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DAILY NEWS ANALYSIS

15 - DEC - 2022

FOREWORD

We, at Team Vedhik is happy to introduce a new initiative - "Vedhik - Daily News Analysis (DNA)_The Hindu" compilations to help you with UPSC Civil Services Examination preparation. We believe this initiative - "Vedhik - Daily News Analysis (DNA)_The Hindu " would help students, especially beginners save time and streamline their preparations with regard to Current Affairs. A content page and an Appendix has been added segregating and mapping the content to the syllabus. It is an appreciable efforts by Vedhik IAS Academy helping aspirants of UPSC Civil Services Examinations. I would like to express my sincere gratitude to Dr. Babu Sebastian, former VC - MG University in extending all support to this endeavour. Finally I also extend my thanks to thank Ms. Shilpa Sasidharan and Mr. Shahul Hameed for their assistance in the preparing the compilations.

We welcome your valuable comments so that further improvement may be made in the forthcoming material. We look forward to feedback, comments and suggestions on how to improve and add value for students. Every care has been taken to avoid typing errors and if any reader comes across any such error, the authors shall feel obliged if they are informed at their Email ID.

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At odds: Indian Prime Minister Narendra Modi and Chinese President Xi Jinping at the BRICS summit in Goa, India in 2018.

The race of two Asian giants: the story of India and China so far

There is little doubt that the actions of both China and India will determine the region in the next decade. But it is likely that they will do so in wary opposition to each other, and not as part of a wider Asian power bloc, the sort that Nehru might have imagined back in 1947.

Rana Mitter

As tensions yet again rise on the India-China border, this article dated August 15, 2022 by Rana Mitter explains how the two neighbouring countries, for better or for worse, will shape Asia in the next decade.

Last month, a United Nations population survey estimated that a milestone may be passed in 2023. For the first time in over two millennia, China will not be the most populous society on earth. Instead India will have the largest population, and China will be second.

It's a rare example of a global ranking where India sits higher than China, and it's an ambivalent victory at best: a larger population does not have merit in itself, unless it is well fed and endowed with economic prospects. China has other number 2 rankings which may raise its standing, such as the second largest economy in the world. It is not second to India but the U.S. This is a reminder of how far the two Asian giants have come since their moments of profound political change in the late 1940s: independence for India in 1947, and the victory of the Chinese Communist Party and establishment of the People's Republic of China (PRC) in 1949. In global power terms, China now looms above India, but the fluidity of geopolitics in the 2020s may give India advantages in the world now being shaped.

Different directions

The world of the late 1940s was one where global order was just as much in turmoil as in the present day. India had become the first major British colony to gain freedom, and its new leader, Jawaharlal Nehru, saw the fate of India as important not only for his country's own people but also for the other, still-colonised peoples of Asia. Although the violence of Partition cast a bloody cloud across the landscape, the

electoral democracy with a free media was a foundation stone of the secular politics that Nehru embodied, and warned an independent India to represent. China's fate at that time was also marked by violence, but it had a very different result. China had fought Japan from 1937 to 1945 during World War II, but was then plunged into a civil war between the ruling Nationalists of Chiang Kai-shek and the Communists under Mao Zedong. Mao's victory saw the establishment of the PRC, which leaned heavily on the Soviet Union for its economic model. China was kept out of the United Nations for another two decades, and did not open diplomatic relations with the U.S. for three. The years of Mao's rule saw immense domestic turmoil, with events such as the Great Leap Forward of 1958-62, an experiment in self-sufficient socialism that went horrifically wrong and starved millions of farmers to death, as well as the Cultural Revolution of 1966-76, in which China went to war with itself. Mao's China also, of course, went to war with India, in a border conflict in 1962 whose after-effects are still very evident today.

Common concerns

Yet, in the later years, the thawing of the Cold War saw both countries change path, and even share some common concerns. By the 1990s, India's highly protected economy was producing limited growth, and controversial reforms under figures including P.V. Narasimha Rao opened up the economy in various ways, creating a new class of millionaires as well as increasing inequality. In a sense, China had been there first, with the astonishing economic experiment begun in the 1970s with the blessing of Mao's ultimate successor, Deng Xiaoping. Instead of the command economy that Mao had favoured, China's senior leader allowed the development of a market economy. This did not follow the model pioneered by Ronald Reagan, Margaret Thatcher, and Bob Hawke, of removing

the workings of the market. Instead, the Chinese private sector was given space to develop within a framework controlled by the party. But it worked astonishingly well. China became a manufacturing hub for the world, regularly posting 10% growth rates in the late 1990s and early 2000s. Today, China's per capita GDP rate is around \$9,000 a year, as opposed to around \$2,000 for India.

Today, geopolitical tensions mean that China and India mostly sit on opposite ends on major global questions. There are some areas of commonality, to be fair; both are nervous about climate change commitments that may hamper their growth, and both abstained at the United Nations this year rather than condemning Russia's invasion of Ukraine.

Lessons to be learned

Yet there are also elements behind their rise that mean that both sides can learn from each other. One of China's most powerful engines for growth has been its stress on education: 2.4% of GDP goes on research and development broadly defined, and in international university rankings, which mostly rate hard sciences, China has a group of institutions in the top tier, many more than India. Education is not evenly distributed, with urban centres obtaining much more of the pie than the children of the countryside. Yet, there is no doubt that China's stress on building human capital has had results.

However, China's current political system runs the risk of losing its gains as it becomes narrower and more authoritarian. In the last few years, technology entrepreneurs, academics and lawyers have all become victims of political crackdowns by the party, which is concerned about any voices that do not simply follow the line sent down by Beijing. However, societies that suppress questioning voices find, in time, that their capacity to innovate is damaged. India has long had a pluralist system with a variety of voices, the flexibility and

provide should give both China and India pause for thought if neither wants to fall behind in the next stage of global development.

Challenges ahead

The 2020s will provide a set of challenges for both India and China. On the international stage, both countries need to think where they can find new friends. In the case of India, there are plenty of suitors, as the establishment of the Quad naval agreement with the U.S., Australia, and Japan suggests. Yet independent India has always been reluctant to become too entangled in disputes beyond its borders. The growing strength of China has become a source of alarm for India, but it is not yet obvious that New Delhi wants to accept the invitations of the U.S. to become a full-blown ally against Beijing, nor what New Delhi's reaction would be, say, to a Chinese attempt to take Taiwan in the near future. China is likewise wary of formal alliances, but that is in part because its potential partners are ambivalent ones. Russia and China declared a "friendship without limits" in February this year, but it seems unlikely that Russian President Vladimir Putin shared the full extent of his ambition to invade Ukraine with Chinese President Xi Jinping when he met him at the Winter Olympics.

There is little doubt that the actions of both China and India will shape Asia in the next decade. But it is likely that they will continue to do so in wary opposition to each other, and not as part of a wider Asian power bloc of the sort that Nehru might have imagined back in 1947, even if they continue to remain the first and second most populous societies on earth in whichever order.

The 2020s will provide a set of challenges for both India and China. On the international stage, both countries need to think where they can find new friends.

Rana Mitter is Professor of History and Politics of Modern China, University of

Building climate resilience collectively

India unveiled its long-term climate action plan at the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27), held in Sharm el-Sheikh, Egypt, in November. While the document titled 'Long-Term Low-Carbon Development Strategy (LT-LCDS)' has multi-sectoral measures to reach a net zero emissions status, climate-resilient urbanisation forms a cornerstone of the Government of India's strategy under the Paris Agreement.

This three-pronged and long-term plan for urban areas focuses on adaptation and resource efficiency in urban planning, climate-responsive and climate-resilient buildings, and municipal service delivery.

Have a data-driven approach

There are several flagship missions championed by the Ministry of Housing and Urban Affairs as well, which target specific objectives towards creating a smart, sustainable and resilient urban India. To facilitate implementation of the LT-LCDS and other missions, and enable their integration, a data-driven approach may be useful. Demonstrating urban planning strategies aimed at climate resilience through specific actions and interventions (backed by sound data) and linking them to various finance streams accessible to the urban local bodies is important.

Cities need effective and efficient planning instruments that translate master plans into transformative business-ready investment projects.

For instance, the Urban Sustainability Assessment Framework (USAF), a decision support tool of UN-Habitat for municipal commissioners and urban practitioners, supports the sustainable and resilient urban planning and management of Indian cities. It enables cities to regularly capture inter-sectoral data and corresponding analysis on urban metrics, thereby helping in monitoring the performance of a city in static and dynamic contexts. Cities can enhance vertical integration by pulling together the missions' objectives at the central level, State policies and projects, and local implementation through city-specific strategic actions linked to



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Active involvement by government, non-governmental, community-based organisations, and academic institutions will help build a sustainability profile and arrive at specific interventions

capital investment planning.

The urban transport sector is among the key contributors to greenhouse gas (GHG) emissions.

The cases of Bhopal and Jaipur

In the case of Bhopal (Madhya Pradesh), for example, they make up for 19% of the city's GHG emissions. Bhopal favours non-motorised transport (NMT) with a 43% NMT modal share but provides access to public bike docking stops to only 24% of its population; only half of its streets have footpaths. By designing 'shared streets' for personal vehicles, public transport, NMT and pedestrians, and linking them with future economic activity zones and underserved areas, the city has immense potential to reduce its carbon footprint. These streets can also be conduits for native plant species and groundwater recharge by integrating water-sensitive urban design features with a potential of reducing GHG emissions of up to 15 tCO₂/annum per kilometre. In Bhopal, the Smart Cities Mission has made significant investments in NMT, though the use of this infrastructure has been sub-optimal. There are opportunities for improvement and increased usage of the NMT network through better land use integration. Spatial analyses can inform decision-making towards co-location of investments and projects from various missions for cumulative community impact and enhanced urban value.

Nature-based solutions provide a range of solutions for climate change adaptation over hard grey infrastructure. As seen in Jaipur (Rajasthan), with only 1.42 sq.m per capita of open space against a benchmark of 12 sq.m per person, the desert capital also experiences various hazards that include heat waves, droughts and urban flooding. Residential areas with at least 10% of land area under open space and parks were found to be at least 1.25°C cooler than neighbourhoods with less green pockets. In industrial pockets, the urban heat island impact was greater with temperatures higher by 1°C. There are several macro and micro options available to Jaipur such as planting shade trees, urban forests, installing cool roofs, planting cool islands and investing in city scale blue green

infrastructure to improve the micro-climate and environmental conditions.

Jaipur has also witnessed a significant decline in porous surfaces (by 50%) in the last three decades and a corresponding sharp increase in surface stormwater run-off (256%) which the city struggles to accommodate leading to regular urban flooding. Simple yet effective solutions that can increase Jaipur's resilience include community recharge pits in neighbourhood parks, and increasing permeable spaces along mobility corridors to decrease the run-off by a sizeable fraction. Such interventions find consonance with the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) mandates and allows for cities to integrate them with their capital investment plans.

The suggested planning approach merits a comprehensive stakeholder participation towards building climate resilience. Active involvement from various tiers of government, non-governmental, community-based organisations, and academic institutions is desirable at each step – from building a sustainability profile to arriving at very specific interventions. Movements on the city performance indicators communicate the impact of these interventions to the decision-makers and the community at large. In addition, cumulative benefits and efficient use of public resources from various central and State missions, and on-ground convergence are possible by identifying neighbourhoods/wards to co-locate investments for holistic and integrated city-level transformations. This evidence-based approach aims at making cities sustainable, resilient and inclusive with no one and no place left behind.

All this is in the spirit of the Sharm el-Sheikh Implementation Plan which affirms that "sustainable and just solutions to the climate crisis must be founded on meaningful and effective social dialogue and participation of all stakeholders". Therefore, India's long-term strategy must accommodate the most vulnerable of its people in its low-emissions pathways to achieve sustainable economic growth and poverty eradication.

Specific date will be given for pleas on Article 370, says SC

The removal of special status deprived Jammu and Kashmir of privileges; the petitions have challenged a Presidential Order of August 5, 2019

The Hindu Bureau
NEW DELHI

Chief Justice of India D.Y. Chandrachud on Wednesday said a specific date will be given for hearing a series of petitions challenging the removal of special status given to Jammu and Kashmir under Article 370 of the Constitution.

“I will examine and give a date,” the Chief Justice said in response to an oral mentioning for the early listing of the case.

The last time the case was mentioned for early listing was on September 23 before the current CJI’s predecessor, Justice U.U. Lalit, who had promised that it would come up after October 10.

The Article 370 case has



The Article 370 case has been pending in the Supreme Court for over two years.

been pending in the Supreme Court for over two years. The case had not come up after a five-judge Bench refused to refer the petitions to a larger Bench in March 2020. The case had since been mentioned several times for early hearing.

The petitions have chal-

lenged a Presidential Order of August 5, 2019 which blunted Article 370.

The various petitions have challenged the Centre’s “unilateral” move to impose curfew and unravel the unique federal structure of India by dividing Jammu and Kashmir “without taking consent from the people”.

Separate petitions have contended that the August 5 Order and the Jammu and Kashmir Reorganisation Act of 2019 were arbitrary.

They have also challenged the proclamation of President’s Rule in the State in December 2018.

The petitions have said what happened to Jammu and Kashmir “goes to the heart of Indian federalism”.

RS clears Bill to move Gond community to ST list in U.P.

The Hindu Bureau

NEW DELHI

The Rajya Sabha on Wednesday passed the Constitution (Scheduled Castes and Scheduled Tribes) Order (Second Amendment) Bill that aims to move the Gond community from the Scheduled Castes list to Scheduled Tribes list in Chandauli, Kushinagar, Sant Kabir Nagar and Sant Ravidas Nagar districts of Uttar Pradesh.

The Bill was discussed at length on Tuesday, with members cutting across party lines supporting the legislation. Some members insisted on considering the addition of other communities and also conducting a caste census so that accurate data can be gathered.

Why are India's slowing exports a cause for concern?

How are other export-dominated countries faring? Why is the government optimistic that domestic demand will counter the effects of declining exports?

K. Bharat Kumar

The story so far:

India's exports declined about 16.7% in October compared with the year-earlier period. This is the first slide reported for any month since February 2021. October imports rose at a much milder pace than earlier, most likely because of softening commodity prices worldwide, and trade deficit widened by as much as 50%.

How is the export sector faring?

Engineering goods, which have lent a strong shoulder to India's goods exports in recent years, slid 28%. The Engineering Export Promotion Council of India Chairman Arun Garodia attributed the slowdown to high inflation in developed regions, falling demand in China, slowdown in the EU and the U.S. and the Russia-Ukraine war. The Commerce Ministry pointed out that for October, a decline of \$2 billion worth of exports was seen in steel and allied products, highlighting the fact that the government

had levied an export duty on these products to help increase local availability and hence temper local prices. The government has since removed this duty. The Ministry also highlighted that in the month of Diwali every year, workers tend to take leave, thus impacting output. Therefore, one should wait and see whether export decline was only a blip or whether it was a trend that would stay.

What about other exporting nations?

Vietnam, an export-dominated country, recorded a 4.3% growth in exports from a year earlier to \$29.18 billion amid 'sustained foreign demand', according to tradingeconomics.com. Similarly, exports by the Philippines grew 20% in October. The government there had said that exports rose for the first time in three months in September amid what it calls 'signs of reviving foreign demand'. China is an outlier this year because of stringent lockdowns that are impacting manufacturing output, though lockdowns are being eased currently following protests against restrictions.

Is domestic demand enough?

The monthly Finance Ministry review for October acknowledges a slowing export scenario but emphasises that domestic demand will carry through. The report states that the global slowdown is driven by a 'confluence of stubbornly high inflation, rising borrowing costs and geopolitical tensions', but cites local demand as being 'resilient'. It also expects a 're-invigorated' investment cycle which will spur growth and job creation in the coming days.

Interestingly, the Ministry says that recently, inflation has been driven up more by local factors, including higher food prices, than imported reasons and that those pressures are set to dampen thanks to easing international commodity prices and the arrival of Kharif crop. Retail inflation has been consistently above 7% these past few months, but stood at 6.8% in October). Sure enough, consumer inflation eased to 5.88% for November. In the monthly report, the Ministry also pinned hope on the fact that the last month saw the lowest sign-ons

this year for the employment guarantee scheme MGNREGS. It is hoping that a spike in tractor sales in September and October reflects improved sentiment.

One seemingly positive signal for the economy is the private sector capital expenditure which Chief Economic Adviser V. Anantha Nageswaran says is on track to touch six lakh crore this fiscal which would make it the highest of the past six years. Private capex typically depends on credit, or loans, from the banking system. And that has seen a healthy growth in the recent past touching a high of 13% last month. There have been reports of banks scrambling to gather deposits, with videos of managers and their spouses walking the streets announcing deposit rates to help mobilise funds for credit growth. Whether this credit growth is due to inflation and low base effect from last year, remains to be seen over the coming months.

What about our foreign reserves?

For the week ended December 2, foreign exchange reserves stood at about \$561 billion. If we take October imports at \$56.7 billion (an eight month low) as a benchmark, then we have roughly about 9-10 months' worth of import cover which isn't as healthy as the 14 to 15 month cover that we had seen during the pandemic. However, economists feel this isn't as bad as 2013 when foreign investors began pulling out of India's financial markets. At that time, we had less than seven months' worth of import cover. And if anything, forex reserves have been rising in recent weeks signalling hope for the future.

THE GIST

▼ India's exports declined about 16.7% in October compared with the year-earlier period. This is the first slide reported for any month since February 2021.

▼ The recently Finance Ministry review for October states that the global slowdown is driven by a 'confluence of stubbornly high inflation, rising borrowing costs and geopolitical tensions'.

▼ One seemingly positive signal for the economy is that the private sector capital expenditure is on track to touch six lakh crore this fiscal.

Centre to take measures to further help slow inflation, says Sitharaman

FM says inflation rate will be brought down further for the sake of the common people, after it eased to an 11-month low of 5.88% in November; stresses there is no fear of 'stagflation' and that government is committed to path of fiscal consolidation

The Hindu Bureau
NEW DELHI

Finance Minister Nirmala Sitharaman on Wednesday assured the Lok Sabha that the Centre would be taking measures to further help ease inflation, which has dipped below the Reserve Bank of India's upper tolerance level of 6%. Retail inflation slowed to an 11-month low of 5.88% in November from 6.77% in the previous month.

"We will bring [it] down further for the sake of com-

Macro indicators

Retail inflation moderated to an 11-month low of 5.8% in November from 6.77% in the previous month



- FM says government is watching the price situation of essential commodities
- Rural jobs scheme seeing declining trend, she points out
- Govt. will be able to meet 6.4% fiscal deficit target for FY23, she assures Parliament

mon people," the Finance Minister said, while replying to a discussion on the first batch of Supplemen-

tary Demands for Grants 2022-23 in the Lok Sabha.

Later, the House passed the Supplementary De-

mands for Grants, authorising the Centre to spend an additional ₹3.25 lakh crore in 2022-23. The government is constantly watching the price situation of essential commodities, she said. Ms. Sitharaman made it clear that there was no fear of stagflation, as 'India is one of the fastest growing economies with low inflation levels'.

MGNREGA demand dips

She also said the government was noticing a trend of decline in demand for employment under the

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme. The Minister said the government would be able to meet the fiscal deficit target of 6.4% of GDP for FY23. The government is committed to the path of fiscal consolidation, the Minister added.

On the rupee, she said the domestic unit was appreciating against all other currencies, adding that the rupee's fall against the U.S. dollar was low compared with the weakening in other currencies.

Ind-Ra sees Q2 CAD at 37-quarter high of 4.4%

Press Trust of India

MUMBAI

Falling exports and high crude prices are set to push up the current account deficit (CAD) in the second quarter to a 37-quarter high of 4.4% of GDP at \$36 billion as against \$9.7 billion or 1.3% in the year-earlier period, according to India Ratings (Ind-Ra).

The agency said it expected merchandise exports to slip to an 8-quarter low of \$88.2 billion in Q3, which would be 17.4% lower from a year earlier.

India said to buy Russian crude well below \$60 price cap

Reuters

NEW DELHI

Russia's flagship Urals crude has been sold at deeper discounts this month following a European ban on Russian oil imports, and dominant buyer India has bought barrels at well below a \$60 price cap, four market sources said.

On December 5, the Group of Seven implemented a \$60 price cap on Russian seaborne oil to try to limit Moscow's ability to fund its war in Ukraine.

For some deals this



month, the price for Urals in Indian ports, including insurance and delivery by ship, has fallen to about minus \$12-\$15 per barrel versus a monthly average of dated Brent, down from a discount of \$5-\$8 per barrel in October.

Need for fiscal prudence in implementing PFMS: panel

The Hindu Bureau

NEW DELHI

The Public Accounts Committee (PAC), in its 54th report on “Implementation of Public Financial Management System (PFMS)”, stressed fiscal prudence in financial planning by incorporating scientific methods into budgeting, projecting and utilisation of funds.

Noting that the actual budgeting and year-to-year phasing of expenditure varied from the plan approved by the government, the committee observed in its report presented on Wednesday that the tasks related to the implementation of the PFMS appeared to have been dealt with a casual approach and there was no proper financial planning of the process.

The committee held the view that incorporating scientific methods into budgeting, projecting and utilisation of funds would have ensured maintenance of fiscal prudence.

Wholesale price inflation fell to 5.85% in November

Vikas Dhoot

NEW DELHI

India's wholesale price inflation fell sharply to 5.85% in November from 8.4% in October, thanks to a broad-based dip in price rise led by food items whose inflation slipped from 6.5% in October to just 2.2%.

Inflation in primary articles at the wholesale level halved from 11% in October to 5.5% in November, while manufactured products saw price rise easing from 4.4% to 3.6% over the same period.

Fuel and power inflation dropped to 17.35% in November, nearly half the 33.1% recorded in September and lower than October's 23.2% level.

Wholesale price inflation had slipped below 10% for the first time in 19 months in October.

CONTINUED ON

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Wholesale price rise fell to 5.85% in November

The Commerce and Industry Ministry said the decline in inflation this November is 'primarily contributed by fall in prices of food articles, basic metals, textiles, chemicals & chemical products and paper & paper products' compared to November 2021.

The high base effect from a year ago also played a role, as wholesale inflation stood at 14.87% in November 2021, but this is the sixth successive month of moderation in wholesale inflation since it hit a record peak of 16.63% in May. Retail inflation also cooled in November to an 11-month low of 5.88% from a nearly eight-year high of 7.8% in April, driven by an over 8% deflation in vegetable prices.

At the wholesale level, vegetables recorded a deflation of 20.1% in November compared to a 17.6% inflation in October, as per official data, with onions recording a 19.2% fall in prices and fruits reported deflation of 1.1%, from a year ago. Potato inflation moderated significantly to 13.75% in November from 45% in October and 49.8% in September.

However, some key food items saw an acceleration in wholesale inflation, similar to the uptick in retail prices, with cereals inflation rising to 12.85% from 12% in October and wheat inflation nudging up from 16.25% in October to 18.11% in November.

Energy conundrum

Solar power is important for India, but it will not serve every energy need

At the core of India's energy transformation is its bet on solar power. Based on a commitment to address the global climate crisis, India has promised to source nearly half its energy from non-fossil fuel sources by 2030 and, in the shorter term, source at least 60% of its renewable energy from solar power. However, a disclosure in Parliament by the Minister for Power, New and Renewable Energy suggests that India faces significant headwind in this quest. A key central policy to source solar power is facilitating the establishment of large solar parks; small solar power projects usually translate to higher per-unit production costs. And so, in 2014, the Centre announced the 'Solar Parks and Ultra-Mega Solar Power Projects' policy to facilitate the creation of large parks. The initial plan was to set up 25 parks capable of generating at least 20,000 MW by 2019. In 2017, the Government scaled this to 61 parks with a target of 40,000 MW. It emerges, however, as of 2022, that only a fourth of the capacity has been achieved, that is, projects worth 10,000 MW have been commissioned. Four projects have been cancelled, by the Centre's own admission, due to tardy progress. The roadblocks, in the Centre's estimate, have been challenges in acquiring land with a clear title, setting up infrastructure necessary to transmit power produced at these parks to the grid and, in an unusual disclosure, "environmental issues" in Rajasthan and Gujarat, where projects have been halted because their transmission lines encroach upon the habitat of the critically endangered Great Indian Bustard.

Notwithstanding its claims on international podia that it is on track to meeting renewable energy targets, it is no secret that India is lagging behind. By the end of 2022, India had committed to having in place 1,75,000 MW of renewable energy capacity, with 1,00,000 MW from solar power. However, only around 61,000 MW of such capacity has actually been installed. For a few years now, there has been considerable hype around solar power achieving grid parity in India – meaning power companies are able to sell it at a price lower or as much as conventional sources – but this does not account for the subsidies or concessions front-loaded by the Government. While India should continue to expand its economy on the back of renewable energy, the Government must take a hard look at whether renewable power, solar, wind or nuclear, meets standards of economic viability and environmental sustainability. Solar power may be a valuable tool in India's energy transformation story, but it cannot be the panacea for every need.

How gene therapy could cure cancer

Who led the trial for this form of experimental medicine? How does base editing help in curing cancerous T-cells? How does the CRISPR-cas9 system work? Was the treatment a complete success? Does base editing treat blood disorders as well?

EXPLAINER

Jacob Kohly

The story so far:

Scientists in the United Kingdom testing a new form of cancer therapy, reported success in a teenage girl, Alyssa, with a form of cancer called T-cell acute lymphoblastic leukaemia.

What happens in this form of cancer?

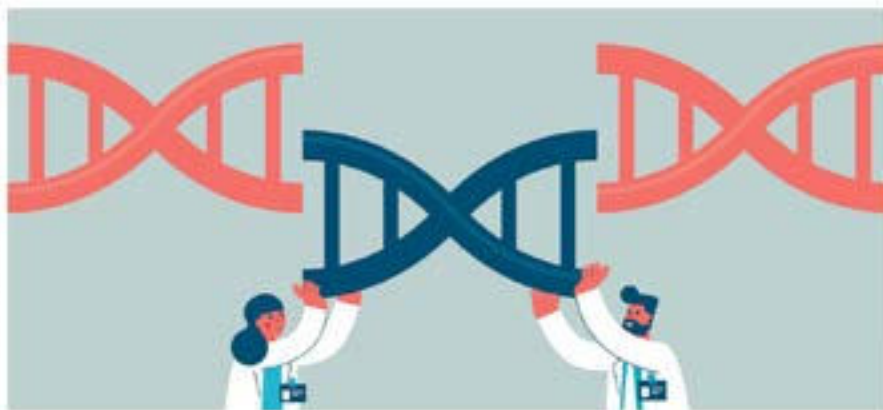
In this form of blood cancer, the T-cells, which are a class of white blood cells, equipped to hunt and neutralise threats to the body, turn against the body and end up destroying healthy cells that normally help with immunity. The disease is rapid and progressive and is usually treated by chemotherapy and radiation therapy.

What marked Alyssa's treatment?

The BBC reported that Alyssa, 13, tried several of the standard treatments including chemotherapy and radiation but with limited success. Just when it seemed there was no hope, she was enrolled in the trial testing of an experimental medicine. This trial was led by doctors and scientists at the University College, London and Great Ormond Street hospital. Alyssa was the first to receive experimental gene therapy that relied on a new technique called 'base editing'.

What is 'base editing'?

A person's genetic code is several permutations of four bases: Adenine (A), Guanine (G), cytosine (C) and thymine (T). Sequences of these bases, akin to letters in the alphabet, spell out genes that are instructions to produce the wide array of proteins necessary for the body's functions. In Alyssa's case, her T-cells – perhaps because of a mis-arrangement in the



sequence of bases – had become cancerous. A way to correct this mis-arrangement could mean a healthier immune system. In the last two decades, the world of biomedical engineering has been enthused by a technique that allows genes to be altered and errors fixed. The most popular among these approaches has been the CRISPR-cas9 system.

Inspired by how certain bacteria defend themselves against viruses, by stripping out and storing pieces of their genes, the CRISPR-cas 9 system, consists of an enzyme that acts like molecular scissors. It can be made to cut a piece of DNA at a precise location and a guide RNA can be used to insert a changed genetic code at the sites of incision. While there are a few ways to effect such changes, the CRISPR-cas9 system is believed to be the fast, most versatile system to effect such gene editing. David Liu, of the Broad Institute, Mas-

sachusetts has improvised on the CRISPR-cas9 system to be able to directly change certain bases: thus, a C can be changed into a G and T into an A.

While still a nascent technology, base editing is reportedly more effective at treating blood disorders which are caused by so-called single point mutations, or when a change in a single base pair can cause terminal disease.

How did base-editing work for Alyssa's therapy?

The objective of the gene therapy in the case of T-cell leukaemia was to fix her immune system in a way that it stops making cancerous T-cells. First, healthy T-cells were extracted from a donor and put through a series of edits. The first base edit blocked the T-cells targeting mechanism so it would cease attacking Alyssa's body, the second removed a chemical marking,

called CD7, which is on all T-cells and the third prevented the cells being killed by a chemotherapy drug. Finally, the T-cells were programmed to destroy all cells – cancerous or protective – with CD7 marked on it. After spending a month in remission, she was given a second donor transplant to regrow her immune system that would contain healthy T-cells.

How effective was the treatment?

Three months after the treatment, her cancer seemed to resurface but the most recent investigations suggest no signs of it, according to the BBC. Alyssa was one of 10 people enrolled in the trial to receive the treatment.

It has been 1.5 years since she was first diagnosed with the disease and whether the treatment has reliably and entirely fixed her immune system, remains to be established.

THE GIST

Scientists in the United Kingdom testing a new form of cancer therapy, reported success in a teenage girl, Alyssa, who has T-cell acute lymphoblastic leukaemia. Alyssa was the first to receive experimental gene therapy that relied on a new technique called 'base editing'.

The objective of the therapy in the case of T-cell leukaemia was to fix her immune system in a way that it stops making cancerous T-cells.

Three months after the treatment, her cancer seemed to resurface but the most recent investigations suggest no signs of it, according to the BBC.

ILLUSTRATION

Understanding the fusion energy breakthrough announced by the U.S.

EXPLAINER

Vandevan Mukesh
BENGALURU

United States government officials announced on Tuesday that a federal facility had achieved a critical milestone in nuclear fusion research. Energy secretary Jennifer Granholm said the feat puts us on the path to "non-carbon abundant fusion energy powering our society."

Officials said the National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory (LLNL), California, had conducted a fusion test on December 1 that produced 15% as much energy as went into triggering it.

The NIF uses powerful lasers to heat and compress hydrogen nuclei. When the nuclei fuse, they release heat. When this heat is equal to or greater than the heat delivered to

the container, the event is called ignition. The ratio of the output energy to the input delivered to the container is the gain.

In 2021, the NIF reported that it had achieved a gain of 0.72. Now, it has reportedly achieved ignition with a gain of 1.53 with a yield of 3 megajoules. "The recent results from the NIF are a major achievement on the road to fusion energy," Matthew Zepf, professor at the Friedrich Schiller University Jena and a director of the Helmholtz Institute Jena, said.

Inertial confinement
Magnetic confinement and inertial confinement are two popular ways to achieve nuclear fusion. Magnetic confinement uses tokamak reactors in which a hydrogen plasma is heated to a high temperature and the nuclei are guided by strong magnetic fields to fuse. Its corresponding technology is con-

sidered to be more technologically mature than that of inertial confinement.

In the NIF's setup, 60 high-power lasers fire pulses at a 2-mm-wide capsule inside a 1-m-long cylinder called a hohlraum, in less than 10 billionths of a second. The capsule holds deuterium and tritium atoms. As the pulses strike the hohlraum's interior, the latter heats up and releases X-rays, which heat the nuclei to millions of kelvins and compress them to billions of Earth atmospheres.

The high temperature is required to energise the nuclei to overcome their mutual like-charges-repel repulsion. The technique is called inertial confinement because the nuclei's inertia creates a short window between implosion and explosion in which nuclear forces dominate, fusing the nuclei.

When two hydrogen-2 nuclei fuse, they yield a he-



The NIF uses 192 laser beams converging at the centre of this giant sphere to make a tiny hydrogen fuel pellet implode.

lium-4 nucleus, a neutron and 17.6 MeV of energy according to the mass-energy equivalence.

'Burning plasma'

For a fusion chain reaction, the energy released by the initial reaction needs to set the stage for more reactions. To this end, the NIF's goal has been to create a "burning plasma" when nuclei are encouraged to fuse not by the external heat source

but by the heat of other reactions.

The NIF achieved this in 2021 with a gain of 0.72. 1.37 megajoules produced by the fusing nuclei versus 1.07 megajoules delivered by the lasers.

In August 2022, the facility reported it had produced a burning plasma that met the Lawson criterion: the heat generated was sufficient to potentially trigger other fusion reactions as well as offset heat

loss during the reaction. Now, the facility has reportedly achieved a burning plasma that meets the Lawson criterion as well as a gain greater than 1.

Caveats

The NIF's is a significant scientific achievement – but where energy is concerned, the important question is: what does it imply for practicable fusion?

After the NIF achieved a gain of 0.72 in 2021, the people in charge of the experiment tried thrice to repeat their feat. They failed – because the NIF fusion facility is a highly sophisticated system with tiny moving parts. Even small changes in input conditions, like microscopic bumps on the capsule, can lead to large variations in output.

So the NIF will need to reproduce its new results.

Second: For fusion to be truly useful, the energy re-

leased by the reactions needs to be greater than the energy going into the lasers, about 300 megajoules, and not just the energy delivered to the hohlraum. This hasn't yet been achieved.

"The energy transferred to the plasma is just about 1%, the rest is all lost in other processes," said Shihui Dengpande, a professor at the Institute for Plasma Research, Gandhinagar.

Next milestones

"Future research will need to focus on reaching the next major milestone – a target gain of $G > 100$, which is required to run a power plant efficiently," according to Matthew Zepf, professor at the Friedrich Schiller University Jena and a director of the Helmholtz Institute Jena, said.

That is, if the lasers deposit 2 megajoules, the reactions in a power plant will have to produce at least 200 megajoules to be

feasible. And "even if one were to achieve high gain," Mr. Dengpande said, "Questions about how often one can repeat the pulse, to get sustained power, and couple a higher fraction of the initial energy investment to the fuel will be crucial in future," he added.

Third: The road to a power plant from the NIF's current achievement isn't well understood.

For example, at the NIF, lasers fire at a hohlraum, generating X-rays that heat the capsule – instead of hitting the capsule directly. This prevents the laser pulses from being pinpoint accurate and allows the capsule to be heated in a symmetric way, which is highly desirable. But the cost is lower gain.

"It wouldn't be possible to set a timeline" about a power plant, Mr. Dengpande said, "as the scientific understanding is still evolving."

Geographical Indication tag sought for Kerala's legendary Beypore *Uru*

Sangeetha Kandavel
CHENNAI

The District Tourism Promotion Council, Kozhikode has applied for a Geographical Indication (GI) tag for the famous Beypore *Uru* (boat).

It is a wooden dhow (ship / sailing boat / sailing vessel) handcrafted by skilled artisans and carpenters in Beypore, Kerala. According to details provided by the District Tourism Promotion Council in



Urus are made of wood without using any modern techniques. SPECIAL ARRANGEMENT

its filing with the Geographical Indications Re-

gistry here in Chennai, the Beypore *Urus* are a symbol of Kerala's trade relations and friendship with the Gulf countries.

The *Urus* are purely made of premium wood, without using any modern techniques. The wood used to build the *Uru* is still sawed the traditional way which requires immense expertise. It takes one to four years to build each *Uru* and the entire process is done manually, said IPR Attorney P. Sanjai Gandhi,

who filed the application.

Today, many artisans involved in *Uru*-making are over 50-70 years old and have been in the profession since their fathers passed on the tradition to them.

Records quoted in the filing show that Beypore has been a legendary maritime hub for traders from across the world since the 1st Century C.E. and the iconic *Uru* ships have been in high demand for around 2,000 years.

‘Mumbai to experience ‘poor’ to ‘very poor’ AQI in coming years’

The Hindu Bureau

MUMBAI

Experts have warned that Mumbai is likely to experience an increasing number of days with ‘poor’ and ‘very poor’ air quality in the coming years during winter months, but Mumbai’s air pollution is likely to see a dip in the coming days after the wind speed is expected to pick up after cyclone Mandous.

The Air Quality Index (AQI) data for Mumbai from November 1 to December 10, 2022, recorded using the System of Air Quality Weather Forecasting and Research (SAFAR) mobile application shows Malad, Chembur, and Mazgaon were the three most polluted areas.

The analysis of the prevailing poor air quality in Mumbai by SAFAR shows that emission levels from industries may not be the single factor responsible for poor air quality during November and December 2022.

Dr. Gufran Beig, founder and project director, SAFAR said, “The visibility across Mumbai has taken a hit. This means that both fine and coarse particulate matter is high in Mumbai’s air. If industries or refineries are the major sources of air pollution, then only the fine particulate matter or PM2.5 would have been high. Thus, it is construction dust which has led to an increase in PM2.5 and PM10, worsening Mumbai’s air quality.”

NSCS has prepared draft cybersecurity strategy: govt.

The Hindu Bureau

NEW DELHI

The National Security Council Secretariat (NSCS) has formulated a draft National Cyber Security Strategy, which holistically looks at the issue of security of national cyberspace, the government said in the Lok Sabha on Wednesday.

Responding to a query from Lok Sabha members Rajveer Singh and Sukanta Majumdar raised in the wake of recent cyberattacks, Minister for Electronics and Information Technology Ashwini Vaishnaw said in a written reply the NSCS had formulated a draft strategy. However, the timeline for its implementation and other details were not mentioned.

Warning sign

India cannot wish away the situation on the China border by staying silent

Another attempted transgression by the Chinese military, this time in the Tawang sector in the eastern section of the India-China boundary, has served a reminder of the precarious state of affairs along the Line of Actual Control (LAC). A crisis which began in April 2020, with PLA transgressions in Ladakh, in the western sector of the boundary, has now appeared to have widened to Arunachal Pradesh. Defence Minister Rajnath Singh said in Parliament that the Indian Army had forced the PLA to return to its posts. The Minister's comments, on December 13, came four days after the incident, details of which were first reported by *The Hindu* on December 12. An Army statement confirmed the clash. The Opposition, which has criticised the Narendra Modi government's continuing reticence on the China border issue, staged a walk-out after being denied a discussion.

As troubles now flare in Arunachal, the situation in Ladakh still remains unresolved. India is yet to resume patrolling in any of the five disengagement areas where temporary buffer zones have been established, while the Chinese military remains on India's side of the LAC in two other friction points, in Depsang and Demchok. What is clear is that the Chinese military has decided, for reasons still unexplained, to unilaterally change how both sides manage what were previously mutually recognised disputed areas. Managing what has become a live border after three decades of relative peace, and crafting a *modus vivendi* with China in this new situation, has now emerged as a pressing challenge for New Delhi. This is both a military and a political challenge. Addressing it will require, as a first step, transparency, and taking the Opposition and public along on an issue far too important to be led by apparent considerations over optics. Those considerations also appear to be one factor behind the continuing freeze in high-level political contact with China, with Prime Minister Modi and President Xi Jinping avoiding a formal meeting at two recent multilateral summits. That the leaders have not spoken for more than three years, barring an exchange of pleasantries at the G20 summit, is an untenable situation as risks continue to rise along the borders. A resumption of dialogue will, at the very least, allow India to convey its concerns at the highest level. The public also remains largely in the dark on the events that have transpired along the borders, as well as the developments that led to the loss of life of 20 Indian soldiers, in 2020. If the Government's apparent hope was to maintain a silence until the crisis resolves in due course, the latest clash has served a warning sign that it is nowhere near ending.

General Studies Paper I	
A	History of Indian culture will cover the salient aspects of art forms, literature and architecture from ancient to modern times;
B	Modern Indian history from about the middle of the eighteenth century until the present-significant events, personalities, issues;
C	Freedom struggle-its various stages and important contributors / contributions from different parts of the country;
D	Post-independence consolidation and reorganization within the country;
E	History of the world will include events from 18 th century such as industrial revolution, world wars, re-drawal of national boundaries, colonization, decolonization,
F	Political philosophies like communism, capitalism, socialism etc.-their forms and effect on the society
G	Salient features of Indian Society, Diversity of India;
H	Effects of globalization on Indian society;
I	Role of women and women's organization;
J	Social empowerment, communalism, regionalism & secularism
K	Salient features of world's physical geography;
L	Geographical features and their location- changes in critical geographical features (including water bodies and ice-caps) and in flora and fauna and the effects of such changes;
M	Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc.
N	Distribution of key natural resources across the world (including South Asia and the Indian subcontinent);
O	Factors responsible for the location of primary, secondary, and tertiary sector industries in various parts of the world (including India);
P	Population and associated issues;
Q	Urbanization, their problems and their remedies
General Studies Paper II	
A	India and its neighbourhood- relations;
B	Important International institutions, agencies and fora- their structure, mandate;
C	Effect of policies and politics of developed and developing countries on India's interests;
D	Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.
E	Indian Constitution, historical underpinnings, evolution, features, amendments, significant provisions and basic structure;
F	Comparison of the Indian Constitutional scheme with other countries;
G	Functions and responsibilities of the Union and the States, issues and challenges pertaining to the federal structure, devolution of powers and finances up to local levels and challenges therein; Inclusive growth and issues arising from it;
H	Parliament and State Legislatures - structure, functioning, conduct of business, powers & privileges and issues arising out of these;
I	Structure, organization and functioning of the executive and the judiciary, Ministries and Departments;

J	Separation of powers between various organs dispute redressal mechanisms and institutions;
K	Appointment to various Constitutional posts, powers, functions and responsibilities of various Constitutional bodies;
L	Statutory, regulatory and various quasi-judicial bodies;
M	Mechanisms, laws, institutions and bodies constituted for the protection and betterment of these vulnerable sections;
N	Salient features of the Representation of People's Act;
O	Important aspects of governance, transparency and accountability, e-governance- applications, models, successes, limitations, and potential;
P	Citizens charters, transparency & accountability and institutional and other measures;
Q	Issues relating to poverty and hunger,
R	Welfare schemes for vulnerable sections of the population by the Centre and States, Performance of these schemes;
S	Issues relating to development and management of social sector / services relating to education and human resources;
T	Issues relating to development and management of social sector / services relating to health
General Studies Paper III	
A	Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment;
B	Effects of liberalization on the economy, changes in industrial policy and their effects on industrial growth;
C	Inclusive growth and issues arising from it;
D	Infrastructure Energy, Ports, Roads, Airports, Railways etc. Government budgeting;
E	Land reforms in India
F	Major crops, cropping patterns in various parts of the country, different types of irrigation and irrigation systems;
G	Storage, transport and marketing of agricultural produce and issues and related constraints;
H	e-technology in the aid of farmers; Technology Missions; Economics of Animal-Rearing.
I	Issues of buffer stocks and food security, Public Distribution System- objectives, functioning, limitations, revamping;
J	Food processing and related industries in India – scope and significance, location, upstream and downstream requirements, supply chain management;
K	Issues related to direct and indirect farm subsidies and minimum support prices
L	Awareness in the fields of IT, Space, Computers, robotics, nano-technology, bio-technology;
M	Indigenization of technology and developing new technology;
N	Developments and their applications and effects in everyday life;
O	Issues relating to intellectual property rights
P	Conservation, environmental pollution and degradation, environmental impact assessment
Q	Disaster and disaster management
R	Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security;
S	Money-laundering and its prevention;

T	Various forces and their mandate;
U	Security challenges and their management in border areas;
V	Linkages of organized crime with terrorism;
W	Role of external state and non-state actors in creating challenges to internal security;
X	Linkages between development and spread of extremism.
General Studies Paper IV	
A	Ethics and Human Interface: Essence, determinants and consequences of Ethics in human actions;
B	Dimensions of ethics;
C	Ethics in private and public relationships. Human Values - lessons from the lives and teachings of great leaders, reformers and administrators;
D	Role of family, society and educational institutions in inculcating values.
E	Attitude: Content, structure, function; its influence and relation with thought and behaviour;
F	Moral and political attitudes;
G	Social influence and persuasion.
H	Aptitude and foundational values for Civil Service , integrity, impartiality and non-partisanship, objectivity, dedication to public service, empathy, tolerance and compassion towards the weaker sections.
I	Emotional intelligence-concepts, and their utilities and application in administration and governance.
J	Contributions of moral thinkers and philosophers from India and world.
K	Public/Civil service values and Ethics in Public administration: Status and problems;
L	Ethical concerns and dilemmas in government and private institutions;
M	Laws, rules, regulations and conscience as
N	sources of ethical guidance;
O	Accountability and ethical governance; strengthening of ethical and moral values in governance; ethical issues in international relations and funding;
P	Corporate governance.
Q	Probity in Governance: Concept of public service;
R	Philosophical basis of governance and probity;
S	Information sharing and transparency in government, Right to Information, Codes of Ethics, Codes of Conduct, Citizen's Charters, Work culture, Quality of service delivery, Utilization of public funds, challenges of corruption.
T	Case Studies on above issues.