed by Indonesia - India - completion of the Indian Presidency, the G20 baton Brazil.
 - After the goes to Brazil, forming a new Troika of India - Brazil - South Africa.
- To take forward the presidency, a series of over 200 events were held across India, leading up to "The Leaders' Summit" in September 2023.
- These events were designed to strengthen India's agenda and the **six thematic priorities of its G20 presidency**:
 - Green Development, Climate Finance & LIFE;
 - Accelerated, Inclusive & Resilient Growth;
 - Accelerating Progress on SDGs;
 - Technological Transformation and Digital Public Infrastructure;
 - Multilateral Institutions for the 21st century; and Women Empowerment.
- The Finance Track of G20 focused on issues related to global economic growth, international financial architecture, financial regulation, and international tax matters.
- The Sherpa Track under focused Working Groups played a crucial role in advancing its agenda in key areas such as finance, trade and investment, agriculture, anti-corruption, health, tourism, and women empowerment etc.
- Currently, the official engagement groups are- Business20, Civil20, Labour20, Parliament20, Science20, Startup20, Think20, Urban20, SA120, Women20, and Youth20.
 - Business20 is the oldest engagement group and **Startup20 is the newest.**

Startup20 Engagement Group

- Startup20 is the newest Engagement Group initiated under the Indian G20 Presidency.
- It aims to harmonise the global startup ecosystem and collaborate across diverse sectors of work like education, finance, energy, sustainability, agriculture, and others.
- The deliberations of Startup20 have been organised **under five task forces**, namely Foundation, Alliance, Finance, Inclusion, and Sustainability.
 - **Foundation:** focus on creating and adopting consensus-based definitions and terminology to strengthen the startup ecosystems within and across G20 nations.
 - **Alliances:** for scaling up businesses in domestic as well as international markets.
 - **Finance:** to focus on policies and frameworks to facilitate a favourable policy environment for startup financing.

- India, under the **Startup20 Policy Communique** has urged the G20 Nations to Raise the joint annual investment of G20 nations in the global startup ecosystem to US\$ 1 trillion by 2030.
- **Inclusiveness:** foster a culture of inclusivity and diversity in the global startup ecosystem and support those startups that prioritise inclusion.
- **Sustainability:** to accelerate startups that address significant SDG gaps in areas of common interest to all other countries or represent groups whose inclusion requires special attention (for example, women entrepreneurs and people with disabilities).

Significance

- The global startup industry, currently valued at around \$3 trillion in a \$90 trillion world economy, is experiencing rapid growth and disruption.
- India has emerged as the **world's third-largest startup ecosystem**. By initiating Startup20 during its G20 Presidency, India seeks to position itself as a '**Global hub for Startups**'.
- Apart from the policy document, the deliberations of Startup20 also focused on:
 - creating a **Startup Handbook** of common agreed-upon definitions and terminologies about startups ecosystem;
 - and a **Global Innovation Centre**, which will foster collaborations across the borders of G20 Nations.
- G20 countries will also work towards promoting **Startup20 as a Global Point of Contact for startup ecosystems**.

Outcome

- The Startup20 Engagement Group has come up with **five major action points** to build the Global Startup Ecosystem with the joint efforts of G20 countries, which are aligned with the five task forces:
 - **Action 1:** Create and adopt a global startup definition framework.
 - **Action 2:** Increase, diversify, and ease access to global capital, markets, mentors, and talent for startups.
 - **Action 3:** Emphasise the inclusion of under- represented groups and communities in startup ecosystems.
 - **Action 4:** Cultivate mechanisms to identify and scale startups of global interest.
 - **Action 5:** Establish a networked institution across G20 nations.

Conclusion

- Though the G20 was established as a crisis management committee for a struggling world economy, the group has managed to become a premier forum that serves economic growth and global stability.
- Individual tracks and Engagement groups deliberate on their defined objectives and give outcome-based recommendations.
- Each presidency stirs up different narratives. The Indian Presidency of the Group of Twenty will encourage conversations of collaboration and consensus focused on actions and decisions.

PM GATISHAKTI NATIONAL MASTER PLAN

- To achieve Atmanirbharta and a US \$5 trillion economy by 2025, there was a need to create multimodal and last-mile connectivity infrastructure across the country.
- This would ensure a modal mix of transportation, reduced logistics cost, increased export competitiveness, and a cycle of higher investments, growth, and employment generation in the economy.

PM GatiShakti

- Launched in October 2021, PM GatiShakti adopts a whole of the government approach and cooperative federalism to transform India's infrastructural landscape.
- Its objective is to improve multimodal connectivity, and logistics efficiency and address critical infrastructure gaps for the seamless movement of people, goods, and services in the country.

Working

- PM GatiShakti brings together 27 Central Government Ministries under a single institutional framework.
- An **Empowered Group of Secretaries** (EGOS) under the Chairmanship of the Cabinet Secretary has been constituted to oversee the implementation of PM GatiShakti.
- It is the apex body with 23 infrastructure and user ministries of the Government of India.
- An integrated **multimodal Network Planning Group** (NPG) has been operationalised with representation from 8 various infrastructure Ministries involving heads of their Network Planning Division.
- Involving every concerned Central Ministries/Departments within a single institutional structure, 81 High Impact Projects, 54 NPG Projects, and 197 Critical Infrastructure Gaps have been identified and evaluated by the institutional mechanism under PM GatiShakti.

Catalysing Infrastructure Planning With Technology

- The PM GatiShakti NMP is a technology-backed infrastructure development platform with GIS- based data layers of infrastructure, geographic features and demography, and various decision support systems.
- Developed by **BISAG-N**, the platform enables integrated planning, synchronised implementation, and project monitoring.
- The platform aims at enhancing industrial productivity and helping the country achieve its green logistics and clean energy goals.
- It does so by enormously boosting the multi-modal connectivity across highways, railways, ports, airports, logistics infrastructure, mass urban transportation, and inland waterways.