GEO IAS
It's about quality

THE HINDU
INDIA'S NATIONAL NEWSPAPER SINCE 1878

Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

Wednesday, 18 Sep , 2024

Edition: International Table of Contents

Page 03 : Prelims Fact

A rainwater harvesting project by the Koduvayur grama panchayat in Kerala led to the discovery of numerous megalithic urn burials on Kundlikkad hill.

- This find, unusual for hilltops, may provide significant insights into the Mesolithic and Iron Age periods in Kerala.
- Archaeologist Dr. K. Rajan highlights the need for further excavation to understand and date these burials accurately.

Rain harvesting work reveals megalithic burial site

Abdul Latheef Naha
PALAKKAD

A rainwater harvesting project, undertaken by the Koduvayur grama panchayat, led to an unusually large number of megalithic urn burials on top of a hill in the Kollengode range of Nenmara forest division in Kerala.

An archaeologist, who examined the urn burials found on Kundlikkad hill in Palakkad district said they could throw up a significant insight into the links between mesolithic and iron age periods in Kerala.

Kundlikkad would not have captured the attention of archaeologists had a group of labourers not dug up 60-odd pits on the hill as part of the panchayat's rainwater harvesting project.

A capstone found on top of an urn burial on Kundlikkad hill in Koduvayur panchayat in Palakkad district of Kerala. At right are the microliths recovered from the burial site.

"It is rare to find such exclusive urn burials on hilltops," said Dr. K. Rajan, archaeologist and professor of history at Government Victoria College, Palakkad. "The burials may go back to more than 2,500 years. But without excavation, we cannot date it for sure," said Dr. Rajan, examining the microliths found from the site.

Dr. Rajan has been surveying the links between mesolithic and iron age periods in the State. "In most hill sites, what we see are cairn heaps with cists and cairn circles and stone circles containing cists and dolmens. But on this hill, we could find an unusually large number of classic urn burials," he said, calling for deeper studies.

Several urns were broken as the labourers went at rain pits without being aware of the archaeological significance of the region. One of the urn burial has a capstone intact. Many pot sherds were found from the region indicating the presence of such pottery as black ware, red ware, and black and red ware. "The megalith builders had deposited huge urns having thickness between 8 mm and 2 cm," said Dr. Rajan.

The urn found in one of the pits had fingertip impressions on it. "The pot sherds of smaller pots bear cord impressed designs," said Dr. Rajan. "The chisel marks found on the rock at many locations of the hill indicate that the capstones and the circling boulder stones were made using chisels," he said.

What Are Megaliths?

- A megalith is a large stone structure or monument from prehistoric times, often used in burials or ceremonial sites.
- Everything You Need To Know About
- These monuments, found mainly in the Deccan Plateau, the northeastern regions, and parts of South India, include dolmens, cairn circles, and menhirs.
- Dolmens are burial chambers made of upright stones covered by a large capstone.
- Cairn circles are stone formations used as grave markers, while menhirs are tall, upright stones often placed in rows.
- Megalithic sites, such as those in Karnataka, Tamil Nadu, and Kerala, offer insights into ancient burial practices, social hierarchies, and ceremonial activities.
- They are crucial for understanding India's early cultures and their advancements in stone technology and communal rituals.

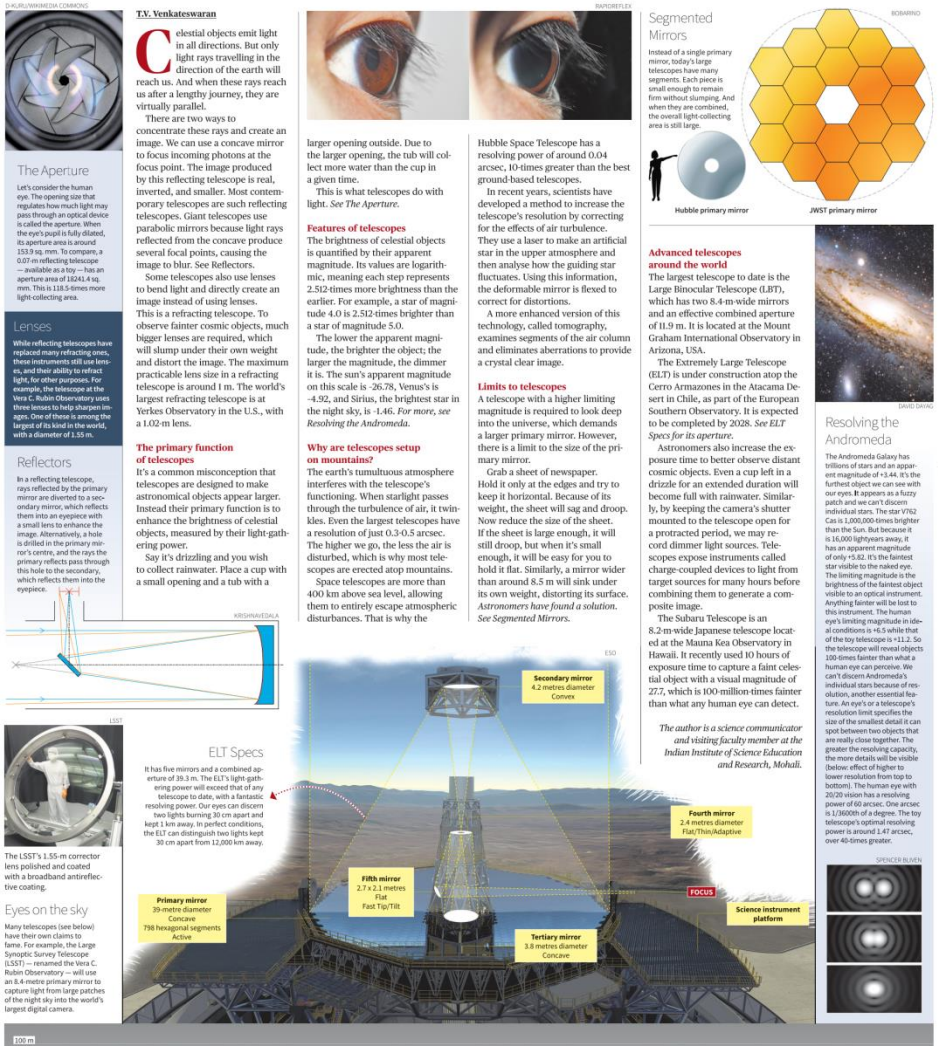
Page 04 : GS 3 : Science and Technology

The article explains the types of telescopes, including refracting and reflecting models, and their features such as aperture and apparent magnitude, as well as the advantages of mounting telescopes on mountains or in space.

- It highlights recent advancements like the Extremely Large Telescope and the James Webb Space Telescope.

What is a telescope?
How good are modern telescopes?

The modern telescope is a window into the universe, a sophisticated paintbrush in the hands of skilled astronomers that brings the fantastical wonders of the cosmos into view. And in so doing, telescopes give us an incomparable sense of our place and remind us of the joy of curiosity and exploration



T.V. Venkateswaran

Celestial objects emit light in all directions. But only light rays travelling in the direction of the earth will reach us. And when these rays reach us after a lengthy journey, they are virtually parallel.

There are two ways to concentrate these rays and create an image. We can use a concave mirror to focus incoming photons at the focus point. The image produced by this reflecting telescope is real, inverted, and smaller. Most contemporary telescopes are such reflecting telescopes. Giant telescopes use parabolic mirrors because light rays reflected from the concave produce several focal points, causing the image to blur. See Reflectors.

Some telescopes also use lenses to bend light and directly create an image instead of using lenses. This is a refracting telescope. To observe fainter cosmic objects, much bigger lenses are required, which will slump under their own weight and distort the image. The maximum practicable lens size in a refracting telescope is around 1 m. The world's largest refracting telescope is at Yerkes Observatory in the U.S., with a 1.02-m lens.

The primary function of telescopes

It's a common misconception that telescopes are designed to make astronomical objects appear larger. Instead their primary function is to enhance the brightness of celestial objects, measured by their light-gathering power.

Say it's drizzling and you wish to collect rainwater. Place a cup with a small opening and a tub with a larger opening outside. Due to the larger opening, the tub will collect more water than the cup in a given time.

This is what telescopes do with light. *See The Aperture.*

Features of telescopes

The brightness of celestial objects is quantified by their apparent magnitude. Its values are logarithmic, meaning each step represents 2.512-times more brightness than the earlier. For example, a star of magnitude 4.0 is 2.512-times brighter than a star of magnitude 5.0.

The lower the apparent magnitude, the brighter the object; the larger the magnitude, the dimmer it is. The sun's apparent magnitude on this scale is -26.78, Venus's is -4.92, and Sirius, the brightest star in the night sky, is -1.46. *For more, see Resolving the Andromeda.*

Why are telescopes setup on mountains?

The earth's tumultuous atmosphere interferes with the telescope's functioning. When starlight passes through the turbulence of air, it twinkles. Even the largest telescopes have a resolution of just 0.3-0.5 arcsec. The higher we go, the less the air is disturbed, which is why most telescopes are erected atop mountains.

Space telescopes are more than 400 km above sea level, allowing them to entirely escape atmospheric disturbances. That is why the Hubble Space Telescope has a resolving power of around 0.04 arcsec, 10-times greater than the best ground-based telescopes.

In recent years, scientists have developed a method to increase the telescope's resolution by correcting for the effects of air turbulence. They use a laser to make an artificial star in the upper atmosphere and then analyse how the guiding star fluctuates. Using this information, the deformable mirror is flexed to correct for distortions.

A more enhanced version of this technology, called tomography, examines segments of the air column and eliminates aberrations to provide a crystal clear image.

Limits to telescopes

A telescope with a higher limiting magnitude is required to look deep into the universe, which demands a larger primary mirror. However, there is a limit to the size of the primary mirror.

Grab a sheet of newspaper. Hold it only at the edges and try to keep it horizontal. Because of its weight, the sheet will sag and droop. Now reduce the size of the sheet. If the sheet is large enough, it will still droop, but when it's small enough, it will be easy for you to hold it flat. Similarly, a mirror wider than around 8.5 m will sink under its own weight, distorting its surface. *Astronomers have found a solution. See Segmented Mirrors.*

Advanced telescopes around the world

The largest telescope to date is the Large Binocular Telescope (LBT), which has two 8.4-m-wide mirrors and an effective combined aperture of 11.9 m. It is located at the Mount Graham International Observatory in Arizona, USA.

The Extremely Large Telescope (ELT) is under construction atop the Cerro Armazones in the Atacama Desert in Chile, as part of the European Southern Observatory. It is expected to be completed by 2028. *See ELT Specs for its aperture.*

Astronomers also increase the exposure time to better observe distant cosmic objects. Even a cup left in a drizzle for an extended duration will become full with rainwater. Similarly, by keeping the camera's shutter mounted to the telescope open for a protracted period, we may record dimmer light sources. Telescopes expose instruments called charge-coupled devices to light from target sources for many hours before combining them to generate a composite image.

The Subaru Telescope is an 8.2-m-wide Japanese telescope located at the Mauna Kea Observatory in Hawaii. It recently used 10 hours of exposure time to capture a faint celestial object with a visual magnitude of 27.7, which is 100-million-times fainter than what any human eye can detect.

The author is a science communicator and visiting faculty member at the Indian Institute of Science Education and Research, Mohali.

What is a Telescope?

- A telescope is a tool used to observe distant objects by collecting light. It reveals celestial wonders by magnifying images and focusing on faint light rays.

The Aperture

- Aperture refers to the opening that collects light. A larger aperture allows more light to be gathered, creating clearer and more detailed images.

Lenses vs. Reflectors

- Refracting telescopes use lenses to bend light, focusing it at a specific point.
- Reflecting telescopes use mirrors to gather and focus light, offering better clarity and reduced distortion compared to refractors.

Features of Telescopes

- Brightness and visibility of celestial objects depend on apparent magnitude, which scales inversely with brightness (lower numbers are brighter).
- For example, Sirius is the brightest star, with a magnitude of -1.46.

Why Are Telescopes Setup on Mountains?

- Mountain observatories provide clearer skies due to reduced atmospheric distortion.
- Space telescopes, above the atmosphere, deliver even clearer views.

Advanced Telescopes

- The Extremely Large Telescope (ELT), located in Chile, is one of the most advanced telescopes, with a 39-meter aperture for high-resolution images.
- The James Webb Space Telescope (JWST) uses segmented mirrors to focus light more efficiently, crucial for infrared observations.

Evolution in Telescope Technology

- Modern telescopes use adaptive optics to correct atmospheric turbulence.
- The Hubble Space Telescope captures images with a resolution of 0.04 arc seconds, aiding in deep-space exploration.

Page 06 : Prelims Fact

Recent updates on the India-China border dispute indicate that while significant disengagement has occurred at most friction points, Demchok and Depsang remain unresolved.

- The issue gains prominence as leaders prepare for the upcoming BRICS Summit, reflecting ongoing border tensions.

No progress in resolution of Demchok and Depsang friction points in 2 years

NEWS ANALYSIS

Dinakar Peri
NEW DELHI

There has been much hype over External Affairs Minister S. Jaishankar's comments that 75% of disengagement has been completed by India and China along the Line of Actual Control (LAC) in eastern Ladakh and the Chinese response that both sides have undertaken disengagement from four areas in the border areas.

However, the fact remains that both sides have undertaken mutually agreed and verified disengagement from five friction points while two more friction points, Demchok and Depsang, remain and there has been no progress towards their resolution in the past two years.

The widespread optimism, once again, of a possible breakthrough between the two countries in achieving further disengagement in the four-year-long stand-off, comes in the run-up to the BRICS (Brazil, Russia, India, China, and South Africa) Summit in October, which both Prime Minister Narendra Modi and Chinese President Xi Jinping are scheduled to attend. This is akin to a similar situation last year before the BRICS Summit in August.

No headway: Last disengagement was a result of understanding reached during the 16th round of military talks in 2022. AFP

Speaking in Geneva on September 12, Mr. Jaishankar said "roughly" about "75% of disengagement problems are sorted out". "We still have some things to do," he said, adding that "there is a bigger issue that both of us have brought forces close up and in that sense, there is a militarisation of the border."

"There has been no change in the ground situation since the last disengagement two years back," a defence official noted. Both sides have stated that after disengagement from the friction areas, they would undertake de-escalation, though the phrase "restoration of *status quo ante*" is being heard less and less. However, there is expectation of a possible disengagement from Demchok, though there is no clarity on any immediate Corps Commander-level talks.

'Generally stable'

Responding to questions on National Security Adviser Ajit Doval and Chinese Foreign Minister Wang Yi's meeting, Chinese Foreign Ministry Spokesperson Mao Ning, at a regular press conference on September 13, said, "In recent years, frontline armies of the two countries have realised disengagement from four areas in the western sector of the China-India border, including the Galwan Valley. The China-India border situation is generally stable and under control."

With disengagement undertaken from five of seven points, as stated by officials on several occasions, it is statistically around 71.5%, quite close to 75%, and also withdrawal of forces was acknowledged and verified on the ground, each time, by both sides.

Since the Corps commander-level talks in 2020, the two sides have so far undertaken disengagement from five friction points – from Galwan after the violent clash in June 2020, from the North and South Banks of Pangong Tso in February 2021, from Patrolling Point (PP) 17 in the Gogra-Hot Springs area in August 2021 and PP15 in September 2022. The last disengagement, from PP15, was a result of the understanding reached during the 16th round of Corps Commander-level military talks on July 17, 2022.

Analysis of the news:

- External Affairs Minister S. Jaishankar reported that India and China have completed 75% of disengagement along the Line of Actual Control (LAC) in eastern Ladakh.
- China has acknowledged disengagement from four border areas, but two friction points, Demchok and Depsang, remain unresolved.
- Everything You Need To Know About
- There has been no progress on these two points in the past two years.

- The situation is described as “generally stable” by Chinese Foreign Ministry Spokesperson Mao Ning.
- Issues Over Demchok And Depsang Regions
- The Demchok and Depsang regions in Ladakh have been contentious areas between India and China.
- At Demchok, tensions arose due to Chinese incursions and the construction of infrastructure near the Line of Actual Control (LAC), which India views as provocative.
- In Depsang, China’s activities, including patrols and road construction within what India considers its territory, have led to standoffs.
- Both areas highlight ongoing disputes over the LAC and differing perceptions of territorial boundaries.

Page 07 : Prelims Fact

Rapa Nui genomes reveal the genetic history and population dynamics of Easter Island's inhabitants.

- They help correct myths about ecological collapse, show real historical population changes, and provide insights into ancestry and external impacts on the island's history.

Rapa Nui genomes restore the real history of an old, troubled people

Studying Indigenous genomes offers invaluable insights into historical population dynamics, ecological adaptations, and the complex stories of human migration and survival. In many ways, the Rapa Nui genomes also show how genomic evidence can expose the derogatory myths that often surround Indigenous peoples

Sridhar Sivasubbu
Vinod Scaria

The Ahu Tongariki stone platform on Rapa Nui with all its 15 moai, restored in the 1990s. BJØRN CHRISTIAN TØRRISSEN (CC BY-SA 3.0)

THE GIST

In the book *Collapse*, it was proposed that the population collapsed after overexploiting resources. The idea found acceptance and became an example of the importance of sustainable living. But some scholars called into question the feeble evidence provided

According to a study, the Rapa Nui population grew until Europeans arrived, followed by two catastrophic events: Chilean slave traders abducted a third of the population, and then there was a smallpox outbreak. Numbers dwindled to one hundred or so

The study concludes that the pre-modern Rapa Nui didn't overexploit the resources of their small island. In fact, they may have been living responsibly, only to be decimated by the apathy of other peoples

The volcanic island of Rapa Nui has long been shrouded in mystery. European sailors first arrived on its shores on Easter Sunday in 1722, giving it its colloquial name: Easter Island. It covers just 160 sq. km and is one of the most remote islands on the planet. Today, Rapa Nui is part of Polynesia and is officially a territory of Chile.

Early Polynesian explorers are believed to have traversed thousands of kilometres of open ocean to reach and settle the island, likely arriving centuries before the Europeans. The island's geography is harsh and challenging for humans. Its lava-covered terrain is rocky with limited freshwater sources, poor soil quality, and a low diversity of flora and fauna.

Despite these challenges, its first humans likely established a unique society in order to survive their exacting environs. However, the island's offerings would still have been quite finite, and ingenuity could only have taken the people so far. These realities gave rise to the widely held notion that the humans eventually overpopulated the island, resulting in ecological collapse and its people's demise.

But new evidence suggests this view may be fiction.

Turning the gaze within

Rapa Nui is famous for its large statues called moai. They are shaped like large human heads and erected on stone pedestals. Some moai stand 40 feet tall and weigh 75 tonnes. They were carved in volcanic stone at quarries and then moved to their current locations across the island. Scholars believe the Rapa Nui built the moai between the 13th and the 16th centuries and represented their revered ancestors.

The statues all face inland, towards the people. Over 900 moai have been found on the island to date; more than half of them were transported across considerable distances from the quarries.

In his book 2004 *Collapse*, Jared Diamond proposed the population of Rapa Nui collapsed after overexploiting resources. The idea quickly found wide acceptance and became an example of the importance of sustainable living. But some scholars have called into question the feeble evidence to support the hypothesis.

Protecting the soil

Scientists think the island's population had declined by around 1,600 before European explorers arrived in the 18th century. By then, the population was estimated to be around 1,500-3,000.

Due to the limited availability of freshwater and the abundance of rocks, which limited widespread agriculture, the natives are believed to have burnt the palm vegetation to improve soil productivity.

They were also expected to have used rock gardening, a.k.a., lithic mulching: a way to protect soil moisture by regulating the temperature.

Either way, before the European settlers made contact with the Rapa Nui, the latter practised a limited agriculture to produce their food.

A long-awaited census

In July, researchers from Columbia University, Arizona University, and Binghamton University, plus independent researchers from Rapa Nui, reported training an AI model to identify locations in satellite images of the island where its inhabitants practised rock-gardening.

The researchers estimated rock gardening was practised in less than 1 sq. km of the land, lower than previous estimates of 4-20 sq. km. Assuming the inhabitants exclusively cultivated sweet potatoes, the findings suggest they may have numbered fewer than 4,000 people.

Genetic studies have in the past provided unique insights into the histories of Indigenous and ancestral populations around the world. In 2014, *Current Biology* journal published a paper in which researchers analysed 27 genomes of the Rapa Nui people and concluded they had a considerable Native American ancestry, of around 8%. They also found the admixture with Native Americans happened before the 18th century. A significant European admixture followed when Europeans discovered and then colonised the island in the 18th century.

> Early Polynesian explorers are believed to have traversed thousands of kilometres of open ocean to reach and settle the island, likely arriving centuries before the Europeans

Two catastrophes

In the event of an ecological collapse or a population bottleneck (when the genetic diversity of the population becomes so low as to become unable to withstand shocks like new diseases or disasters), the genomes would have been quite un-diverse in the population's descendants. Such "signals" could in turn provide insights into bottlenecks in the history of that population.

Members of the Rapa Nui community resisted an initial attempt by researchers to study their genomes. So a team led by Víctor Moreno-Mayar at the University of Copenhagen turned to the remains of 15 Rapa Nui people secured at a museum in Paris. The remains were dated to have originated between 1670 and 1950 AD. The team extracted and sequenced DNA from tissue samples and reported their findings on September 11 in *Nature*.

According to the study, the Rapa Nui population developed a bottleneck around 1300 AD – confirming a previous finding that highlighted the same date and, crucially, ruling out a population decline in around 1600 AD. Instead, the study suggested the population steadily grew until the European settlers arrived, followed by two catastrophic events: Chilean slave traders abducted more than a third of the population, and then there was a large outbreak of smallpox. The local population soon dwindled to one hundred or so individuals as a result.

Restoring real histories

So there we have it: the pre-modern Rapa Nui didn't overexploit the resources of their small island. In fact, they may have been living responsibly, only to be decimated by the apathy of other peoples.

Studying indigenous genomes offers invaluable insights into historical population dynamics, ecological adaptations, and the complex stories of human migration and survival. In many ways, the Rapa Nui genomes also show how genomic evidence can expose the derogatory myths that often surround Indigenous people and give them their real histories back.

(The authors are senior consultants at Karkinos Healthcare and adjunct professors at IIT Kanpur and the D.Y. Patil Medical College, Pune. sridhar.sivasubbu@gmail.com, vinod.scaria@karkinos.in)

What Are Rapa Nui?

- The Rapa Nui, also known as the people of Easter Island, are Polynesians native to this remote island in the southeastern Pacific Ocean.

- Famous for their monumental stone statues called moai, they developed a complex society and culture.
- The Rapa Nui's history includes periods of significant population growth and dramatic decline, influenced by both internal factors and external impacts from European contact.

How They Help Restore Real History

- Uncover Population History: Genomic data can reveal past population sizes and changes. For instance, recent studies show that the Rapa Nui population was larger and more stable before European contact than previously thought.
- Reveal Ancestry and Mixing: Genomic studies reveal how Rapa Nui people are related to other populations, including Native Americans and Europeans, providing a clearer picture of historical interactions and migrations.

More About New Study

- Recent research on the Rapa Nui (Easter Island) challenges the idea that resource overexploitation caused their population collapse.
- The study reveals that the Rapa Nui population grew until European contact, which introduced two major catastrophes: the abduction of a third of the population by Chilean slave traders and a devastating smallpox outbreak.
- The findings suggest that the Rapa Nui were managing their resources sustainably and that external factors, rather than internal mismanagement, led to their decline.

Page 10 : GS 2 : International Relations

The deepening Sino-Russian relationship, exacerbated by Russia's growing economic reliance on China, has raised concerns about Moscow's ability to maintain strategic autonomy.

- This power asymmetry poses challenges for India, as Russia's alignment with China could hinder its reliability as a security partner for New Delhi amidst geopolitical tensions.

Power asymmetry between China and Russia

As supplies from Moscow's traditional partners have dried up under sanctions and Russia's domestic capacity remains stretched, China has stepped up to help its friend. Compared to 2021, when high-priority goods from China accounted for 32% of Russia's import needs, China's share soared to 89% in 2023

WORLD INSIGHT

Amit Kumar

The Russian invasion of Ukraine in 2022 has brought about a major shift in the world order. Not only did it bring about a stronger trans-Atlantic alignment vis-a-vis Russia, but it has also pushed the latter closer to China. Consequently, strategists around the globe have been preoccupied with the repercussions of such a partnership between the two countries. The deepening Sino-Russian relationship has become a subject of discussion in India as well. The concern that one of India's most trusted partners now possibly shares an indispensable friendship with India's primary adversary has instigated debate around the reliability of Russia as a security partner. In this context, the most recurrent question that is being raised is: has Russia become a junior partner of China? The answer to the question will determine the autonomy that the Kremlin can exercise when it comes to choosing between Beijing and New Delhi.

Against the U.S.-led financial order

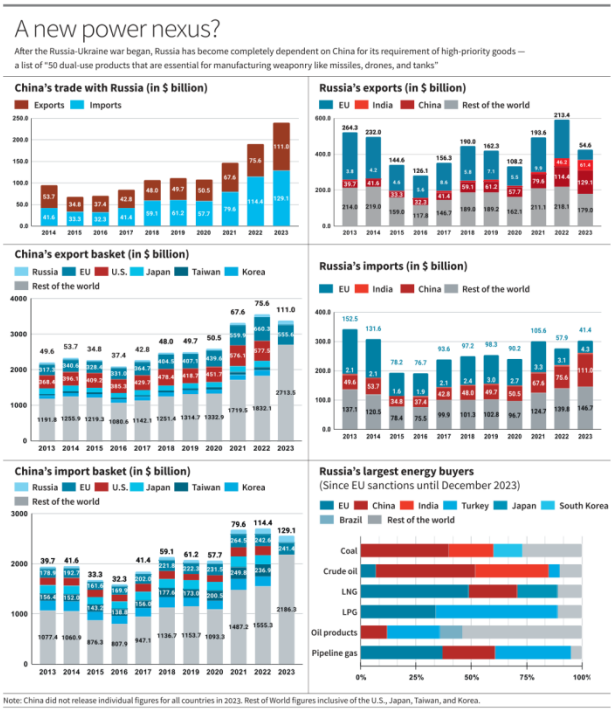
The two countries have a shared grievance against the dual hegemony of the dollar and the SWIFT messaging system central to the current global financial system. Their perpetual tension with the U.S.-led geopolitical order of the West puts them in a vulnerable spot – the effects of which have become more pronounced lately.

Following Russia's invasion of Ukraine in 2022, the U.S. and its allies froze close to $300 billion of Russia's forex reserves held overseas. China fears a similar threat in the event of a conflict with the West as around $770 billion of China's $3 trillion forex reserves are currently held in U.S. treasuries. Further, in 2024, the West imposed a SWIFT ban on Russian financial institutions involved in transactions of dual-use goods or weapons. The U.S. also threatened secondary sanctions on third-country financial institutions involved in such transactions with Russia. Fearing secondary SWIFT sanctions, Chinese financial institutions have withheld transactions worth tens of billions of yuan from Russia.

Thus, the two countries have a joint objective to reform (upend) the existing financial and economic order. The two have tried to promote de-dollarisation and alternative payment settlement systems, albeit without much success. Even as the two settled more than 90% of their bilateral trade in local currencies in 2023, this amounted to less than a percent of current account transactions globally. Renminbi-denominated transactions in settling trade amount to only around 6% of global transactions, which were otherwise dominated by the dollar, euro, pound and yen.

China's effort to promote the Cross-Border Interbank Payment System (CIPS) – its home-grown payment settlement system – is far from challenging SWIFT anytime soon, limiting its utility.

However, Russia's isolation from the Western-dominated global financial system makes its need for an alternative much more urgent. China's requirements aren't as urgent despite its grievances, as Beijing is still very much a part of the system. This essentially leaves Russia at China's mercy to set the pace for reforms. Furthermore, China alone has the diplomatic and monetary resources to mount a potential challenge to the Western-dominated financial order. Russia's isolation and limited resources render it completely dependent on China to pull it out of its misery.



Asymmetry in bilateral trade

At first glance, China-Russia trade appears symmetric over the years. In fact, Russia maintains a modest trade surplus over China. However, the asymmetry becomes apparent when their bilateral trade is put in the wider context of their respective overall trade.

In 2023, while exports to China made up for around 30.4% of Russia's total exports, Russia accounted for only 3% of China's total exports. While imports from China accounted for 36% of Russia's total imports in 2023, China's imports from Russia amounted to ~5% of its total imports.

Secondly, more than 70% of Russia's exports to China were energy (fossil fuel) in 2022. In contrast, China's exports to Russia were relatively more diversified. This makes Russia's exports to China prone to shocks and uncertainties. Thirdly, not only are Russia's exports to China dominated by energy, but a majority of Russia's global energy exports are also concentrated in China. This is significant because the revenues from the energy sector have contributed between 30-50% of Russia's annual federal budget in the last 10 years. Moreover, the oil and gas sector contributes about 20% of Russia's GDP.

This renders the Kremlin's economy largely dependent on China.

And lastly, Russia has lately become completely dependent on China for its requirement of high-priority goods – a list of "50 dual-use products that are essential for manufacturing weaponry like missiles, drones, and tanks." The war in Ukraine has significantly enhanced the importance of the metalworking industry, which is critical to producing machine tools necessary for arms manufacturing. As supplies from Moscow's traditional partners have dried up under sanctions and Russia's domestic capacity remains stretched, China has stepped up to help its friend. Compared to 2021, when high-priority goods from China accounted for 32% of Russia's import needs, China's share soared to 89% in 2023. Additionally, China's share in Russian imports of critical machine tools has increased from 28% in 2021 to 59% in 2022. In 2023, almost all of Russia's requirements were sourced from China.

In the process, over the last few years, China has completely dethroned the EU as Russia's primary trade partner. Moreover, it has absorbed majority of Russia's losses emanating from reduced trade with the EU. This has kept Moscow's trade figures largely stable despite stringent sanctions from the West. To sum up, China has emerged as Russia's most indispensable partner.

What does it mean for India?

Despite all the goodwill that exists in the India-Russia relationship, the Kremlin's geopolitical goals align more closely with Beijing's than New Delhi's.

Further, trade between India and Russia constitutes only a minuscule percentage of the expanding China-Russia trade. The strategic alignment between China and Russia is too deep, and the asymmetry in their economic ties is too wide for Moscow to exercise any autonomy vis-a-vis India if it ever came down to choosing between New Delhi and Beijing. The question is no longer about Russia's willingness but its capability to resist China's pressure.

Amit Kumar is a Staff Research Analyst at Takshashila Institution. He tweets at am_i_t_kumar.

THE GIST

- China and Russia have a shared grievance against the dual hegemony of the dollar and the SWIFT messaging system central to the current global financial system.
- Following Russia's invasion of Ukraine in 2022, the U.S. and its allies froze close to $300 billion of Russia's forex reserves held overseas. China fears a similar threat in the event of a conflict with the West as around $770 billion of China's $3 trillion forex reserves are currently held in U.S. treasuries. Further, in 2024, the West imposed a SWIFT ban on Russian financial institutions involved in transactions of dual-use goods or weapons.
- Despite all the goodwill that exists in the India-Russia relationship, the Kremlin's geopolitical goals align more closely with Beijing's than New Delhi's.

Power Asymmetry between Russia and China:

- China dominates bilateral trade, with Russian exports making up 30.4% of Russia's total exports but only 3% of China's.

- Russia's exports to China are largely energy-dependent (70%), whereas China's exports to Russia are more diversified.
- Russia's economy is heavily reliant on energy revenues, which make up 30-50% of its federal budget.
- Russia relies on China for critical high-priority goods, including dual-use products essential for arms manufacturing.
- China has replaced the EU as Russia's top trade partner, absorbing losses from Western sanctions.
- Russia's dependence on China has grown since 2021, making Moscow increasingly vulnerable to Beijing's influence.

What it Means for India:

- Russia's growing dependence on China limits its strategic autonomy, impacting its ability to balance relations with India.
- India-Russia trade is minimal compared to the expanding China-Russia trade, diminishing Moscow's leverage to prioritise New Delhi.
- As the Sino-Russian relationship deepens, Russia's geopolitical goals align more closely with China's than with India's.
- This power asymmetry raises concerns about Russia's capability to resist Chinese pressure in the event of conflicting interests between India and China.

.

Demographic advantage, Indian economy's sweet spot

Subhrakant Panda

Managing Director, Indian Metals and Ferro Alloys Limited (IMFA)

Much has been written about India's emergence as an economic giant – it is the world's fastest growing big economy, and is currently the fifth largest. Demographics is a major factor in propelling this rise given that the median age is around 28 years and 63% of the population is of working age. However, the labour force participation rate stood at 55.2% in 2022, according to a recent report released by the International Labour Organization (ILO), which goes on to state that falling labour intensity is likely due to growth being led by the services sector rather than manufacturing. Therefore, while we are certainly not experiencing "jobless growth", more steps are needed to harness the demographic dividend.

Continue with the reforms agenda

First and foremost, there is a need to press ahead with the ongoing reforms agenda to maintain, if not accelerate, India's growth trajectory as that by itself will create opportunities galore. There was a welcome reference to this in Finance Minister Nirmala Sitharaman's Budget speech to initiate and incentivise improvements in productivity and to facilitate markets and sectors to become more efficient. While there is much that the Centre has done to enhance ease of doing business, much of what needs to be done next, especially in the context of production, concerns the States (which is where the action is now). Hence, both need to walk in lockstep to broaden and deepen reforms.

The Economic Survey for 2023-24 states that technological advancements have led to a declining capital-to-output ratio and an increasing capital-to labour ratio. It was perhaps in this context that Arvind Panagariya, economist and Chairman of the 16th Finance Commission, while speaking at a recent event in the Federation Of Indian Chambers Of Commerce and Industry said capital-led economic growth is not ideal as the country has an abundance of labour.

The reluctance of Micro, Small and Medium Enterprises, the backbone of employment, to grow in size and scale as well as that of large business houses to foray into labour-intensive sectors can be attributed to the compliance burden and costs imposed by outdated labour laws.

The impasse over implementing the new labour codes approved by Parliament is sending a wrong signal to existing and prospective investors alike. It is important that one or two States with an evolved manufacturing ecosystem break the logjam by taking the lead.

The Centre's efforts to give a boost to the manufacturing sector is generally viewed from the angle that it is untenable for 45% of the workforce to be employed in the agricultural sector which accounts for only 18% of GDP. While taking steps to enhance agricultural productivity, we must not forget those who are engaged in the unorganised and non-agricultural sectors – about 19% of the workforce – which are highly fragmented and suffer from low productivity.

It is important to address their aspirations by focusing on high-growth potential sectors such as toys, apparel, tourism, and logistics which are also labour intensive. Then, as skills get upgraded, there will be an opportunity to move up the value chain and provide even better and higher paying jobs.

Skilling is a continuous process

Skilling is an important aspect of making future generations productive members of society. The Economic Survey highlighted that only 4.4% of the workforce in the age cohort of 15-29 years is formally skilled. This is a huge concern, and the dichotomy of labour surplus and skills shortage must be addressed through meaningful public-private partnerships wherein industry plays an integral role in devising the curriculum and imparting 'on the job training'. Moreover, skilling is not a one-time intervention but a lifelong process which requires flexibility in institutional mechanisms as well as learning agility.

The emphasis of the New Education Policy (NEP) 2020 on foundational skills as well as higher order cognitive skills and critical thinking is a good step but, in a constantly changing world, the document must be reviewed periodically and updated.

Impact of AI/ML

Finally, in an era of artificial intelligence (AI) and machine learning (ML), repetitive tasks with low skills are most at risk but there will always be a need for human intervention and oversight. While we must not underestimate the impact of AI/ML, neither should it be demonised. The key is to have appropriate regulations govern its use while harnessing what it has to offer. In addition to the opportunities offered by various emerging sectors, AI/ML itself is estimated by Statista to grow by nearly nine times to become a $826.73 billion worldwide market by 2030. Further, according to NASSCOM, India already has the second largest talent pool globally in this field but the current gap between demand and supply is 51% which is projected to widen. Though very niche, it is an opportunity which should not be missed.

Gainfully employing a large, young and aspirational population is not easy but it is a far better challenge to have than dealing with an ageing one with its attendant economic and societal implications. India is in a sweet spot and must employ a holistic approach to create a talent pool so as to harness its demographic dividend for the benefit of the world at large.

Gainfully employing a large, young and aspirational population is not easy but it is a challenge India can take on

GS Paper 03 : Indian Economy – Issues relating to development and employment.

PYQ: (UPSC CSE (M) GS-2 2021): "Demographic Dividend in India will remain only theoretical unless our manpower becomes more educated, aware, skilled and creative." What measures have been taken by the government to enhance the capacity of our population to be more productive and employable? (200 w /12.5 m)

UPSC Mains Practice Question Discuss the challenges and opportunities posed by India's demographic dividend, with a focus on labour reforms, skilling initiatives, and the impact of technological advancements like AI/ML on employment. (250 w /15 m)

Context :

- India is experiencing rapid economic growth, driven by its demographic advantage.
- However, India faces challenges like low labour force participation, outdated labour laws, and a shortage of skilled workers.
- Addressing these issues through reforms, improved skilling, and promoting labour-intensive sectors is crucial to fully harnessing the demographic dividend and ensuring sustainable growth in the face of AI/ML advancements.

India's Economic Emergence and Labour Force Dynamics

- India is currently the world's fastest-growing large economy and ranks as the fifth largest.
- The nation's demographic advantage plays a key role in this rise, with a median age of around 28 years and 63% of the population being of working age.
- However, India's labour force participation rate was 55.2% in 2022, according to the International Labour Organization (ILO).
- The growth led by the services sector, rather than manufacturing, has resulted in lower labour intensity.
- While India is not experiencing "jobless growth," more efforts are needed to harness its demographic dividend.

Need for Reforms to Sustain Growth

- To maintain or accelerate India's growth trajectory, it is crucial to continue with reforms that create new opportunities.
- Despite the Centre's efforts to enhance ease of doing business, many of the necessary reforms, particularly in the context of production, must come from the States.
- Both the Centre and States need to collaborate to ensure that reforms are broadened and deepened.

Capital-Led Growth and Labour Intensive Sectors

- Technological advancements have led to a decrease in the capital-to-output ratio while increasing the capital-to-labour ratio.
- Economist Arvind Panagariya highlighted the need for labour-led economic growth, as India has an abundant labour supply.
- Micro, Small, and Medium Enterprises (MSMEs), the backbone of employment, are reluctant to grow in size due to the burden of outdated labour laws.
- Delays in implementing the new labour codes send negative signals to investors, and States with evolved manufacturing ecosystems should take the lead in breaking the logjam.

Focus on High-Growth and Labour-Intensive Sectors

- The Centre's focus on manufacturing is partly driven by the need to shift workers from agriculture, which employs 45% of the workforce but contributes only 18% of GDP.
- In addition to improving agricultural productivity, attention should also be paid to unorganised and non-agricultural sectors, which employ 19% of the workforce but suffer from low productivity.
- High-growth potential sectors such as toys, apparel, tourism, and logistics, which are labour-intensive, must be prioritised.
- As skills improve, there will be opportunities for workers to move up the value chain and secure better-paying jobs.

Importance of Skilling the Workforce

- Skilling is vital for making future generations productive members of society.
- Only 4.4% of the workforce in the 15-29 age group is formally skilled, a major concern.
- The labour surplus and skills shortage should be addressed through public-private partnerships, where industries play a role in developing curriculums and offering on-the-job training.
- Skilling must be a lifelong process, and flexibility in institutional mechanisms is essential to ensure continuous learning.

Impact of Artificial Intelligence and Machine Learning

- Repetitive, low-skilled jobs are at risk due to the rise of artificial intelligence (AI) and machine learning (ML), but human intervention will always be needed.
- The AI/ML market is expected to grow significantly, reaching $826.73 billion globally by 2030.

- India has the second-largest talent pool in AI/ML, but there is a 51% gap between supply and demand, a gap that is expected to widen.
- India should seize this opportunity to remain competitive in the global market.

Conclusion

- Gainfully employing India's large, young population is challenging but more advantageous than dealing with an ageing population.
- A holistic approach is required to create a skilled talent pool, allowing India to harness its demographic dividend and contribute to the global economy.