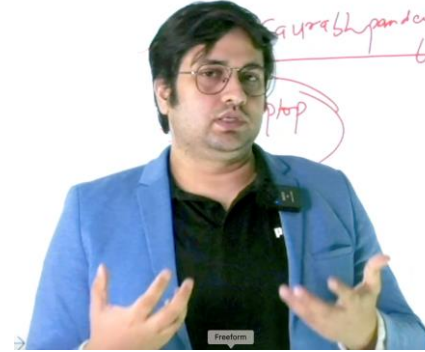


Topics

- Tinzaparin
- Barbiturates,
- Flooding and fossils
- What is the history between China and Taiwan?
- Taung Kalat
- Russia and china cooperation in Arctic
- The Polavaram Project
- long-term and short-term capital gains (STCG) tax
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- Mains



By saurabh Pandey



THE HINDU

Target Mains -2024/25 -

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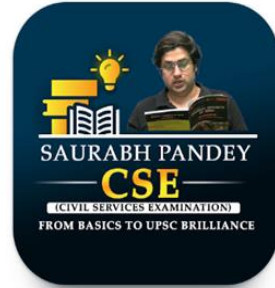
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**BY SAURABH
PANDEY SIR**

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Drug used to treat clots can protect against cobra venom damage

Researchers found tinzaparin, a drug commonly used to prevent blood clots, significantly reduced damage to human cells caused by spitting cobra venom; the team also found the drug reduced skin damage in mice injected with the venom; the scientists have filed for a patent and may start human clinical trials soon

Sayantan Datta

Range-red in colour and native to Tanzania, the *Naja palliata* – the red-spitting cobra – is a formidable, 1.2-metre-long foe. When threatened, it raises its hood and hisses loudly. If this display doesn't deter its predator, it will use its most potent weapon, its venom. Muscles around the snake's venom glands squeeze, releasing jets of venom onto the eyes, nose, and mouth of the threat. As the victim's face sears in pain, the cobra takes the opportunity to lunge forward and bite, delivering a massive quantity of venom into the victim's body.

The venom attacks cells in the body and damages the nervous system. For most of the cobra's regular victims – toads, frogs, birds, and other snakes – the only fate is death. A lucky human might be spared, but with a permanent disability.

Bad deal on antivenoms

Encounters with venomous snakes kill about 1.4 lakh people every year, especially in the tropical regions of Africa and Asia. Despite this alarming number, the treatment for snakebites has remained archaic.

Based on the work of French scientists in the late 1800s, antivenom is made today by injecting domestic animals like horses and sheep with small amounts of snake venom. This ticks the animal's immune system into action, producing antibodies to neutralise the venom. Researchers extract these antibodies from the animal's blood and transport them in cold storage to hospitals, where they are injected into the bodies of snakebite victims.

Difficulties in production, storage, transportation, and administration aside, antivenoms are also expensive and can have severe side effects in humans; some of them could be fatal.

That may soon change. In a July 2024 study published in the journal *Science Translational Medicine*, a team of Australian, British, Canadian, and Costa Rican scientists reported that tinzaparin, a drug commonly used to prevent blood clots, significantly reduces damage to cells due to spitting cobra venom. The team also found the drug could reduce skin damage in mice injected with the venom.

According to a press release, the scientists have filed for a patent and may start human clinical trials soon.

According to Kartik Sunagar, an associate professor at the Centre for Ecological Sciences, Indian Institute of Science (IISc), Bengaluru, who studies the evolution of snake venoms, "This



Dealing with snakes is a tricky business. Even more dangerous is the task of rearing poisonous reptiles and extracting their venom for medical research. Here, Romulus Whitaker holds a cobra while puncturing a rubber sheet stretched over a cup with its fangs. THE HINDU ARCHIVES

discovery could pave the way for a real-world solution for regions that suffer the highest burden of snakebite morbidity."

How venom kills cells

The venom of the red and the black-necked spitting cobras – the two species whose venom the researchers used in the study – is "poorly understood," R.N.V. Krishna Deepak, who studies snake venoms using computational methods at Azim Premji University, Bengaluru, said.

Our understanding of how these venoms kill human cells is worse, which contributes to the lack of advances in antivenom development.

To address this issue, the researchers first investigated how spitting cobra venom affects human cells. They grew a collection of human cells in the laboratory that had a single gene removed. (They used CRISPR-Cas9, a Nobel-winning genome-editing tool, to build this collection.) When this gene was knocked out, cells that used the genome couldn't manufacture a particular protein – a protein researchers suspected was involved in cells being damaged.

The researchers then treated the cells with the venom of either of the two snakes and selected those that survived. Given that this resistance to spitting cobra venom had been conferred by the absence of a gene, the authors concluded the said genes were involved in facilitating the venom's effects on normal human cells.

Further investigation revealed that



The venom attacks cells in the body and damages the nervous system. For most of the cobra's victims – toads, frogs, and other snakes – the only fate is death. A human might survive, but with permanent disability

many of these genes were involved in the synthesis of a sugar compound called heparan sulphate, which is known to regulate the formation of blood vessels and clots in the human body.

Blood thinner to antidote

The researchers hypothesised that if the venom's toxicity depended on the biological pathway that synthesised heparan sulphate, artificially stopping this pathway could ameliorate the venom's toxic effects.

One way of doing so is to introduce molecules that closely resemble heparan sulphate. As the body senses an excess of these molecules, it shuts down the pathways responsible for heparan sulphate synthesis. One such molecule is tinzaparin, a drug used to treat serious blood clots.

When the team introduced tinzaparin immediately after subjecting cells to the snake venom, the cells survived. Tinzaparin could protect these cells even when it was introduced an hour after the cells had been exposed to the venom. Further experiments revealed that tinzaparin worked by blocking the

interaction between the venom and its receptor in the cell by binding to venom molecules.

When the researchers injected mice with venom from either of the two cobras along with tinzaparin, they found that skin damage resulting from the venom was much less when the mice were provided with the drug versus when they were deprived of it.

'Hiding right under our noses'

Dr. Deepak said the study's use of the "mighty but neglected problem" could potentially renew the global scientific community's interest in understanding mechanisms underlying snake venom toxicity.

IISc venomologist Dr. Sunagar added that the study is "one of the few research undertakings where the molecular mechanism of how venom causes damage is taken into account to design a targeted therapy." The therapeutic agent itself that the study proposes – tinzaparin – is inexpensive, widely available, and has been "hiding right under our noses", Dr. Deepak said. He added that he is excited to see how different research groups follow up on the study's findings. In the meantime, he hoped the study would garner enough attention to make a case for increased funding that will allow researchers to employ "advanced methods like CRISPR-Cas9 to address snakebite envenoming."

(Sayantan Datta is a science journalist and a faculty member at Krea University. The author tweets at @queersprings.)

THE GIST

Venomous snakes kill about 1.4 lakh people every year, especially in Africa and Asia. Despite this, treatment for snakebites has remained archaic and is still based on the work of French scientists in the late 1800s.

Researchers grew human cells that had a gene removed. These cells now couldn't manufacture a particular protein. The cells were treated with venom and those that survived were selected. The authors concluded the said gene facilitated the venom's effects.

This gene is involved in the synthesis of heparan sulphate, which regulates blood vessels. Introducing molecules that resembled heparan sulphate led the body to shut down pathways responsible for heparan sulphate synthesis. One such molecule is tinzaparin.

Tinzaparin

- In a July 2024 study published in the journal **Science Translational Medicine**, a team of Australian, British, Canadian, and Costa Rican scientists reported that tinzaparin, a drug commonly used to prevent blood clots, significantly reduces damage to cells due to spitting cobra venom.
- The team also found the drug could reduce skin damage in mice injected with the venom.

Heparan sulfate (HS)

- Heparan sulfate (HS) is a linear **polysaccharide** found in all animal tissues.
- It occurs as a **proteoglycan** (HSPG, i.e. Heparan Sulfate ProteoGlycan) in which two or three HS chains are attached in close proximity to cell surface or **extracellular matrix** proteins.

- regulates a wide range of biological activities, including developmental processes, **angiogenesis**, **blood coagulation**, abolishing detachment activity by GrB (Granzyme B), and tumour **metastasis**.
- Angiogenesis is the physiological process through which new **blood vessels** form from pre-existing vessels
- Metastasis is a **pathogenic** agent's spread from an initial or primary site to a different or secondary site within the host's body; the term is typically used when referring to metastasis by a **cancerous** tumor

Inducing sleep with pills



Q

Q: What chemical in tablets causes sedation and how does it work?

A: Barbiturates, derivatives of barbituric acid, are mainly used in tablets to cause sedation and hypnotic activity. The list also includes benzodiazepines and alcohol. They decrease the total REM time and proportion of sleep spent in REM sleep with enhanced amounts of NREM sleep.

REM, or 'rapid eye movement', sleep is characterised by loss of reflexes, intermittent jerky eyeball movements, brief body twitches, and irregular heart beats and blood pressure. Non-REM is a relatively deactivated phase divided into four stages, numbered 1-4.

By most physiological criteria related to the autonomic and central nervous systems, REM sleep is more like wakefulness than non-REM sleep, but drugs that cause arousal in wakefulness, such as amphetamines, suppress REM sleep.

Sedatives cause reversible depression of the activity of all excitable tissues, including the central nervous system. The exact mechanism of the action is not known. However, they are suspected to inhibit neurotransmission in the nervous system. Neurotransmission is responsible for the exchange of information between nerve cells.

In the brain, there are two types of pathways, one that activates and the other that inhibits its activities. The endogenous neurotransmitters of the inhibitory system include gamma amino



Sedatives cause reversible depression of the activity of all excitable tissues, including the central nervous system. GETTY IMAGES

butyric acid (GABA). Sedatives potentiate the action of GABA and thereby inhibit the major pathways of the brain that keep a person awake, thus resulting in sedation or sleep.

In the brain, there are two types of pathways: one that activates and the other that inhibits its activities. The endogenous neurotransmitters of the inhibitory system include gamma-aminobutyric acid (GABA). Sedatives potentiate the action of GABA and thereby inhibit the major pathways of the brain that keep a person awake, thus resulting in sedation or sleep.

Not all drugs are REM-deprivers. Some of the latest drugs reduce stage 4 of non-REM sleep. Most of the stimulants, including amphetamines, and depressants such as barbiturates and alcohol tend to reduce REM activity on an electroencephalogram. (B. Sri Krupa and S. Lalitha, Chennai)

For feedback and suggestions

for 'Science', please write to science@thehindu.co.in with the subject 'Daily page'



Barbiturates,

- **Barbiturates, derivatives of barbituric acid, are mainly used in tablets to cause sedation and hypnotic activity.**
- **The list also includes benzodiazepines and alcohol.**
- **They decrease the total REM time and proportion of sleep spent in REM sleep with enhanced amounts of NREM sleep.**
- **REM, or ‘rapid eye movement’, sleep is characterised by loss of reflexes, intermittent jerky eyeball movements, brief body twitches, and irregular heart beats and blood pressure**

- **During the three stages of non-REM sleep, a person falls asleep and then moves from a light sleep into a deep sleep.**
- **This is when a person's brain activity, breathing, and heart rate slow down, body temperature drops, muscles relax, and eye movements stop**

BIG SHOT



Palaeontologists from the Federal University of Santa Maria working on a dinosaur fossil discovered in Sao Joao do Polesine, Brazil. The image was released on July 18. Heavy rain that caused historic flooding in southern Brazil brought to the surface a “very well-preserved” dinosaur fossil about 230 million years old, scientists said. AFP

Flooding and fossils

- **Palaeontologists from the Federal University of Santa Maria working on a dinosaur fossil discovered in Sao Joao do Polesine, Brazil.**
- **Heavy rain that caused historic flooding in southern Brazil brought to the surface a “very well-preserved” dinosaur fossil about 230 million years old**
- **Santa Maria is a municipality in the central region of Rio Grande do Sul, the southernmost state of Brazil**

BEIJING

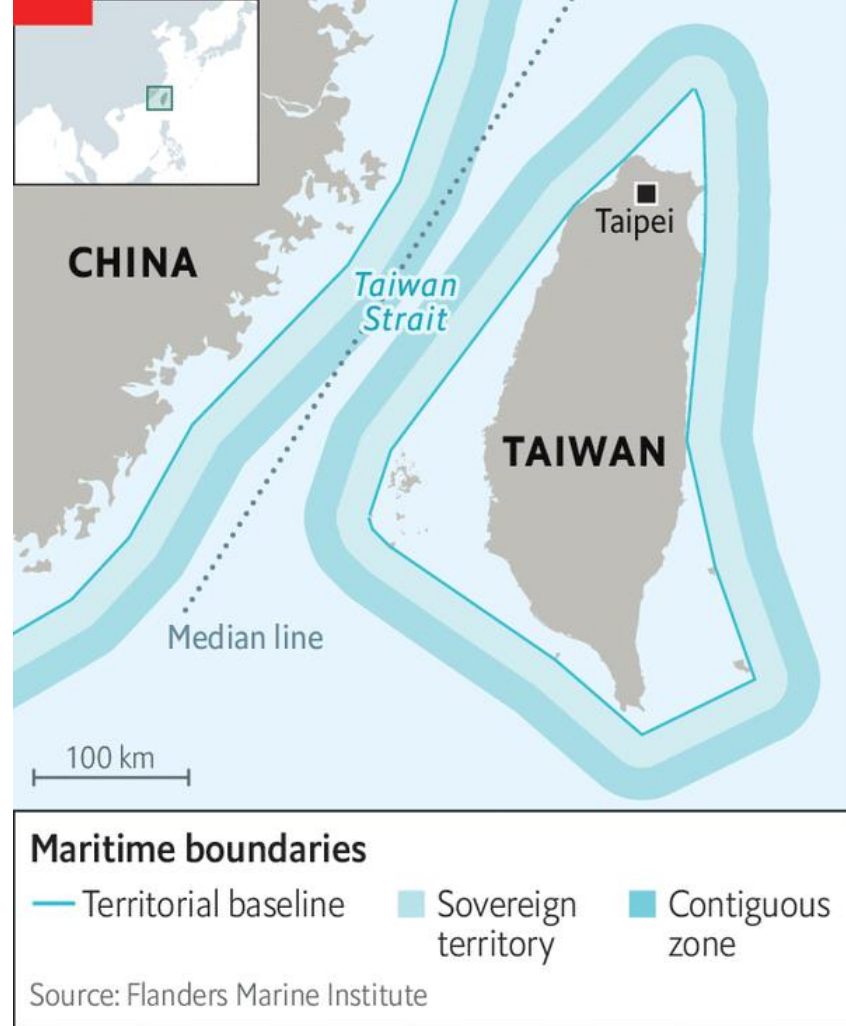
Taiwan Strait is not a 'political showground', China tells Japan



AP

China warned Japan that the Taiwan Strait is not a “political showground”, and that Japan should be cautious in its words and deeds when it comes to the Taiwan issue. Chinese Foreign Minister Wang Yi gave the warning during a meeting with visiting MP Hiroshi Moriyama of Japan’s Liberal Democratic Party. REUTERS





What is the history between China and Taiwan?

- Taiwan's first known settlers were Austronesian tribal people, believed to have come from modern day southern China.
- Chinese records appear to first mention the island in AD239, when an emperor dispatched an expeditionary force to it - a fact Beijing uses to back its territorial claim.
- After a relatively brief spell as a Dutch colony, Taiwan was administered by China's Qing dynasty, before it was ceded to Tokyo after Japan won the First Sino-Japanese War.

- **After World War Two, Japan surrendered and relinquished control of territory it had taken from China. Afterwards, Taiwan was officially considered occupied by the Republic of China (ROC), which began ruling with the consent of its allies, the US and UK.**
- **But in the next few years a civil war broke out in China, and then-leader Chiang Kai-shek's troops were defeated by Mao Zedong's Communist army**

- **Chiang, the remnants of his Kuomintang (KMT) government and their supporters - about 1.5m people - fled to Taiwan in 1949.**
- **Chiang established a dictatorship that ruled Taiwan until the 1980s.**
- **Following his death, Taiwan began a transition to democracy and held its first elections in 1996**



Cut off: The Taung Kalat Buddhist complex on Mount Popa in Myanmar's Mandalay Region. AFP

War in Myanmar's heartland silences volcano shrine

Agence France-Presse

POPA

A shrine perched on an extinct volcano in Myanmar's Mandalay region, once thronged with the bustle of pilgrims praying to flower-eating spirit Popa Maedaw, has been cut off from the faithful following the civil war.

Now, the prayers have fallen silent at the Taung Kalat shrine, the plains around it a battle zone and the faithful mostly blocked from access by fighting and checkpoints manned by all sides in the conflict.

Myanmar has been in turmoil since 2021, when the military ousted Aung San Suu Kyi's government, ending a 10-year experiment with democracy and sparking nationwide protests. The junta's crackdown on dissent sparked renewed fighting with ethnic minority armed groups in the borderlands and sent thousands to join newer People's Defence Forces (PDF) formed to battle the military. "There are not many young people here anymore," said one shop owner on the road that winds up through thick forest to the summit of Mount Popa, the extinct volcano. "They have gone to join the PDF."

The Taung Kalat shrine honours Popa Maedaw, one of dozens of nats, or guardian spirits, that exist alongside Buddhism in Myanmar.

The plains surrounding Mount Popa are home to the Bamar ethnic majority and were largely untouched by decades of Myanmar's conflict.

Taung Kalat

- Taung Kalat is a Buddhist monastery and temple complex located on **Mount Popa** in **Mandalay Region, Myanmar**.
- The site is built on a tall **volcanic plug**, and is one of several prominent *nat* spiritual sites in the vicinity of nearby **Mount Popa**.
- The nats are god-like spirits venerated in **Myanmar** and neighbouring countries in conjunction with **Buddhism**.

Russia, China push back after U.S. Arctic strategy flags military cooperation

Agence France-Presse
WASHINGTON

Russia and China on Tuesday pushed back against a U.S. warning over their increasing military and economic cooperation in the Arctic, where climate change is opening up greater competition.

Russia has in recent years beefed up its military presence in the Arctic by reopening and modernising several bases and airfields abandoned since the end of the Soviet era, while China has poured money into polar exploration and research.

“We have seen growing cooperation between the

PRC and Russia in the Arctic commercially, with the PRC being a major funder of Russian energy exploitation in the Arctic,” Deputy Secretary of Defence Kathleen Hicks told presspersons on Monday, using an abbreviation for the People’s Republic of China.

‘Joint exercises’

There is also growing military cooperation, “with Russia and China conducting joint exercises off the coast of Alaska,” Ms. Hicks said as the department released its 2024 Arctic strategy.

“All of these challenges have been amplified because the effects of climate

change are rapidly warming temperatures and thinning ice coverage, and it’s enabling all of this activity,” she said.

The rapid melting of polar ice has sent activity in the inhospitable region into overdrive as nations eye newly viable oil, gas and mineral deposits as well as shipping routes in an area with a complex web of competing territorial claims.

Moscow is heavily promoting its Northern Sea Route, an alternative cargo route for vessels travelling between Europe and Asia.

China and Russia both defended their policies in the region on Tuesday.



The rapid melting of polar ice has sent activity in the region into overdrive as nations eye oil, gas and mineral deposits. REUTERS

Beijing said it acts on the “principles of respect, cooperation, mutual wins and sustainability”, adding it was “committed to main-

taining peace and stability” in the region.

“The United States distorts China’s Arctic policy and makes thoughtless re-

marks on China’s normal Arctic activities (which are) in accordance with international law,” Foreign Ministry spokesperson Mao Ning said.

‘Territory of discord’

Kremlin spokesperson Dmitry Peskov said Russia “does its part to ensure that the Arctic does not become a territory of discord and tension.”

He told presspersons that Russia’s cooperation with China “contributes to an atmosphere of stability and predictability” in the Arctic and their actions were not targeted against other countries.

Washington’s Arctic

strategy describes the area as “a strategically important region” for the United States that includes “the northern approaches to the homeland” and “significant U.S. defence infrastructure.”

It says climate change could result in the Arctic experiencing its first “practically ice-free summer by 2030.”

“Increases in human activity will elevate the risk of accidents, miscalculation, and environmental degradation,” and U.S. forces “must be ready and equipped to mitigate the risks associated with potential contingencies in the Arctic,” the strategy said.

Russia and china cooperation in Arctic

- **Russia and China pushed back against a U.S. warning over their increasing military and economic cooperation in the Arctic, where climate change is opening up greater competition.**
- **Russia has in recent years beefed up its military presence in the Arctic by reopening and modernising several bases and air-fields abandoned since the end of the Soviet era, while China has poured money into polar exploration and research**

- **growing military cooperation, “with Russia and China conducting joint exercises of the coast of Alaska.**
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US Approach



- **Washington’s Arctic strategy describes the area as “a strategically important region” for the United States that includes “the northern approaches to the homeland” and “significant U.S. defence infrastructure.”**
- **It says climate change could result in the Arctic experiencing its first “practically ice-free summer by 2030.”**
- **“Increases in human activity will elevate the risk of accidents, miscalculation, and environmental degradation,**

A.P. gets ₹15,000 cr. to build Amaravati, aid for Polavaram

Appaji Reddem
VIJAYAWADA

The Union Budget spells a boost to Andhra Pradesh, with a special financial support of ₹15,000 crore for developing its capital Amaravati, besides assistance for the Polavaram irrigation project, grants for backward regions.

“Recognising the State’s need for a capital, we will facilitate special financial support through multilateral development agencies. In the current financial year, ₹15,000 crore will be arranged, with additional amounts in future

years,” Union Finance Minister Nirmala Sitharaman said in her Budget speech on Tuesday.

She said the government has made concerted efforts to fulfil the commitments in the AP Reorganisation Act.

Ms. Sitharaman said the Centre would come up with a plan named ‘Purvodaya’ for the overall development of Bihar, Jharkhand, West Bengal, Odisha and Andhra Pradesh.

A few days ahead of the Budget, Chief Minister and TDP chief N. Chandrababu Naidu, a key NDA ally, had apprised the Centre of the



A.P. Chief Minister N. Chandrababu Naidu in Amaravati. G. N. RAO

“dismal” financial situation Polavaram project and other projects in the State.

Blaming the past government of “irregularities”, he sought substantial financial support for developing Amaravati,



the Polavaram irrigation pro-

ject. This apart, she has also ensured the promotion of industrial development, and funds for essential infrastructure such as roads, water, power and railways.

As part of it, the Kopparty Industrial Node, the corridor between Visakhapatnam and Chennai, will be developed on a priority basis. Grants for backward regions of Rayalaseema, Prakasam and north coastal Andhra Pradesh will also be provided.

The State is also expected to benefit from the funding plan that will cover 53,000 tribal villages across the country.

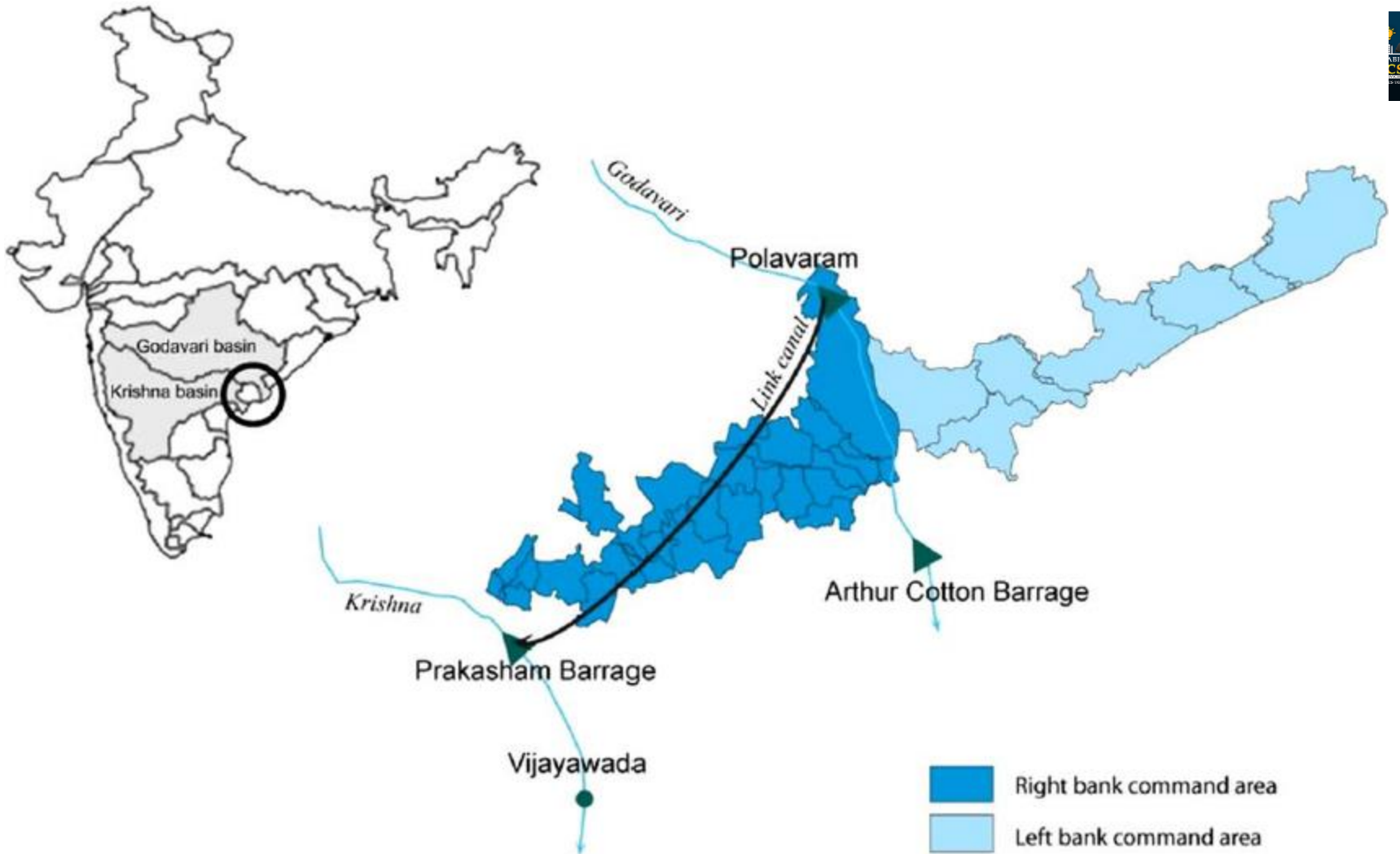
Mr. Naidu thanked Prime Minister Narendra Modi on X for the allocations to the State.

“On behalf of the people of Andhra Pradesh, I thank the Hon’ble Prime Minister, @narendramodi Ji and Hon’ble Union Finance Minister, @nsitharaman Ji, for recognising the needs of our State and focusing on a capital...This support from the Centre will go a long way towards rebuilding Andhra Pradesh. I congratulate you on the presentation of this progressive and confidence-boosting Budget,” Mr. Naidu said

The Polavaram Project



- **The Polavaram Project is an under construction multi-purpose irrigation project on the Godavari River in the Eluru District and East Godavari District in Andhra Pradesh.**
- **The project has been accorded National project status by the Central Government of India.**



Angel tax on foreign investments in start-ups nixed



Ashokamithran T.

MUMBAI

In a major respite to India's fledgling start-ups, Finance Minister Nirmala Sitharaman announced scrapping of the contentious angel tax on foreign investments received by such enterprises, a development that is expected to ease their funding woes.

Ms. Sitharaman introduced the measure stating that it would help "bolster the Indian start-up ecosystem, boost the entrepreneurial spirit, and support innovation".

The tax was introduced during the UPA regime, she said in a media briefing on Tuesday while outlining measures the NDA government took for the growth of start-ups.

Replying to queries on the possibility of money laundering due to the abolition, Revenue Secretary Sanjay Malhotra said, "There are other provisions in the Income Tax [Act] itself to find out the source of these funds." The Prevention of Money Laundering Act continued to be in existence. The existing laws were sufficient to cater to it, Mr. Malhotra added.

"We hope that even some of the past investments which are not alrea-



We hope some past investments not already under dispute will have a little more benign outlook from the tax department

ASHISH AGGARWAL,

VP & Head of Public Policy,
NASSCOM

dy under dispute will probably have a little more benign outlook from the tax department," Ashish Aggarwal, VP & Head of Public Policy at NASSCOM, told *The Hindu*.

"This new development will lead to cessation of fresh litigation. Furthermore, funds that would



have been tied up in deposits for cases involving notice issuance cease," said Brijesh Damodaran, Partner at Auxano Capital. The aboli-

tion of angel tax assumes significance as it comes at a time when start-up funding fell 60% in 2023 to \$10 billion, according the Indian Tech Startup Funding Report 2023 by Inc42, a private start-up media and information platform.

The tax was opposed by several industry players as they believed it curbed foreign investment and deterred the growth of start-ups.

Angel tax

- Angel tax refers to the income tax that the government imposes on funding raised by unlisted companies, or startups, if their valuation exceeds the company's fair market value.
- It falls under Section 56 (II) (viib) of the Income Tax Act.
- "Govt abolishes Angel tax for all classes of investors in startups"

Stocks wobble on capital gain tax plan

The key benchmark indices recovered most of the lost ground in the second half of trading; the reaction came on the proposal to increase capital gains tax, which has been viewed as negative by investors; 'the increase in LTCG and STCG would amount to ₹15,000 crore'

Lalatendu Mishra
MUMBAI

Stock markets reacted negatively to the Budgetary provisions concerning additional tax burden on investors and closed in the negative territory led by losses in banking after experiencing high volatility.

The key benchmark indices recovered most of the lost ground in the second half of trading.

The reaction came on the proposal to raise capital gains tax, which has been viewed negatively by investors. The 5% increase in Short Term Capital Gains (STCG) tax may adversely impact short-term investors in the near term.

The BSE Sensex, having



Volatile day: The BSE Sensex, having seen intraday swing of more than 1,500 points, closed with a loss of 73.04 points. ANI

seen intraday swing of more than 1,500 points, closed with a loss of 73.04 points at 80,429.04.

The NSE Nifty 50, too, saw excess volatility and closed with a loss of 30.20 points, or 0.12%, at 24,479.05. Intraday movement was in the range of more than 500 points.

The top losers in the Sensex included L&T down 3.10%, Bajaj Finance (2.18%) and SBI (1.65%).

Heavy profit booking

After initial gains, the indices witnessed heavy profit booking on volatility surrounding the Union Budget. However, the mar-

ket managed to digest the negative factors and concluded the day on a marginal negative note, said Hrishikesh Yadve, AVP Technical & Derivative Research at Asit C Mehta Investment Intermediates.

V. K. Vijayakumar, Chief Investment Strategy, Geojit Financial Services, said the

Budget proposals, with the intent of raising tax revenue from capital gains, were slightly negative.

"The increase in STCG tax from 15% to 20% is sharp. The increase in Long Term Capital Gains (LTCG) tax from 10% to 12.5% is only marginal, particularly when seen from the perspective of increas-

ing the LTCG tax exemption limit from ₹1 lakh to ₹1.25 lakh. "The taxation of share buyback income at the hands of the recipients also is a negative. The higher taxes on F&O was expected and being done to reduce excessive speculative trades in the market."

Stating there has been an increase of Securities Transaction Tax (STT) on transactions in derivative trades in stock markets, buyback tax is now charged to individuals as against being paid by the company, Deven R. Choksey, MD, KRChoksey Shares and Securities Pvt. Ltd., said the increase in LTCG and STCG would

amount to ₹15,000 crore.

"When the new tax code is introduced next year, simplification in tax rates, unified tax rates will be a reality. It is expected, with simplified tax rates under the new tax code, tax rate will go down. Thus, in preparation of the same, FM increased LTCG by 2.5% to 12.5% (from 10%) and STCG to 20% (from 15%)," he said.

"In FY 25, there will be two tax computations required for arriving at the capital gains levy. One for transactions done between April 1, 2024 to July 23, 2024 and the second will be for transactions done between July 24, 2024 to March 31, 2025. This will create significant hardships for taxpayers."



long-term and short-term capital gains (STCG) tax

- **increase in both long-term and short-term capital gains (STCG) tax budget 2024-25**
- **As per definition, any profit or gain that arises from the sale of a 'capital asset' is a capital gain.**

- **Any profit and gains arising from the transfer of capital assets such as property, shares, bonds, vehicles, etc., shall be chargeable to tax under the head "Income from Capital Gains."**
Capital assets are classified into short-term and long-term assets.



- **Short-term capital gain/loss arises if a short-term capital asset is transferred.**
- **A short-term capital asset is an asset which is held for a period of less than or equal to 36 months, except for certain exceptions where the period is shorter: listed shares and equity-oriented funds qualify if held for less than or equal to 12 months,**
- **while immovable property and unlisted shares require a holding period of less than or equal to 24 months to be considered short-term capital assets.**

Future and options

Futures and options (F&O) are derivative products in the stock market. Since they derive their values from an underlying asset, like shares or commodities, they are called derivatives.

Two parties enter a derivative contract where they agree to buy or sell the underlying asset at an agreed price on a fixed date. This fixed date is termed the expiry date in the stock market. The reason for entering such a contract is to hedge market risks by locking the price of an asset for a future date.

One party expects the prices to rise, while the other expects the opposite. As a result, one counterpart stands to profit, and the other party bears the loss.

A future is a contract to buy or sell an underlying stock or other assets at a pre-determined price on a specific date. On the other hand, **options contract** gives an opportunity to the investor the right but not the obligation to buy or sell the assets at a specific price on a specific date, known as the expiry date.

₹1,000-crore venture capital fund to be set up for space technology start-ups



Vasudevan Mukunth
CHENNAI

The Department of Space received a marginal rise (0.02% points) as a share of outlays in the 2024-25 Union Budget compared with Revised Estimates of FY24. The bulk of the absolute increase goes toward the development of space technologies. The allocation increased marginally for space applications, decreased for space sciences, and almost halved for INSAT satellite systems over the budgeted amount in 2023-2024.

Ms. Sitharaman also announced a pool of ₹1,000 crore, or around \$120 million, as venture capital funding for space start-ups, with the goal of “expanding the space economy by five times in the next 10 years”.

However, this announcement was met with mixed reactions. Many called it a “pittance” and said the pool had to have been “10-100 times bigger”. Arup Dasgupta, Distinguished Professor in the Academy of Geoinformat-



Big ambitions: ISRO's PSLV-C58 lifts off on January 1. PTI

ics, Bhaskaracharya Institute of Space Applications and Geoinformatics, Gandhinagar, called the pool “a start”

but added that “somewhere down the line, the government has to realise that globally governments are anchor financiers and customers”.

Susmita Mohanty, director-general of think-tank Spaceport Sarabhai, said that the allocation is out of step with the Finance Minister's ambitions considering “the total funds raised in 2023-2024 by all our space start-ups combined was a paltry \$134 million”.

“As an industry, we



need to show some success beyond raising venture funding,” Prateep Basu, CEO of decision analytics start-up SatSure, told *The Hindu*. “There is not a single start-up that has crossed ₹100 crore in revenue, so the demand metrics for increasing the financial risk appetite of venture capital funding and private equity is limited today.”

Narayan Prasad, chief operations officer at satellite search, a space industry marketplace, was more optimistic about the impact of the government procuring from start-ups as an anchor customer. “The government acting as a customer is the best valida-

tion for many high-risk products to be then taken into the market,” he said.

“The government is then creating a market for competition and not picking winners based on input, which means it allows the money on the table to be looked at as an opportunity for other investors to back companies that will compete against each other to get the pie,” he added.

Mr. Basu also said the government “acting as a sponsor taking the catalytic first loss risk will cement trust in the ecosystem”.

Removing angel tax

Ms. Sitharaman also proposed removing angel tax, which space industry members hailed as less friction against new investments. In February this year, the Indian government allowed 100% automatic foreign direct investment (FDI) in satellite component manufacturing and satellite and user ground segments; up to 74% in satellite-manufacturing and operations; and up to 49% in rockets and space ports.



What Is Venture Capital (VC)?

Venture capital (VC) is a form of private equity and a type of financing for startup companies and small businesses with long-term growth potential.

Venture capital generally comes from investors, investment banks, and financial institutions.

Venture capital can also be provided as technical or managerial expertise.

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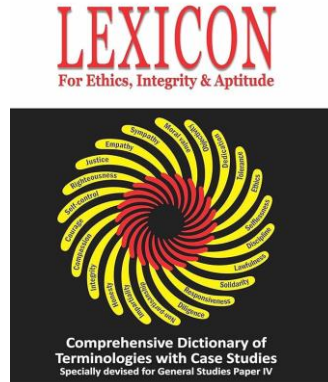
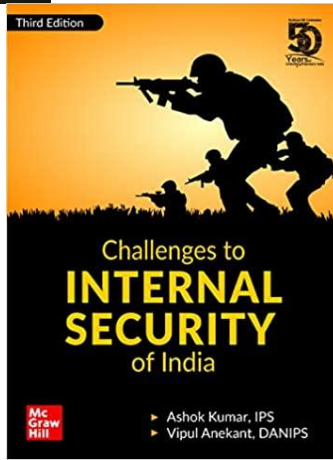
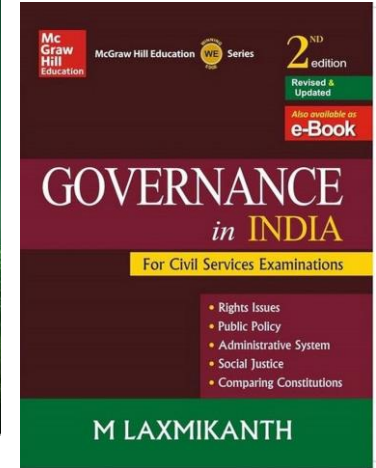
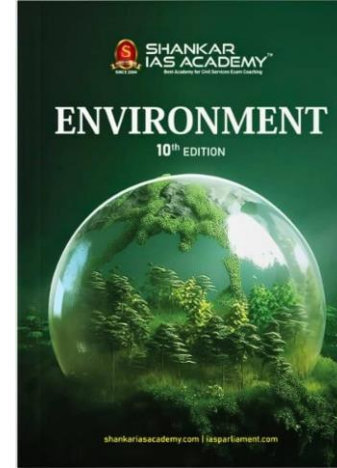
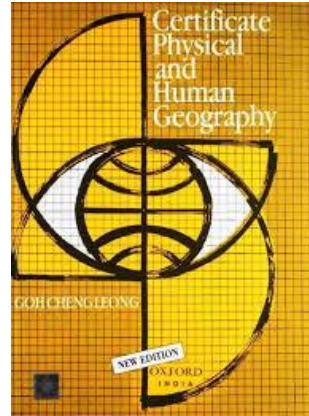
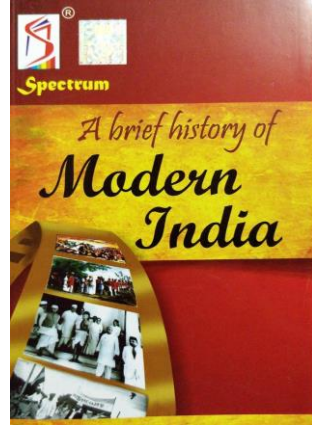
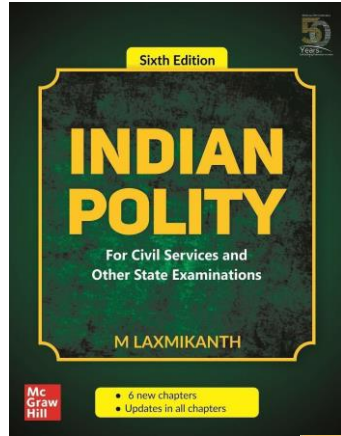
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