



VAJIRAM & RAVI
Institute for IAS Examination

The Analyst

CURRENT AFFAIRS Handout

24th December 2025



Critical Minerals key to National Security



CONTEXT: The Chief of Integrated Defence Staff has raised the issue of geopolitical dimension of mineral supply chains citing that how global supply networks for critical minerals are highly concentrated & increasingly subject to “export controls”

Context of News :

Critical minerals are crucial for national security, defence capability development, and technological sovereignty. Air Marshal Ashutosh Dixit, Chief of Integrated Defence Staff to the Chairman Chiefs of Staff Committee, said on Tuesday.

Speaking at a discussion titled “Minerals that Matter: Geopolitics, Sovereignty and Value Chains”, Air Marshal Dixit underscored the role of critical minerals in modern defence systems. “Modern defence systems, including jet engines, missiles, precision munitions, radars, satellites, batteries and semiconductors, are intrinsically dependent on assured access to these minerals,”

Pillar 1: What is so “Critical” about these Minerals?

Use of Critical Minerals in “Defence Sector” :

Neodymium & Dysprosium	• High strength magnets for motors in Drones, guidance system in missiles & radars
Titanium	• Strong & Lightweight metal for Aircraft, Engines & Armour
Tungsten	• Used in armour piercing projectiles due to its high density
Cobalt, Lithium & Nickel	• Crucial for advanced batteries powering electronics, EVs & Military hardware
Copper	• Essential for wiring, electronics & electromagnetic protection in Ships & Aircrafts
Gallium & Germanium	• Semiconductors for electronic warfare systems

Pillar 1: What is so “Critical” about these Minerals?

Global Critical Minerals Outlook 2024 report

Lithium demand rose by 30% in 2023

Nickel, cobalt, graphite & REE : 8-15% Growth

Aggregate value pegged at \$325 billion

Pillar for “Energy security” & Achieving our “National Goals”

To ensure “Security” & Sovereignty of the Country

The essential minerals for a robust defence ecosystem

India needs to be self-sufficient in the production of critical minerals, metals, and rare earths, to increase indigenous defence production



A red trail is seen in the night sky as India's air defence system intercepts aerial objects during a suspected drone attack from the Pakistan side. Copper, carbon fibre, aluminium, plastic, lithium-ion, and silicon go into a drone. | Photo Credit: IMRAN NISSAR

Critical Minerals key to National Security

CONTEXT: The Chief of Integrated Defence Staff has raised the issue of geopolitical dimension of mineral supply chains citing that how global supply networks for critical minerals are highly concentrated & increasingly subject to “export controls”

Pillar 2: Status of “Self - Sufficiency” in Critical Minerals :

Ministry of Mines Data 2024

Number of Mines : 1319

Metallic : 545

Non - Metallic : 774

India's Mining GDP =
₹82,680 Crore

Employment =
11 Million people

India's Global standing:

Crude Steel	2nd
Aluminium	2nd
Limestone	3rd
Iron Ore	4th
Coal	2nd

Mineral	Importance	Import Dependency
Bismuth	Pharmaceutical and chemicals	85.6%
Lithium	EV batteries and energy storage	82%
Silicon	Semiconductor & solar panels	76%
Titanium	Aerospace & defence applications	50%
Tellurium	Solar power & thermoelectric devices	42%

Pillar 2: Status of “Self - Sufficiency” in Critical Minerals :



Ministry of Mines Report 2023 : 30 essential critical minerals of which complete import dependency for 10 minerals

China : World's Largest mining Nation

Exploration investment :
\$19.4 Billion

87% of Rare earth elements processing

58% of world's lithium refining

68% of Silicon processing

Inadequate exploration & tapping of Reserves : Case study of Ilmenite

Deep seated minerals : High risk investment in exploration & mining

Lack of incentive for Private sector

Case Study : Discovery of 5.9 million tonnes of Lithium Deposit in J & K

Villagers show lithium stones discovered in Reasi district, Jammu and Kashmir. | Photo Credit: PTI



Critical Minerals key to National Security

CONTEXT: The Chief of Integrated Defence Staff has raised the issue of geopolitical dimension of mineral supply chains citing that how global supply networks for critical minerals are highly concentrated & increasingly subject to “export controls”

Pillar 2 : Status of “Self - Sufficiency” in Critical Minerals :

PRELIMS 2025 :

6. Consider the following statements :
- India has joined the Minerals Security Partnership as a member.
 - India is a resource-rich country in all the 30 critical minerals that it has identified.
 - The Parliament in 2023 has amended the Mines and Minerals (Development and Regulation) Act, 1957 empowering the Central Government to exclusively auction mining lease and composite license for certain critical minerals.
- Which of the statements given above are correct?
- (a) I and II only (b) II and III only
(c) I and III only (d) I, II and III

India’s reliance on China for critical minerals | Explained

‘India endowed with 95 minerals, but yet to establish a footprint in critical minerals’

UPSC Examiner creating this Question :



Issue 1 : Trade Deficit :

- July 2025 : India’s Imports : \$113 Billion - India’s Exports : \$14.25 Billion
- Trade Deficit : \$1.1 Billion in 2004 to \$99 billion in 2024
- China’s trade deficit = 35% of India’s total trade imbalance
- Why so serious?

Issue 2 : Creation of “Critical dependence” :

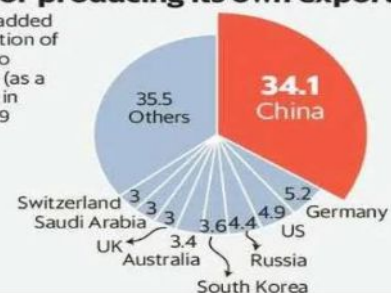
- Antibiotics = 97% supply of Erythromycin
- Electronics = 86% of flat panel displays & 80% of Laptops
- Renewable Energy = 82% of solar cells & 75% of Lithium ion batteries

GTRI : “Overwhelming dominance gives Beijing potential leverage against India turning supply chains into a tool of pressure in times of political tension”

Chart 3a

India depends most on Chinese imports for producing its own exports

Foreign value-added (FVA) contribution of each country to India’s exports (as a % of total FVA in exports) in 2019



Critical Minerals key to National Security

CONTEXT: The Chief of Integrated Defence Staff has raised the issue of geopolitical dimension of mineral supply chains citing that how global supply networks for critical minerals are highly concentrated & increasingly subject to “export controls”

Pillar 3 : What has been India's Response?

Steps taken :

KABIL : To secure overseas Mineral assets

GSI + CSIR = Promotion of Circular Economy

PLI for extraction of Critical Minerals

100% FDI under Automatic route

National Critical Mineral Mission 2024

- Fast track regulatory approval process
- **Financial incentive** to private companies
- Acquire critical mineral assets abroad
- Enhance trade with resource rich countries
- Mineral processing parks
- **Centre for Excellence on Critical Minerals**

Mines & Minerals Act 2023:

- **Private sector = 6 out of 12** atomic minerals
- **Prospective stage exploration** : Allow drilling & subsurface excavation
- **National Mineral Exploration Trust (NMET)** : Funding G4-G1 explorations
- **Under Single License** : Explore area upto **1000 km²**
- **Mine Owners** : Sell **50% of annual mineral** including coal in open market

Pillar 3 : What has been India's Response?

Signed contract with **ISA** in 2016

Deep Ocean Mission for Ocean Exploration

MATSYA 6000 : Autonomous Underwater Vehicles (AUVs)

Samudrayaan Mission = Deployment of MATSYA (deep sea vehicle)

Carlsberg ridge = Mid Ocean ridge system in Indian Ocean

Deposits in ocean floor rich in **copper, zinc, lead, gold & silver**

Six Core Components of Deep Ocean Mission



Manned Submersible (MATSYA 6000)
Depth: 6,000 meters
Carries 3 aquanauts



Deep Sea Mining System
Targets cobalt, nickel, copper



Ocean Climate Advisory Services
Seasonal to decadal forecasts



Biodiversity Exploration
Marine microbes, flora, fauna for pharma & biotech



Ocean Energy & Desalination
OTEC-powered freshwater systems



Survey of Hydrothermal Sulphides
Mapping mid-ocean ridges



Critical Minerals key to National Security



CONTEXT: The Chief of Integrated Defence Staff has raised the issue of geopolitical dimension of mineral supply chains citing that how global supply networks for critical minerals are highly concentrated & increasingly subject to “export controls”

Mains Practise Question

Practise Question : Why Critical minerals are essential for **India's Energy & National Security**? How **“import dependency” on China** for critical minerals impacts Indian economy? What are the **steps taken by Government of India**?
(15 Marks, 250 words)



How Exports are concentrated in "Few" States

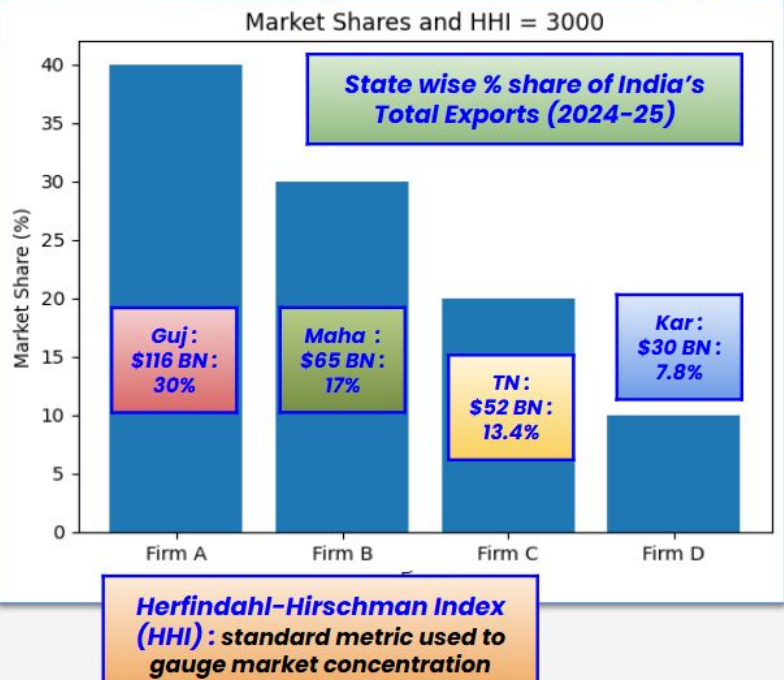


CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in "Regional imbalance" in Export share.

Pillar 1: The "Core - Periphery" Pattern :

Context of News :

Despite a weakening rupee that has put India in the bracket of Asian countries with the worst performing currency, the economy's export numbers look impressive in the aggregate. However, a closer reading of the data reveals a far more uneven and structurally revealing story. When stripped of national aggregates, the data reveals a sharp divergence in performance across regions. A rigorous interrogation of the RBI Handbook of Statistics on Indian States 2024-25 reveals underlying structural dynamics.



Pillar 1: The "Core - Periphery" Pattern :

"India's export economy is heavily centralised"

4 states (G + M + TN + K)
= 70% of all
merchandise exports

Gujarat = 33% of
Merchandise exports

Populous states
(UP + MP + Bihar) =
5% of total exports

8 NE States =
0.13% of total exports



24th December 2025

CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in "Regional imbalance" in Export share.

Export hubs

The data for the maps and the table was sourced from the export import dashboard maintained by the Ministry of Commerce. All the data pertains to the year FY 2022-23 (until January)

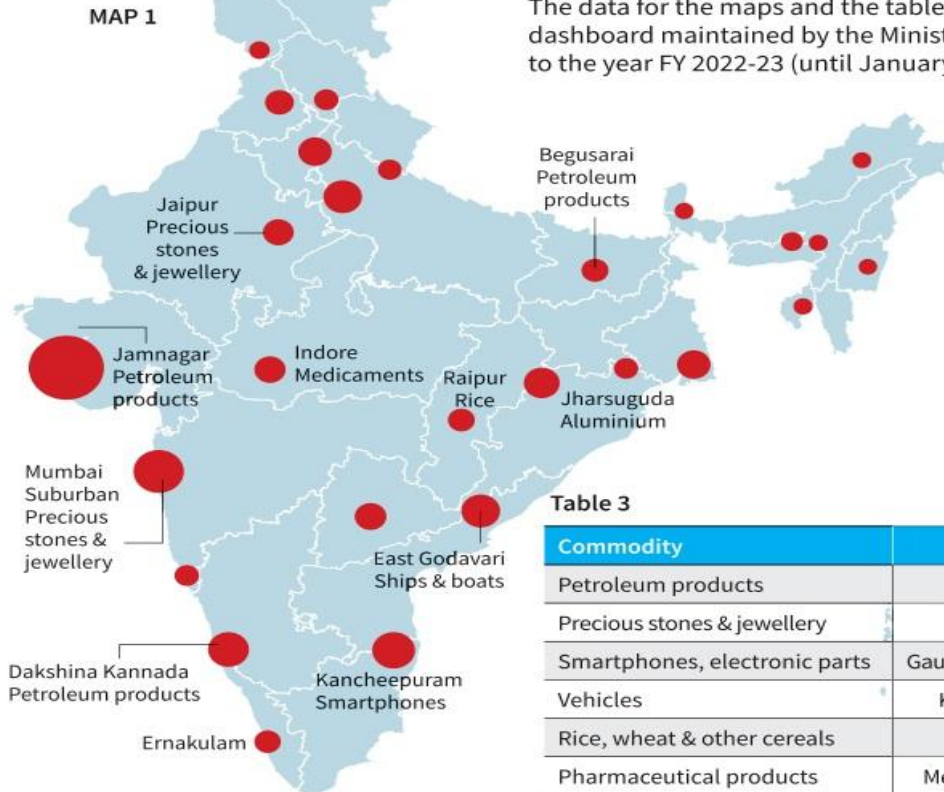


Table 3

Commodity	District	State	Share
Petroleum products	Jamnagar	Gujarat	67%
Precious stones & jewellery	Surat	Gujarat	36%
Smartphones, electronic parts	Gautam Buddha Nagar	Uttar Pradesh	26%
Vehicles	Kancheepuram	Tamil Nadu	21%
Rice, wheat & other cereals	Karnal	Haryana	17%
Pharmaceutical products	Medchal Malkajgiri	Telangana	15%

Petroleum products



Precious stones & jewellery



Rice, wheat and other cereals



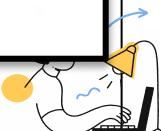
Smartphone and electronics



Vehicles



Pharmaceutical products



How Exports are concentrated in "Few" States

24th December 2025

CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in "Regional imbalance" in Export share.

Pillar 2 : Why **change** in such pattern is Imperative?

Foreign Trade Policy 2023 :

Achieve **\$1 Trillion** in Merchandise Exports & Services Export each by 2030

Increase share in Global Merchandise Trade to 3% by 2027 and **4-5% by 2030**.

Global Hub in "Sunrise sectors": Achieve **\$300 billion** in electronics production by 2025-26

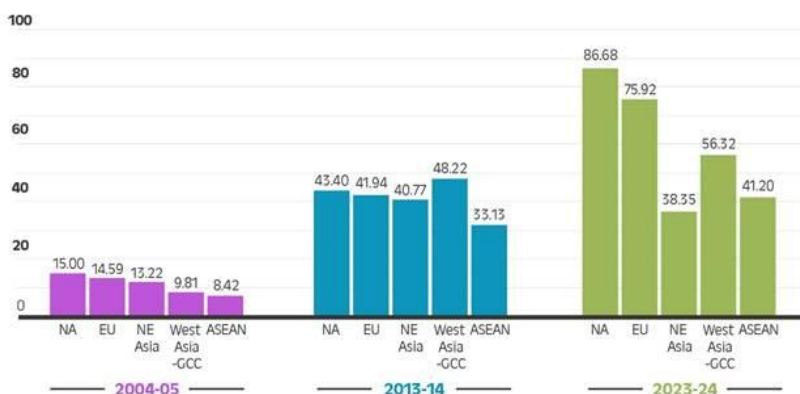
Become leading exporter of **Green Hydrogen, solar modules & electric vehicle**

Integration of **MSMEs** into Global Value Chain

"National average masks a deepening regional crisis"

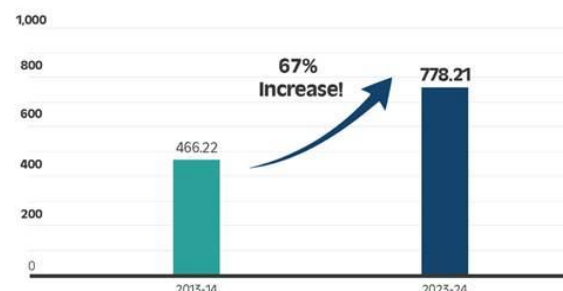
Top 5 Regions for India's Exports Over the Years

(In USD Billion)



India's Export Growth Over the Years

(In USD Billion)



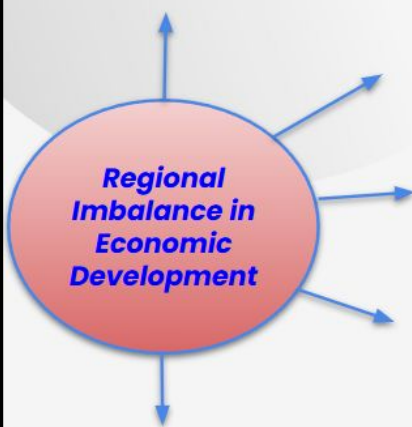
24th December 2025

CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in "Regional imbalance" in Export share.

Pillar 2 : Why **change** in such pattern is Imperative?

"Push" workers out of Backward & Resources deprived region

NSSO 78th Round Data :



Rural - Urban & Regional Wage & Infrastructure disparities

Proliferation of Slums, traffic congestion, rising pollution & concretisation of "tipping point" cities

"Wage depression" due to Labour surplus

Proliferation of "Son of Soil" Syndrome & Regionalism

Migrated to	Migrated from	% of external migrants
Maharashtra	Uttar Pradesh	3.7
Kerala	Gulf countries	2.6
Delhi	Uttar Pradesh	2.5
West Bengal	Bihar	2.4
Jharkhand	Bihar	2.2
Uttar Pradesh	Bihar	1.6
Uttar Pradesh	Delhi	1.6
Punjab	Uttar Pradesh	1.5

Pillar 3 : Why this **"divergence is accelerating?"**

Shifting from volume to value :

Lack of Localisation & Complexity of Value Chain :

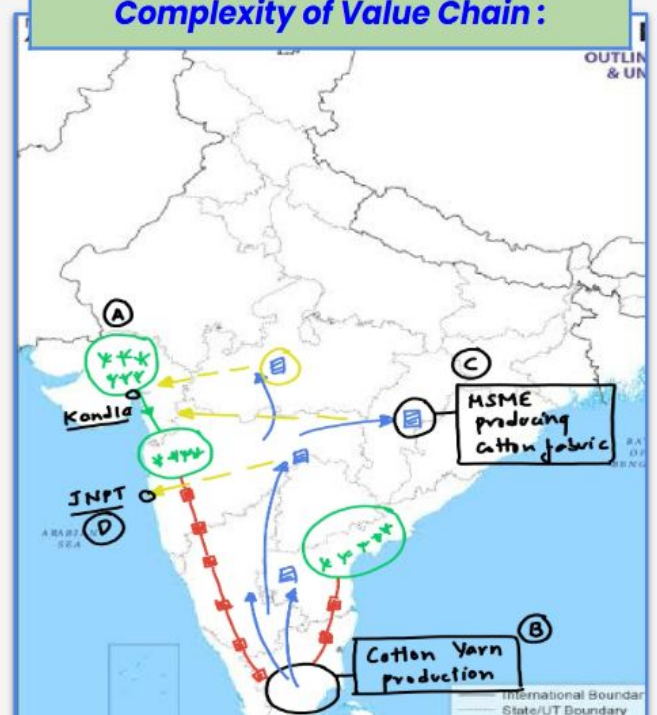
Window for **low-skill & labour-intensive** industrialisation is closing

WTO : Structural slowing of merchandise trade volume growth to a band of **0.5-3%**

UNCTAD 2023 report : Top 10 global exporters control **55%** of world merchandise trade

Economic complexity = more diverse & tightly connected export baskets for **"High Value"** Production

Sparsely connected peripheral areas face steep barriers to **structural upgrading**



How Exports are concentrated in "Few" States



CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in "Regional imbalance" in Export share.

Pillar 3 : Why this "divergence is accelerating?"

01

Annual Survey of Industries (ASI) 2022-23 : Fixed Capital (10.6%) v. employment (7.4%)

02

Factory floor is becoming more expensive and less labour absorptive

Capital over the worker

03

Fixed capital per person engaged has risen to 23.6 lakh

04

We are exporting value rather than volume of employment

"Worker is becoming less central to the production process"

- India Skills Report 2024 : **54% Graduates are Unemployable**
- 60-70% skill gap** in ML Engineer, Data Scientist etc
- Nominal GVA = Primary sector = 14% + **Secondary sector = 26%** + Tertiary sector = 60% (Q2, 2025)
- PLI-driven surge in electronics exports (47% last year) = locked in **Kancheepuram or Noida**
- "GFCF Growth is due to High Govt CAPEX": Unsustainable due to High Fiscal Deficit

Pillar 4 : What are the Steps Taken?

Initiatives by the Government :

Kaushal Vikas Yojana

Employment Linked Incentive Scheme

PLI Scheme : Silk Cluster in Bhagalpur + Handloom in Gaya

Creation of Infrastructure in Backward districts under ADP

North East Special Infrastructure Development Scheme (NESIDS)

To cut imports, govt. to pick 100 items for local manufacture

The Centre's move is aimed at encouraging private sector to expand its capacity so as to substitute imports with domestic production

UP LEADS THE AI REVOLUTION: FARMING, GOVERNANCE & CULTURE GO DIGITAL

UP Global Pilot for AI in Agriculture

Under a World Bank, Google partnership, Uttar Pradesh became the world's first pilot site where AI transformed outcomes for smallholder farmers.

AI IN AGRICULTURE
Boosting small farmer's productivity

SMART CITIES & ICCCS
Enhancing urban governance

AI IN HEALTH & MAHAKUMBH-2025
Empowering care and events in UP

AI Across UP



Transforming Lives with Technology

- Real-time crowd management
- Khoya-Paya Centre reunites missing persons in minutes
- AI-driven emergency response systems
- AI-powered diagnostics & robotic surgeries

"Uttar Pradesh is blending ancient heritage with future-ready innovation"

- Yogi Adityanath, Chief Minister, U.P.

How Exports are concentrated in “Few” States

24th December 2025

CONTEXT: The article highlights that how the development theory that assumed export expansion would serve as the primary bridge from agriculture to mass industrial employment stands contradicted showcased in “Regional imbalance” in Export share.

Mains Practise Question

Question : “Discuss the major causes of **regional imbalance in development** and evaluate the effectiveness of government initiatives aimed at achieving balanced regional growth.”

(10 Marks, 150 words)



India's "MMR" Declined significantly

SYLLABUS : GS 2 Paper : Government Policies & Interventions
Newspaper The Hindu Page Number : 12

India's "MMR" Declined significantly

Context of News :

"The rate of institutional deliveries in the country has increased to 89%, which led to a significant reduction in the MMR. The Narendra Modi government is striving through its healthcare services to ensure that citizens remain healthy and do not fall ill in the first place," Mr. Nadda said.

01

NFHS - 5 (2021-23) : 57% women (15-49 years) are Anemic

02

India's Maternal Mortality Ratio (MMR) = 93 per 1,00,000 women

03

State with Highest MMR = Madhya Pradesh (175)

WHO Report 2024 : One maternal death occurred almost every 2 minutes in 2023

India's "MMR" Declined significantly

Poor status of Health Infrastructure

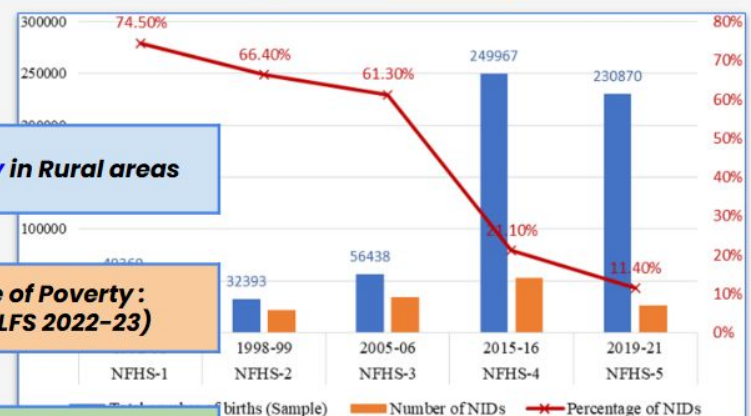
Causes of Prevailing High MMR

Medical illiteracy in Rural areas

Vicious cycle of Poverty : FLFPR : 41% (PLFS 2022-23)

75% Pregnant & lactating mothers have insufficient Calorie & Protein Intake

Issue of "Child Brides"



SYLLABUS : GS 2 Paper : Government Policies & Interventions
Newspaper The Hindu Page Number : 12

India's "MMR" Declined significantly

Steps take by MoHFW :

Janani Suraksha Yojana

- **PHC + Private = ₹1400 (Urban) & ₹1000 (Rural)**
- **SC/ST Women = Low & High Performing state**
- **BPL Households = High Performing State**
- **Only above 19 years**
- **Only upto 2 Live Births**

Matru Vandana Yojana

- **Maternity benefit to pregnant & lactating women**
- **₹5000 = 3 Installments**
- **₹1000 = Registration**
- **₹2000 = 6 Months & Antenatal checkup**
- **₹2000 = Immunisation of Child**



PROTECTING MOTHERHOOD THROUGH JANANI SURAKSHA YOJANA AND JANANI SHISHU SURAKSHA KARYAKRAM



Integrates cash assistance with delivery and post-delivery care

Over **25,000** 'Delivery Points' strengthened for RMNCH+A services

Over **102 free transport services** operationalised for pregnant women

Institutional births



*Institutional Births are the deliveries occurring in healthcare facilities

*RMNCH+A - Reproductive, Maternal, Newborn Child plus Adolescent Health

Data as of 2021-22
Source - CoI

India's "MMR" Declined significantly

Reproductive & Child Health Portal

Surakshit Matritva Ashwasan (SUMAN)

PM - Surakshit Matritva Abhiyaan

LaQshya Initiative

Steps taken for Women Healthcare

Anemia Mukh Bharat Abhiyaan

MDSR Portal

Way Forward : Bijoya Chakravarty 2018

- **Expand the efficiency of Insurance & Digital healthcare to Tier 2 & Tier 3 cities**
- **Robust Primary & Secondary Healthcare**
- **Reduce curative care load at Tertiary Level**
- **Telemedicine with use of AI**
- **Finland's Health education model**

"Dehorning" of Rhino

SYLLABUS : Prelims : Important Fauna in the News
Newspaper The Hindu **Page Number** : SCIENCE

Dehorning of Rhinos

Context of News :

Once upon a time, the thunder of the hooves of lakhs of mighty rhinoceroses echoed across the savannahs, grasslands, and tropical forests of Africa and Asia – but things have gotten pretty quiet lately. As of 2024, fewer than 28,000 rhinos remain on the planet, all five species combined.

One approach that has shown promise is dehorning. An international team of researchers recently collected data over seven years from 11 reserves in the South African portion of the Greater Kruger region and found that dehorning significantly reduced poaching incidents by removing the primary incentive for poachers.

Greater Kruger Region :

- Large integrated wildlife conservation landscape
- Includes : **Kruger NP** (South Africa) & **Limpopo NP** (Mozambique)
- Shares boundary with : **Okavango Delta** (Botswana) & **Maasai Mara** (Kenya)
- Home to **Big - 5** : Lion + Leopard + Elephant + Buffalo + **Rhino**
- Private Game reserves : **Sabi sands** + **Timbavati** + **Thornybush**

THE GIST

Greater Kruger lost 1,985 rhinos between 2017 and 2023. That was despite millions invested in anti-poaching strategies, including patrols, dogs, AI-powered cameras, and aerial surveillance. Now, one approach is showing promise — dehorning

Some perceive rhino horns as status symbols. They are also used in traditional medicine because it is believed that it treats everything from fever and gout to more mystical issues like possession. One report found that horns generated between \$874 million and \$1.13 billion in illicit income

India and Nepal, however, have chosen not to dehorn, because their local programmes have been successful. They have lost only one or two rhinos over the last three years. Kaziranga's success has been attributed to smart patrolling and community engagement



24th December 2025

"Dehorning" of Rhino

SYLLABUS: Prelims : Important Fauna in the News
Newspaper The Hindu **Page Number** : SCIENCE

Obsession with Rhino's Horns :

- Made of **Keratin** : Fibrous protein found in hair & nails
- Used by practitioners of traditional medicine : **China & Vietnam**
- "Status symbols" for Elites
- Wildlife Justice Commission Report 2022 : 2012-2022 : **\$1.13 Billion** of Gross Illicit Income

Dehorning against Poaching :

- "Poverty in local communities creates financial pressures"
- **Bayesian Regression Modelling Method** : Dehorned rhinos : 75% reduction in poaching events
- More effective than "catching" poachers : Corruption in the system + Weak criminal justice system

Dehorning of Rhinos

Kaziranga NP :
UNESCO WHS

2 Districts:
Golaghat & Nagaon

75% World's
Population of One
Horned Rhino

Largest : Asiatic
Wild Buffalo

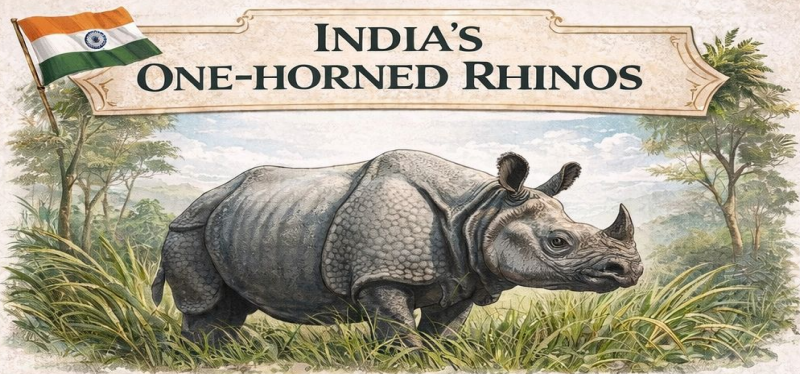
Largest : Eastern
race of Swamp
Deer

South of Brahmaputra river :
Wet alluvial tall grasslands &
semi - evergreen woodlands

Greater Kruger



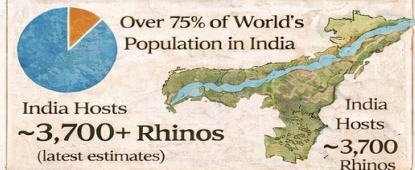
INDIA'S ONE-HORNED RHINOS



CONSERVATION STATUS

- **IUCN**: Vulnerable
- **CITES**: Appendix I
- **Wildlife (Protection) Act, 1972**: Schedule I
- Highest Level of Legal Protection

GLOBAL STRONGHOLD



MAJOR HABITAT

- Kaziranga National Park
 - Pobitora Wildlife Sanctuary
 - Manas National Park
 - Orang National Park
 - Jaldapara National Park
- Assam
West Bengal

SPECIES CHARACTERISTICS

- **Rhinoceros unicornis**
- Single black horn
- Armour-Like Skin Folds

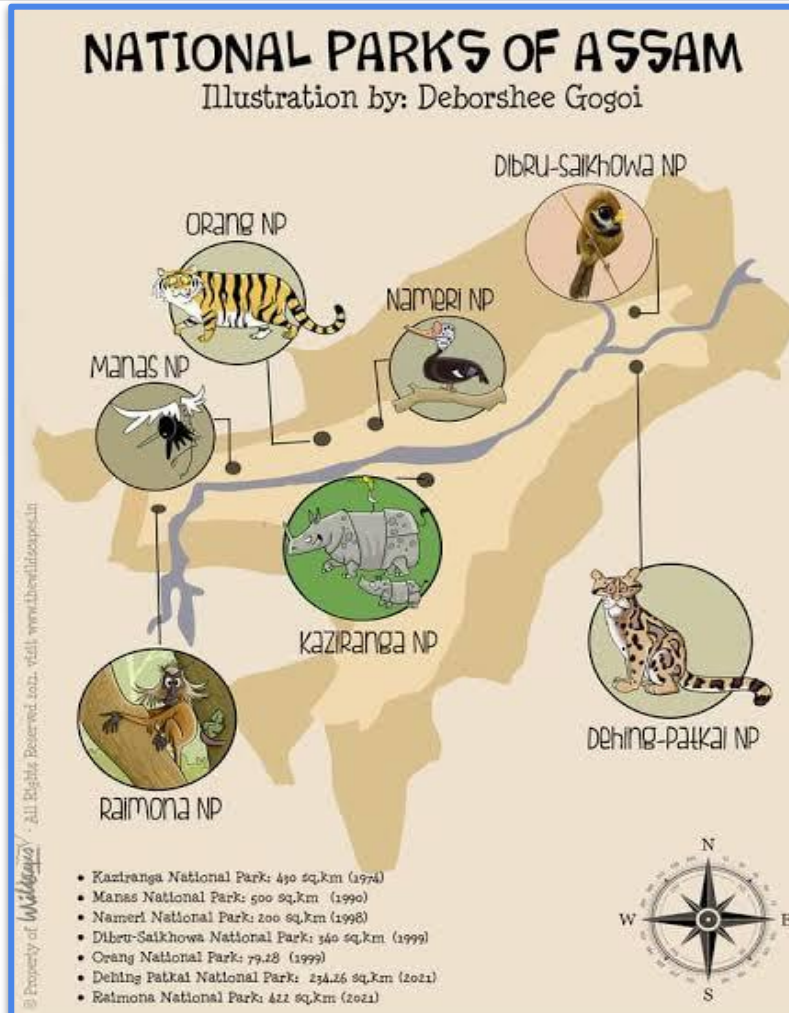
CONSERVATION SUCCESS



24th December 2025

"Dehorning" of Rhino

SYLLABUS: Prelims :Important Fauna in the News
Newspaper The Hindu **Page Number** : SCIENCE



ISRO's Heaviest Ever Launch



SYLLABUS : Prelims Science & Technology
Newspaper The Indian Express Page Number : EXPLAINED

ISRO's Heaviest Ever Launch

Context of News :

THE INDIAN Space Research Organisation (ISRO) is scheduled to launch the LVM-3 rocket carrying its heaviest-ever satellite — BlueBird Block-2, weighing nearly 6,100 kg — on Wednesday morning.

The LVM-3 rocket will also be used in the Gaganyaan mission, India's first crewed space mission, next year.

The satellite will be injected into an orbit of around 520 km just over 15 minutes after take-off. The BlueBird Block-2 satellite will be the largest-ever commercial communications satellite to be deployed in low Earth orbit (LEO). As the name suggests, LEO is an orbit that is relatively close to Earth's surface. It is normally at an altitude of less than 1,000 km.

BlueBird Block 2 :

Satellite designed by US Company AST SpaceMobile

"Direct to mobile" connectivity

4G, 5G voice & Video calls for "everyone, everywhere at all times"

Russia's refusal (Ukraine war) & ESA's launcher Ariane - 5 out of commission

SpaceX's Falcon & Ariane 6 v. ISRO's "Heavy launches at lower cost"

3rd commercial flight of LVM - 3: Powerful cryogenic engine

6100 Kgs : Heaviest Payload carried by ISRO

C32 Stage: 32000 kg of fuel & provide 50% velocity to place satellite in GTO

ISRO's Heaviest Ever Launch

About CMS - 03

What is a "Baahubali" Rocket?

SSLV

- For satellites weighing up to **500 kg** and required to be placed in **Low Earth Orbit** at an altitude of about **500 km**

PSLV

- Polar, Sun - Synchronous & Low Earth Orbits (LEO)
- Ideal for remote sensing, Earth observation & scientific missions
- Payloads of about **1750 kg**

GSLV

- With cryogenic upper stage is used for carrying heavier satellites of about **2,200 kg**

LVM - 3

- Heavy lift launch vehicle with carrying capacity **>4000 kgs**
- Main vehicles for communication satellites & **crewed missions (Gaganyaan)**

- Heaviest Communication satellite** launched from "Indian Soil" : **4410 kg**
- Launching Site : **SDSC, Sriharikota**
- Heaviest satellite ever launched? **GSAT - 11 : 5854 kg**
- Launching site : "**Kourou launch base**" in French Guiana onboard **Ariane - 5 rocket**
- Purpose : Multi - band (C, Ku bands) to provide coverage over **landmass & oceanic region**
- Lifespan : **15 years**
- Placed in **Geosynchronous Transfer Orbit (GTO)**



24th December 2025

SYLLABUS : Prelims Science & Technology
Newspaper The Indian Express Page Number : EXPLAINED

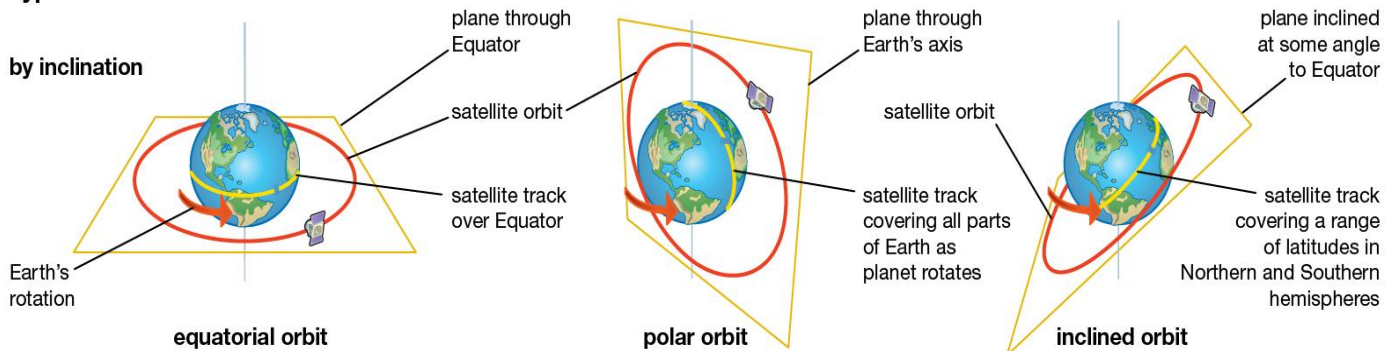
ISRO's Heaviest Ever Launch

What is Geosynchronous Orbit?

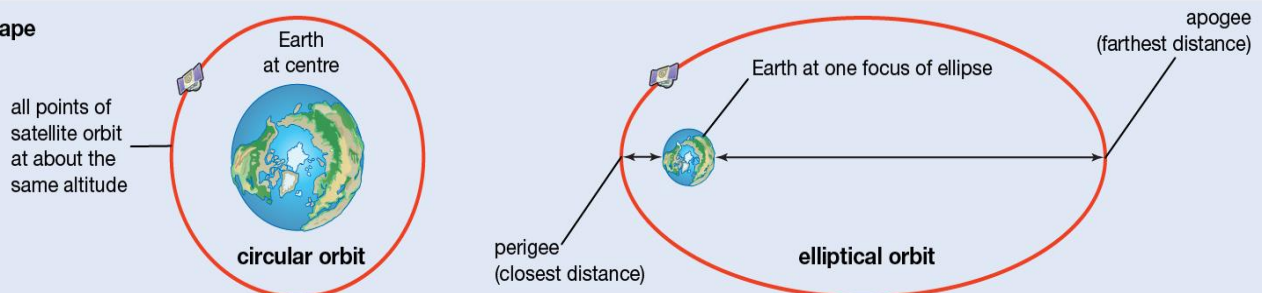
- Low inclination orbit about Earth having period of: **23 hours, 56 minutes & 4 seconds**
- Remain above earth at a **constant longitude**
- Returns to same point in sky at same time each day
- What is GTO? Transitional Orbit : Revolve from **Perigee to Apogee**
- Fuel efficiency & use onboard fuel for final adjustments

Types of Earth orbit

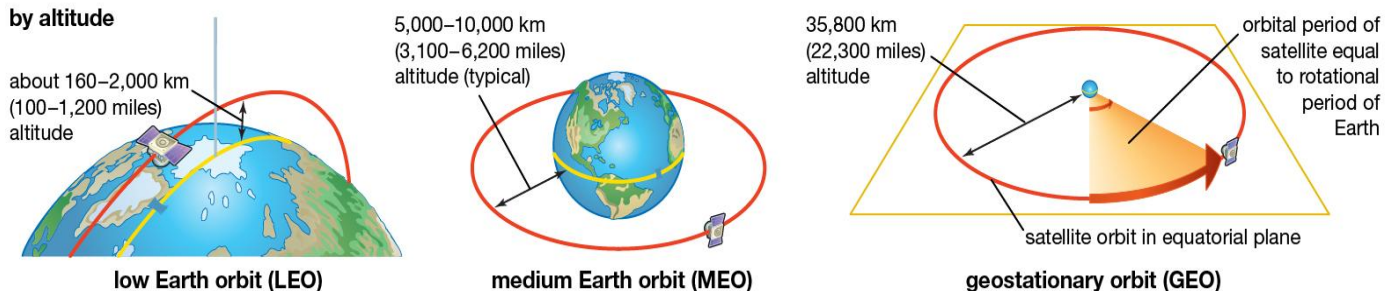
by inclination



by shape



by altitude



SYLLABUS : Prelims Important Acts & Policies of the Government
Newspaper The Indian Express Page Number : 11

Context of News :

THE BOMBAY High Court Tuesday asked fugitive businessman Vijay Mallya when he intended to come back to India, while hearing his plea challenging the invocation of the Fugitive Economic Offender (FEO) Act against him, along with his challenge to provisions of the Act.

ED alleged that Mallya committed bank fraud of over Rs 6,200 crore with an outstanding liability of nearly Rs 15,000 crore, including interest and, therefore, his plea challenging provisions of the FEO Act cannot be heard in his absence. The agency said he must submit to the judicial process in India.

Who is a Fugitive Economic Offender?

Defined under **Section 2(1)(f), FEOA, 2018**

Total value involved is **₹100 crore or more**

Has left India to avoid criminal prosecution

Enforcement Directorate (ED) files an application before a Special Court

How Can a Fugitive Economic Offender Be Brought Back to India?

Fugitive Mehul Choksi challenges extradition in Belgium Supreme Court

India has given a number of assurances to Belgium regarding Choksi's safety, the charges that he would face during trial in India, prison arrangements, human rights and medical needs.

Extradition Treaties (bilateral agreements)

Interpol Red Corner Notices

Mutual Legal Assistance Treaties (MLATs)

Diplomatic Pressure & Asset Freezing

Does India have any law for "Extradition"?

Extradition Act 1962

Dual Criminality Principle: Offence can be extradited only if it is "Crime" in both India & Requesting country

Applies to

- Foreign states with which India has extradition treaties
- Certain non-treaty states on basis of reciprocal arrangements

Extradition Treaties with 48 countries

India & Bangladesh has signed "Extradition Treaty" in 2013 which allows extradition based on police warrant without requiring full evidence

Refused under certain conditions

Offence is "Political" in nature or there exist chance of "Unfair trial"

24th December 2025

Rashtriya Vigyan Puraskar

SYLLABUS : Prelims Important National Awards
Newspaper The Indian Express **Page Number : 02**

Context of News :



Science Awards

President Droupadi Murmu arrives for the Rashtriya Vigyan Puraskar 2025 ceremony at the Rashtrapati Bhavan on Tuesday. PTI

National Award instituted by
Government of India

Recognise contributions of researchers
in field of **S & T & Innovation**

1st Given in 2024 :
A day ahead of **National Space Day**

Scrutiny by 17 member panel headed
by **Principal Scientific Advisor**

Final selection :
Minister of S & T

4 Categories of Awards :

Vigyan Ratna	Lifetime achievement and contributions in any field of science & technology
Vigyan Shri	Distinguished contributions in any field of science & technology
Vigyan Yuva SSB Awards	Young scientists : typically up to age 45 who have made exceptional contributions
Vigyan Team	Teams : 3 or more innovators working collaboratively

Shanti Swarup Bhatnagar
(1894-1955)

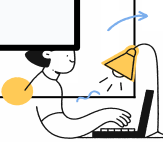
"Father of Research Laboratories" in India

1st **Director General** of the Council of Scientific & Industrial Research (CSIR)

Pioneer research on "**Colloids**" : substance with particles dispersed throughout another substance
: Eg - Milk, Fog etc

Innovative methods to use **Indian Bauxite, clay & Minerals** for Industrial chemicals

Bhatnagar - Mathur Magnetic Interference :
Measure magnetic properties of materials



24th December 2025

SYLLABUS : Prelims Important National Awards
Newspaper The Indian Express Page Number : 02

		
SCIENTIST	AWARD CATEGORY	RESEARCH CONTRIBUTION / ROLE
 Prof. Jayant Vishnu Narlikar (posthumous)	Vigyan Ratna * Vigyan Ratna * (posthumous)	Lifetime contributions to cosmology and gravitational physics, especially the Hoyle-Narlikar theory, reshaping understanding of the universe
 Dr. Gyanendra Pratap Singh	Vigyan Shri Vigyan Shri	Pioneering work in agricultural sciences, focusing on sustainable farming innovations and improving crop productivity
 Prof. Pradeep Thalappil	Vigyan Shri Vigyan Shri	Development of clean water technologies and advanced materials, including affordable water purification systems
 Prof. Mohanasaka Sivaprakasam	Vigyan Yuva – Shanti Swarup Bhatnagar Physics	technologies and high-resolution brain imaging platforms
 Prof. Amit Kumar Agarwal	Vigyan Yuva – Shanti Swarup Bhatnagar Physics	Theoretical research in quantum physics, especially quantum geometry and transport phenomena relevant to nanoelectronics and quantum devices
	Vigyan Yuva – Shanti Swarup Bhatnagar Physics	Theoretical research in quantum physics, especially quantum geometry and transport phenomena relevant to nanoelectronics and quantum devices



Q1. With reference to critical minerals and their defence applications, consider the following pairs:

Mineral	Application
1. Gallium & Germanium	Semiconductor devices for electronic warfare
2. Copper	Electromagnetic shielding and defence wiring
3. Cobalt, Lithium & Nickel	Advanced batteries powering electronics

Which of the pairs given above are correctly matched?

- a) 1 and 2 only
- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

Answer: d

Q2. Consider the following statements regarding Herfindahl–Hirschman Index (HHI):

- 1. It is a standard metric used to measure market concentration.
- 2. It is calculated by summing the squares of the market shares of firms in a market.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Answer: c

Q3. Consider the following statements regarding Janani Suraksha Yojana (JSY):

- 1. It is being implemented with the objective of reducing maternal and neonatal mortality by promoting institutional delivery among poor pregnant women.
- 2. Benefits under JSY are restricted to women above 19 years of age and up to three live births.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Answer: a

Q4. Consider the following statements regarding the Greater Kruger Region:

- 1. It is a large integrated wildlife conservation landscape in West Asia.
- 2. It includes Kruger National Park in South Africa and Limpopo National Park in Mozambique.
- 3. The Maasai Mara lies entirely within the Greater Kruger Region.

How many of the above statements is/are correct?

- a) Only One
- b) Only Two
- c) All Three
- d) None

Answer: a

Q5. Consider the following statements regarding a Fugitive Economic Offender (FEO):

- 1. The term is defined under the Fugitive Economic Offenders Act, 2018.
- 2. It applies to cases where the total value involved is ₹10 crore or more.

Which of the statements given above is/are not correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Answer: b





VAJIRAM & RAVI

Institute for IAS Examination

A unit of Vajiram & Ravi IAS Study Centre LLP

9-B, Bada Bazar Marg, Old Rajinder Nagar,
New Delhi - 110060 • Ph.: 41007400, 41007500

New No. 62, P Block, 6th Avenue, Anna Nagar,
Chennai - 600040 • Ph.: 044-4330-2121

Visit us at : www.vajiramandravi.com