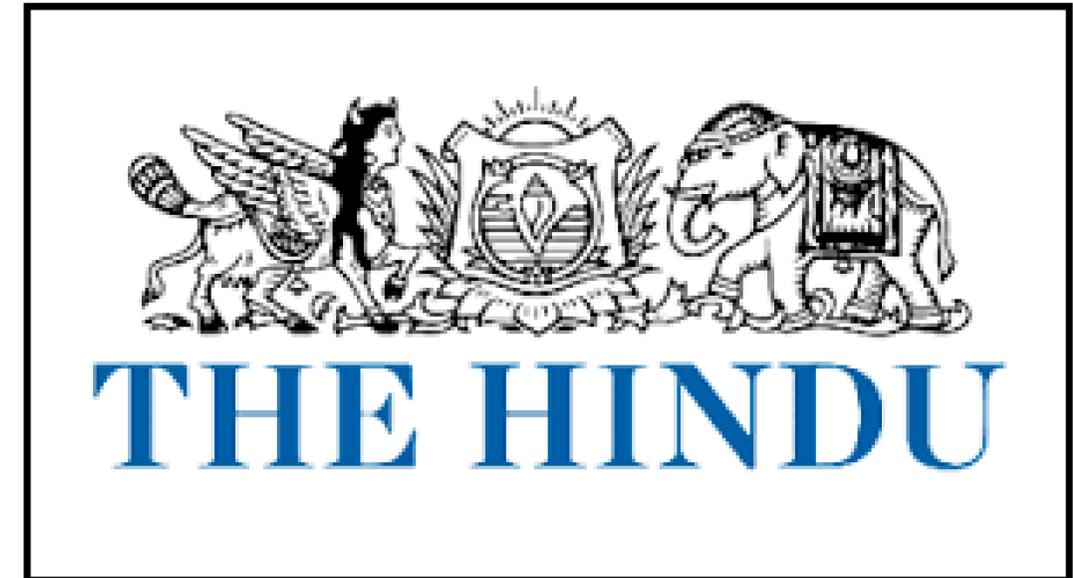




Topics



- AI IN DRUG DISCOVERY
- Europe is 'warming faster
- Approach towards climate change
- Earthquake in Taiwan
- Star campaigner
- post-stroke depression (PSD)
- Mains



By saurabh pandey sir



Target Mains 2024/25



Q“ Development without disaster preparedness will not be sustainable”

Examine

प्रश्न" आपदा तैयारी के बिना विकास टिकाऊ नहीं होगा"

परीक्षण करें

send your answer - Saurabh pandey

upsc telegram channel



TOPERS FIRST FULL LENGTH TEST -2 (PRELIMS VIJAY SERIES)



- 1- Ankur
- 2- Puja yadav
- 3- Nikki Aggarwal

Prelims Vijay series TEST-2 (full length) ×

Student leaderboard

Student name	Marks	Grade	Rank
Ankur	137.93/200	B	1
Puja Yadav	118.6/200	B	2
Nikki Aggarwal	101.92/200	B	3
MAYANK AWASTHI	101.26/200	B	4th
Renu	93.23/200	C	5th
Asmita	89.94/200	C	6th

The tools helping scientists up the rate at which they find new drugs

As advances in drug-target discovery pull away from drug development, the spotlight on tools, and expertise required for the latter – including molecular docking simulations, chemical libraries, structural and computational biologists, institute-industry collaboration – has grown harsher

Somdatta Karak

India is one of the world's leading manufacturers as well as consumers of antimicrobial drugs. However, many of these life-saving drugs are now becoming ineffective against disease-causing bacteria. Around 4.9 million people around the world died in 2019 due to ineffective antimicrobial drugs. These deaths include those due to the infections as well as the morbidity resulting from antimicrobial resistance. Yet, we have also been struggling to find new drugs.

One way out of this crisis is for researchers to discover new pathways crucial for the survival of pathogens, and disrupt them. However, the modern targeted drug-discovery process is a complex process and often requires customised solutions for each target.

How does drug discovery begin?
Two research groups working at the CSIR-Centre for Cellular and Molecular Biology, Hyderabad, recently identified potential targets for new antimalarial drugs by studying the basic biology of *Escherichia coli* bacteria and the human malarial parasite *Plasmodium falciparum*.

Manjula Reddy's group has been studying how the bacteria's outer cell-walls expand when the bacterial cell grows in size before dividing into two. The group's focus is on the peptidoglycan layer, a mesh of sugar and amino acids in *E. coli* essential for the bacteria's survival. When the cell grows, the mesh breaks and extra peptidoglycan material is added to enlarge the mesh.

In the last decade, Dr. Reddy's group has identified a set of peptidoglycan hydrolase enzymes that are responsible for cutting the peptidoglycan layer, with the latest one published in the journal *PLoS Genetics* in February. These enzymes are present in all types of bacteria, and are potent drug targets. Inhibiting them could prevent the peptidoglycan layer from expanding, thus killing the bacteria.

Likewise, Purnan Singh Sijwali's group studies how the *P. falciparum* parasite grows in human red blood cells and liver cells, depending on its developmental stage. The group focuses on how the parasite degrades its own proteins that it doesn't need anymore. It uses a class of enzymes called Cullin RING ligases. They tag proteins with another small protein called ubiquitin. The protein degradation apparatus identifies the ubiquitin and breaks the protein to which ubiquitin is attached.

Recently, Dr. Sijwali's group reported two such enzymes crucial for the parasite's development in the journal *PLoS Pathogens*.

How many steps does discovery have?
The next step for them is to find drugs that act on these identified targets. But a quick search on the PubMed database (of life science and biomedical research papers) shows scientists across the world publishing thousands of papers reporting new drug targets – however, most of them haven't translated to new drugs yet.

A major reason for the barrier is the need for people with expertise in various areas to work together over an extended period of time.



The road between identifying new drug targets and actually having drugs against those targets is long but necessary. GETTY IMAGES

Normally, the drug-discovery process starts with finding an inhibitor molecule that binds to a target and blocks its function. Researchers check for how well the two molecules bond with each other, which depends on their structures and chemical properties. Dr. Reddy developed a simple and robust assay that lets her visualise if drug-like molecules act on her target enzymes. But most scientists need access to the structures of their potential drug targets to move the work ahead.

Dr. Reddy works with *E. coli*, a model organism. Many protein structures of *E. coli* are already available in databases. But this isn't the case for the work of Dr. Sijwali and others: determining the enzymes' structures they have been working with is challenging because these are large molecules made of multiple proteins (each containing more than 20,000 atoms).

How else can structures be revealed?
The next best thing is to assess an enzyme's structure based on the known structures of similar molecules, known as homologs, in other organisms. The more evolutionarily related the homologs are, the more similar their structures will be.

Scientists then run the structures of the target molecules through computer programmes called molecular docking simulations. These programmes try to fit the known structures of small drug-like compounds into the structure of the target molecule and predict how well they will bind each other. It helps that multiple such chemical libraries are available.

There are libraries of drugs already approved by agencies such as the U.S. Food and Drug Administration for their safety and many of them are already sold in the market for a disease. There are also much larger libraries of chemical



Around 4.9 million people around the world died in 2019 due to ineffective antimicrobial drugs. These deaths include those due to the infections as well as the morbidity resulting from antimicrobial resistance

compounds that research institutes have made and/or identified to be effective against a disease of their interest but which haven't yet been tested for human safety.

Can artificial intelligence help?
Where existing libraries also fall short, some AI-driven computer programs can also predict the structures of potential drug molecules. Chemists can synthesise them *de novo* (from scratch) or one can pick existing molecules with similar structures and modify them.

Some, like Dr. Sijwali, are contributing their expertise to AI-based companies to help with computational drug discovery, and plan to work with the pharmaceutical industry to synthesise them.

Others recommend drug companies add the newly discovered targets to their to-be-tested lists. These companies already have the capacity to conduct high-throughput screening – a process in which researchers check the suitability of thousands or even millions of molecules in parallel. Such molecules are more logistically and financially feasible than one scientist testing a handful of drug targets.

Why is drug discovery challenging?
Once a suitable group of molecules has

been identified, they will have to be tested procedurally for safety and efficacy. First in a cell culture model and then in experimental animal models, researchers check if the inhibitors selectively work against pathogens (rather than against human cells). Today, many startups also work as contract research labs and perform such tests. After this begin the clinical trials, which are closely regulated to ensure they are ethically conducted and produce data uncompromised by any bias. If the trials' results surpass a predetermined threshold of success, regulatory authorities approve the drugs for the market.

This road between identifying new drug targets and actually having drugs against those targets is long but necessary. It requires expertise of many kinds to ease the process. Developing tools such as molecular docking simulations, AI-driven drug discovery, and chemical libraries all exemplify collaborations between infectious disease biologists, structural biologists, computational biologists, chemists, and various research institutions motivated by a common cause and, of course, sufficient funding. This network also has to expand to include startups and the industry at large.

Researchers are making more fundamental discoveries vis-à-vis pathogens that are relevant to more local communities – *P. falciparum* or *Mycobacterium tuberculosis* in South Asia, e.g. The research and innovation community in these regions should take note of them, team up, and use the best techniques and facilities available to them to accelerate drug discovery.

(Somdatta Karak, PhD is the head of science communication at CSIR-Centre for Cellular and Molecular Biology, Hyderabad.)





AI IN DRUG DISCOVERY

- **Where existing libraries also fall short, some AI-driven computer programs can also predict the structures of potential drug molecules.**
- **Chemists can synthesise them de novo (from scratch) or one can pick existing molecules with similar structures and modify them.**
- **AI-based companies to help with computational drug discovery, and plan to work with the pharmaceutical industry to synthesise them**



PRESCOUTER

AI in drug discovery & development

Aggregating and synthesizing information

 **ARPEGGIO**
BIOSCIENCES

- Combines new RNA sequencing technologies with proprietary machine learning
- Mine data to help quickly identify the direct targets of a novel drug

TRL 5

Understanding disease mechanisms

 **PHENOMIC.AI**

- Analysis of genome-wide screens
- Identify proteins involved in regulating the cell cycle
- Discovery of the next generation of therapies against cancer.

TRL 3

 **STRUCTURA**
BIOTECHNOLOGY

- Training computer vision and machine learning models on cryo-EM data
- Provide detailed spatial 3D structure of proteins and molecular complexes
- CryoSPARC System™ software enables reconstructions of research and drug targets.

TRL 8

Generating novel drug candidates

 **Atomwise**

- Structure-based deep CNN
- Predict bioactivity of small molecules
- Predict new active molecules for targets with no previously known modulators
- Development of agricultural pesticides (partnered with Monsanto)

TRL 5

 **twoAR**

- Screen compound libraries for efficacy against a disease
- Identify biologic targets
- Uncover novel disease biology hypotheses supported by real world data.

TRL 4

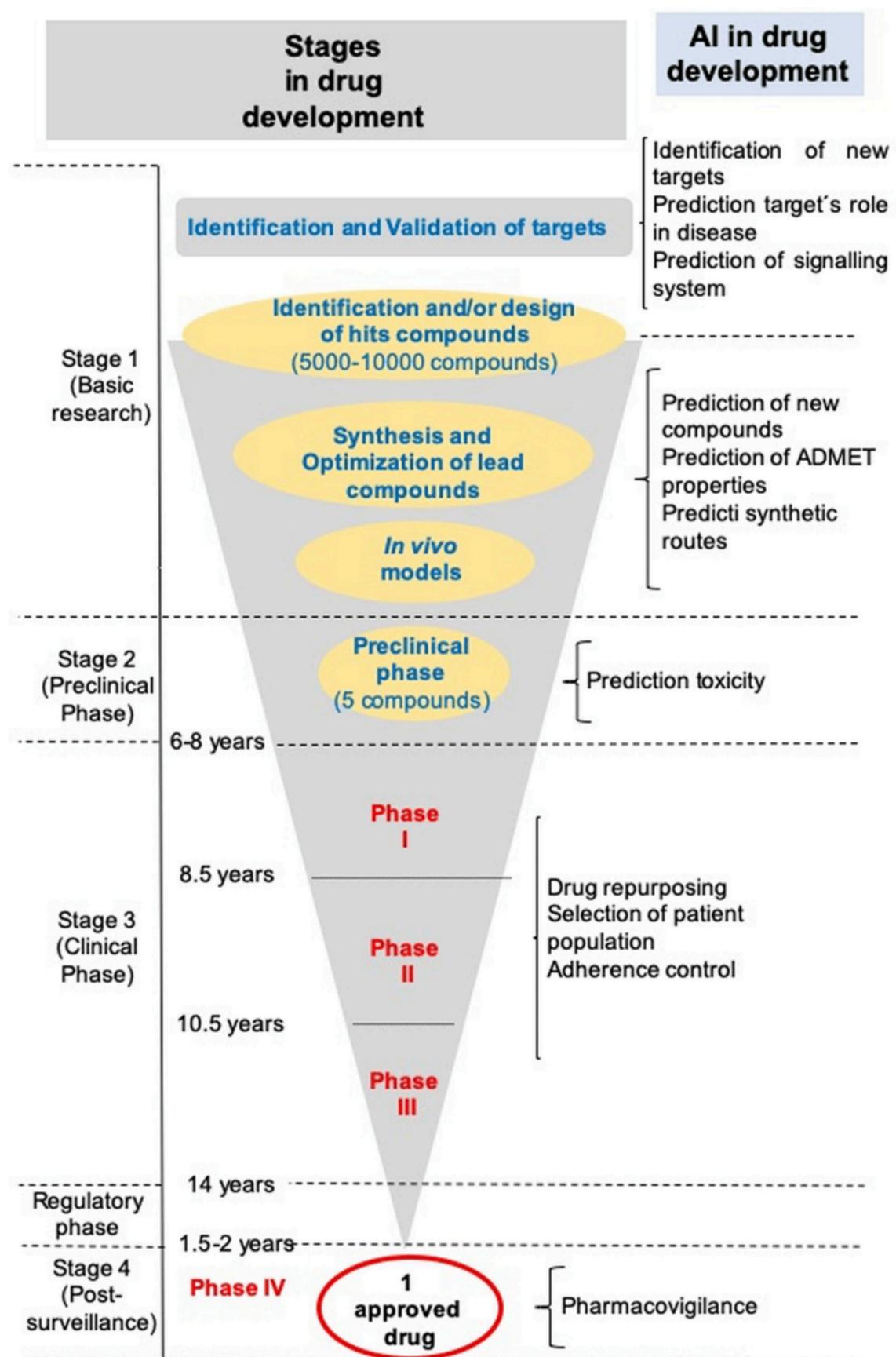
 **ReviveMed**

- Network-based machine learning approach
- Measure metabolite masses fast and inexpensively
- Predict the identity of each metabolite mass
- Integrate data with other large-scale molecular datasets

TRL 3

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A lake of meltwater formed on the tongue of the Rhone Glacier near Goms, Switzerland. AP

Europe is 'warming faster than any other continent'

Associated Press

Europe is the fastest-warming continent and its temperatures are rising at roughly twice the global average, two top climate monitoring organisations reported on April 22, warning of the consequences for human health, glacier melt and economic activity.

The U.N.'s World Meteorological Organisation and the European Union's climate agency, Copernicus, said in a joint report the continent has the opportunity to develop targeted strategies to speed up the transition to renewable resources like wind, solar, and hydroelectric power in response to the effects of climate change.

The continent generated 43% of its electricity from renewable resources last year, up from 36% the year before, the agencies say in their European State of the Climate report for last year. More energy in Europe was generated from renewables than from fossil fuels for the second year running.

The latest five-year averages show temperatures in Europe are now running 2.3 degrees Celsius above pre-industrial levels, compared to 1.3 degrees Celsius higher globally, the report says.

"Europe saw yet another year of increasing temperatures and intensifying climate extremes – including heat stress with record temperatures, wildfires, heat

Deaths related to heat have risen. More than 150 lives were lost in storms, floods and wildfires. Climate-related economic losses were estimated at more than €13.4 billion in 2023

waves, glacier ice loss and lack of snowfall," said Elisabeth Hamdouch, the deputy head of unit for Copernicus at the EU's executive commission.

The report serves up a continental complement for WHO's flagship state of the global climate report, which has been published annually for three decades, and this year came with a "red alert" warning that the world isn't doing enough to fight the consequences of global warming.

Copernicus has reported that March marked the 10th straight month of record monthly temperatures. The average sea-surface temperature for the ocean across Europe hit its highest annual level in 2023, the Europe report said.

The report focuses this year on the impact of high temperatures on human health, noting that deaths related to heat have risen across the continent. It said more than 150 lives were lost directly last year in connection with storms, floods and wildfires. The cost of weather- and climate-related economic losses in 2023 were estimated at more than 13.4 billion euros.

"Hundreds of thousands of people were affected by extreme climate events in 2023, which have been responsible for large losses at continental level, estimated to be at least in the tens of billions of euros," said Copernicus director Carlo Buontempo.

Extreme weather fanned heat waves, wildfires, droughts and flooding, the report said. High temperatures have contributed to a loss of glacier ice on the continent, including in the Alps – which have lost about 10% of their remaining glacier ice over the last two years.





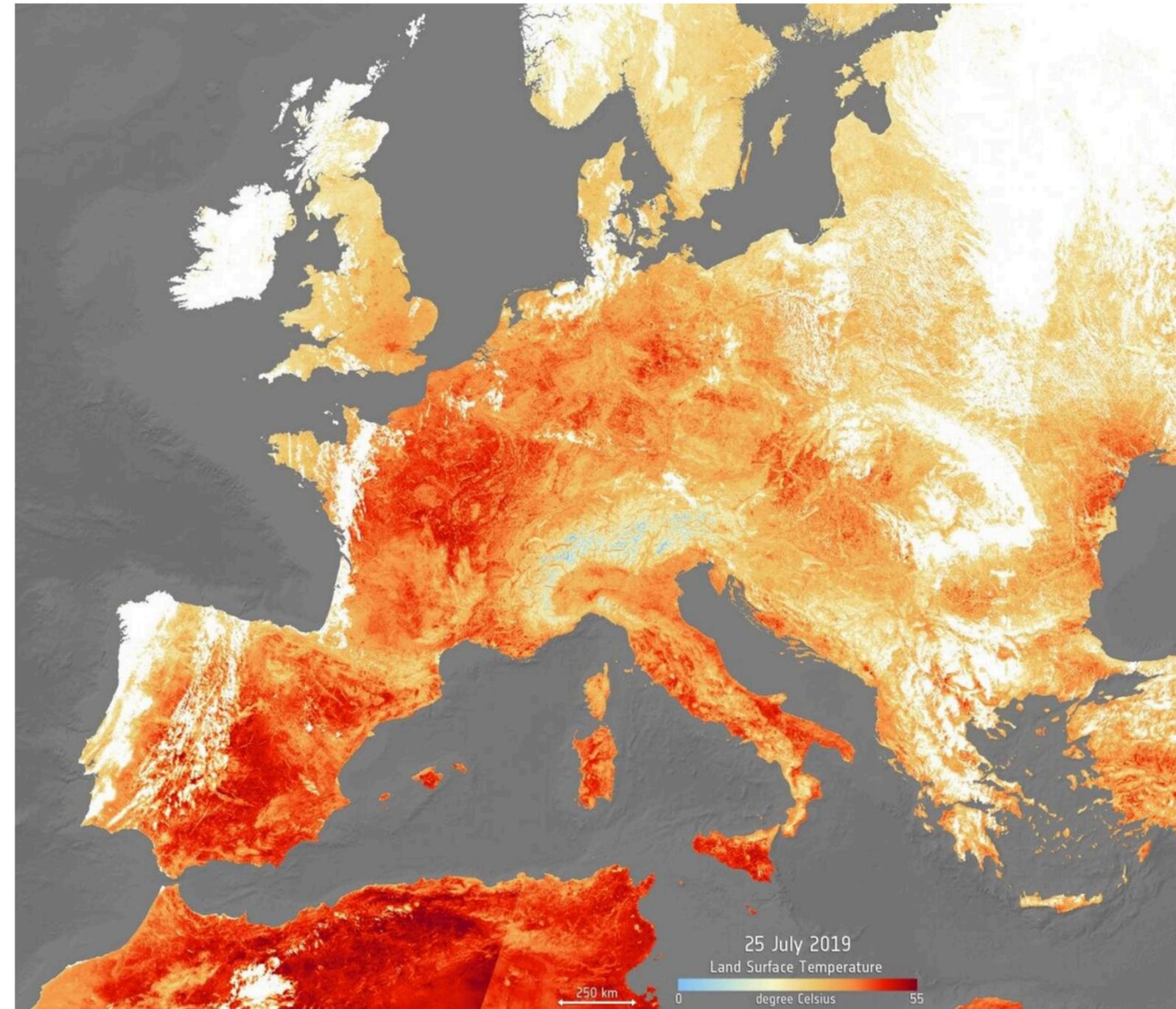
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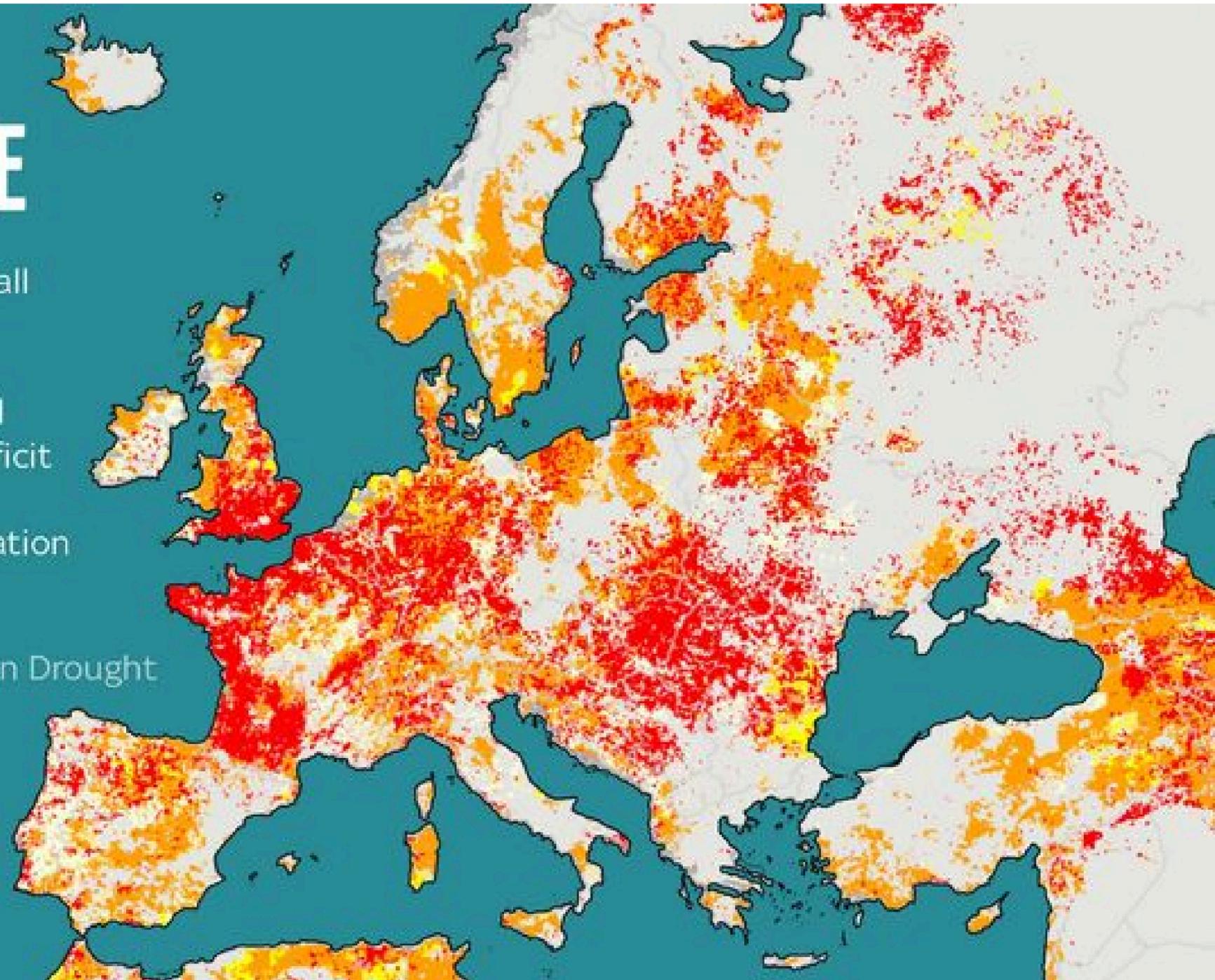
- **The average sea-surface temperature for the ocean across Europe hit its highest annual level in 2023, the Europe report said.**



EUROPE

-  Watch: rainfall deficit
-  Warning: soil moisture deficit
-  Alert: vegetation stress

Source: European Drought Observatory
11-20.09.22



Restoring earth's right to 'good health'

In a landmark decision, the European Court of Human Rights found the Government of Switzerland guilty of violating the rights of a group of women senior citizens of a Swiss civil society group called KlimaSeniorinnen, noting that the government's actions to curb emissions were inadequate and had failed to protect women against the impacts of climate change.

As a first of its kind decision anywhere in the world, it highlights how the climate crisis is increasingly becoming a human rights crisis.

A similar watershed moment happened in India a month ago, when the Supreme Court of India ruled that people have a right 'to be free from the adverse impacts of climate change', citing Articles 14 (equality before law and the equal protection of laws) and 21 (right to life and personal liberty) of the Indian Constitution as the sources.

The latest State of the Global Climate Report by the World Meteorological Organization reveals that most climate change indicators reached record levels in 2023. It confirmed 2023 to be the hottest year since we started recording global temperatures. Records were also broken for ocean heat, sea level rise, Antarctic Sea ice loss and glacier retreat.

A planet under stress

The health of the planet is under extreme stress, impacting people's right to live a healthy life. The UN Secretary General António Guterres's message on International Mother Earth Day 2024 underscores the dire situation, 'Humanity is acting like Mother Earth's delinquent child. We depend on nature... Yet, we have brought chaos to the natural world... These actions harm nature, and they harm humanity... Together, we must restore harmony with nature...'

As one of the world's fastest growing economies, India has made rapid strides in decoupling emissions from economic growth. It has already achieved two of its Nationally Determined Contribution (NDC) targets, viz. reducing the emissions intensity of its GDP by 33% to 35% from 2005 level, and achieving 40% cumulative electric power installed capacity from non-fossil fuel sources, well ahead of the target year of 2030.

However, the country remains highly vulnerable to climate change. More than 80% of its population lives in districts that are at risk of climate-induced disasters. Rising temperatures and natural disasters are manifesting into major crises affecting livelihoods and food security, and exacerbating existing socio-economic inequalities.

It is here that the court's observation sets an important precedent, looking at these impacts of climate change from a rights perspective,



Caitlin Wiesen

is Resident Representative a.i., United Nations Development Programme (UNDP) India



Ashish Chaturvedi

is Head, Action for Climate and Environment, United Nations Development Programme (UNDP)-India

Recent judicial pronouncements and observations that attempt to bring the impacts of climate change within the purview of constitutional fundamental rights, pave the way for legal accountability of climate action

affecting humanity's right to health, life, liberty and much more. By bringing the impacts of climate change within the purview of constitutional fundamental rights, it paves the way for legal accountability of climate action.

The observation provides several points of departure with the potential to accelerate climate action both on the demand and supply side – on the demand side, by invoking a more rights-based approach to climate action, and on the supply side, by encouraging integrated approaches and action between government, private sector and civil society.

The first such point of departure could be the adoption of an overarching regulation on climate change which takes forward the policy-driven approach of climate action in India couched in the National and State Action Plans on Climate Change. An overarching regulation has the intended benefits of enhancing state capacities by driving allocation of funds, functions and functionaries.

A report by the London School of Economics and Political Science analysed climate change framework laws across 60 countries, concluding that they have helped establish the strategic direction for national policies that go beyond meeting targets under global environmental conventions. This includes countries from both the Global North such as Germany, Ireland, New Zealand, Finland and South Korea, as well as the Global South such as South Africa and the Philippines.

These laws have resulted in increased public sector staffing and capacity to deliver climate action, including a significant expansion in public sector resourcing. While India has several laws and regulations related to tackling climate change, a framework law can help strengthen climate governance by building effective institutional frameworks and processes, enabling more ambitious climate action.

Further, it has the potential to provide for a more stringent and distributed accountability, and promoting the exchange of knowledge and ideas. Out of all the States and Union Territories in the country, 18 are classified as moderately to highly vulnerable to climate change. A forum that enables the sharing of best practices on implementation of policies can build coherence in policies and actions between States and Union Territories.

SDGs and localisation model

A case in point is India's localisation model for the Sustainable Development Goals (SDGs), which has successfully integrated the SDGs into local-level planning through multi-tiered and multi-stakeholder processes. States and territories take ownership by creating their own SDG road maps and monitoring systems, and

friendly competition among them spurs innovation and faster progress. To ensure effective implementation, capacities of local governments are built. The model also encourages broader participation from businesses, non-governmental organisations, and citizens. This has resulted in a more efficient and collaborative approach to achieve the SDGs.

The second pathway can build inter-ministerial and inter-sectoral approaches. The One Health initiative is one such example which has brought together 13 Ministries and departments in the domains of health, environment, science and technology for disease control, research, and pandemic preparedness. We need to expand this approach to the private sector on integrating a rights-based approach to climate action in their core operations. For instance, the circular economy approaches need to engage with human rights compliant supply chains, including reverse logistics, to have a truly transformative impact.

Rights-based dialogue

The third pathway can leverage the court's observation to empower citizen groups and civil society organisations in fostering a rights-based dialogue on environment, biodiversity and climate action. Within the ambit of environmental policy, it can build consensus on overcoming potential tensions between climate mitigation and action.

This is reflected in the Supreme Court's observation, which came in the backdrop of balancing conservation of the habitat of the Great Indian Bustard, a critically endangered bird species, with developing solar energy parks to meet the country's renewable energy targets. While noting that wildlife conservation cannot come at the cost of citizens' right to be protected from climate change, for which expanding renewable energy capacity is indispensable, the Court insisted upon more dialogues to arrive at a holistic solution.

Every year since 2009, April 22 is commemorated as International Mother Earth Day. The idea of 'Mother' Earth has been embedded in India's culture and traditions for centuries, regarding nature as a 'living' entity rather than just a resource.

In 2022, the Madras High Court in Tamil Nadu, while hearing a case on changing the classification of forest land, declared 'Mother Nature' a 'living being', granting it the status of a legal person with all corresponding rights, duties and liabilities, in order to preserve and conserve it.

We now need to use these judgments and observations to restore Mother Earth's right to good health, and by doing so, protect the right of people to a future free from the impacts of climate change.





Approach towards climate change

- The first such point of departure could be the adoption of an overarching regulation on climate change which takes forward the policy-driven approach of climate action in India couched in the National and State Action Plans on Climate Change.
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A lesson from Taiwan in quake resilience

In the last two decades, major earthquakes have occurred in many parts of the world including Indonesia, Japan, China, Italy, Nepal, Afghanistan, Pakistan, Ecuador, Mexico, Morocco, and the Turkey-Syria border. On April 3, Taiwan was struck by an earthquake of 7.4 magnitude. These earthquakes cannot be treated as random occurrences, as earthquake-prone regions share some tectonic similarities.

Earthquakes occur in certain regional bands. The spatial distribution is explained by the theory of plate tectonics, which explains how the Earth's outermost layer, the lithosphere, is broken into 15 major fragments or plates which are constantly moving relative to each other. This is why powerful earthquakes are concentrated along convergent plate boundaries like the Himalayas, a tectonic product of the convergence of the Indian and Eurasian plates.

The earthquake in Nepal in 2015 caused severe devastation in central Nepal, but spared India. This was an example of an earthquake originating from under the Himalayas. On April 4, 2024, the region around Manali in Himachal Pradesh was struck by an earthquake of magnitude 5.3. On the same day, 119 years ago, an earthquake occurred near Kangra, not far from Manali, killing thousands of people and levelling the buildings in the region.

The story of two earthquakes

In the Taiwan region, the Philippine Sea plate is moving northwest towards the Eurasian plate at a velocity of about 7.8 cm per year, which is faster than the motion of the Indian plate. Lying 160 km off the coast of China, Taiwan was formed at a convergent boundary of the Philippine and Eurasian plates in the western Pacific Ocean. It is a country of strong earthquakes. The latest one occurred near the city of Hualien on the eastern coast. In 1999, the Chi-Chi



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The 1999 earthquake in Taiwan was a major wake-up call. It led to critical administrative reforms to improve the emergency response and reduce disasters

earthquake of magnitude 7.7 occurred in the central part of Taiwan and impacted the western region. It killed more than 2,430 people and left 11,305 wounded. It caused more than 50,000 buildings to collapse and partially damaged as many.

The Hualien earthquake killed at least 13 people and injured about 1,000. Most of the deaths were caused by earthquake-triggered rockfalls and not by toppled buildings. Despite being of nearly comparable magnitude, the 2024 earthquake has caused minimal damage compared to the 1999 earthquake.

What is remarkable is that even in Hualien city, located within the epicentre of the latest earthquake, where shaking is expected to be most intense, only about 50 residential buildings and a nine-storey building partially collapsed. In the capital city of Taipei, only 10 houses were severely damaged. These were reported to have been constructed before the implementation of stringent building codes following the 1999 Chi-Chi earthquake.

The 1999 earthquake was a major wake-up call that led to critical administrative reforms to improve emergency response and reduce disasters. The government passed the Disaster Prevention and Protection Act and set up two national centres to handle earthquake coordination and training. Between the Chi-Chi and Hualien earthquakes, Taiwan mounted a consistent effort in implementing building codes.

Today, Taiwan's earthquake preparedness is among the most advanced in the world. The island nation has the most advanced earthquake-monitoring network and early warning systems. Widespread awareness campaigns and drills on earthquake safety have improved the public's understanding of earthquake risks. The government constantly updates the earthquake safety requirements of the new and existing building stock and incentivises residents by offering

subsidies to improve the quake resistance of buildings.

Taiwan has been able to reach sound scientific judgements based on how severe the shaking would be in each location. With the knowledge of the frequency of earthquakes in each source and how severely the ground shakes in a particular area, specific seismic codes can be designed, and specific construction norms can be followed. Taiwan could also use new technologies such as seismic dampers and base isolation systems. Taiwan's most iconic building, Taipei 101, escaped damage during the latest earthquake. One of the components that helped the building retain its integrity was a tuned mass damper, a 660-metric-ton steel sphere suspended by cables within the tower. This acts as a giant pendulum to counter any motion of the building.

What India can do

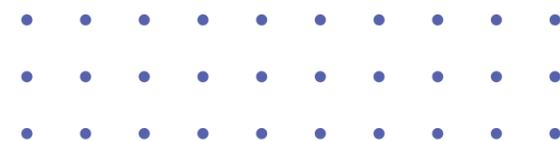
As India is going through a major phase of infrastructural expansion in many tectonically unstable regions including the Himalayas, sometimes flagrantly violating the norms that should be followed in ecologically sensitive areas, earthquake safety should be of particular concern. All infrastructural projects must comply with seismic safety regulations. The Taiwan earthquake provides important lessons for India. These include following seismic codes, constructing safer engineered structures, and overcoming inadequacies in the enforcement and non-compliance of seismic codes. These codes, unique to a particular region, are prepared based on local earthquake activity, building types, and construction materials. Indian code IS 1893 specifies seismic designs based on seismic zonation maps so that buildings do not collapse. In some parts of India, traditional architectural styles possessing earthquake resistivity can be rediscovered and encouraged.

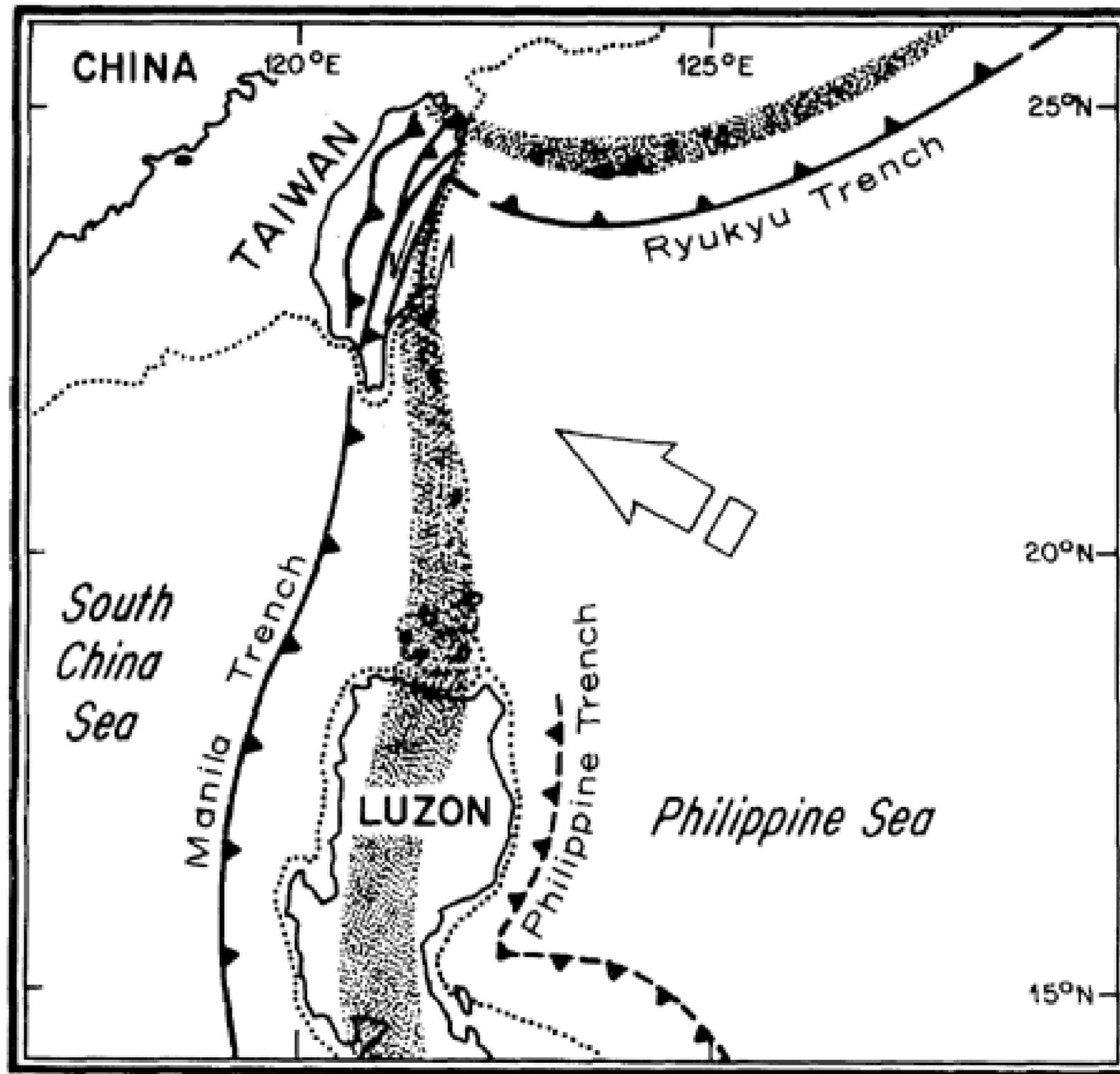




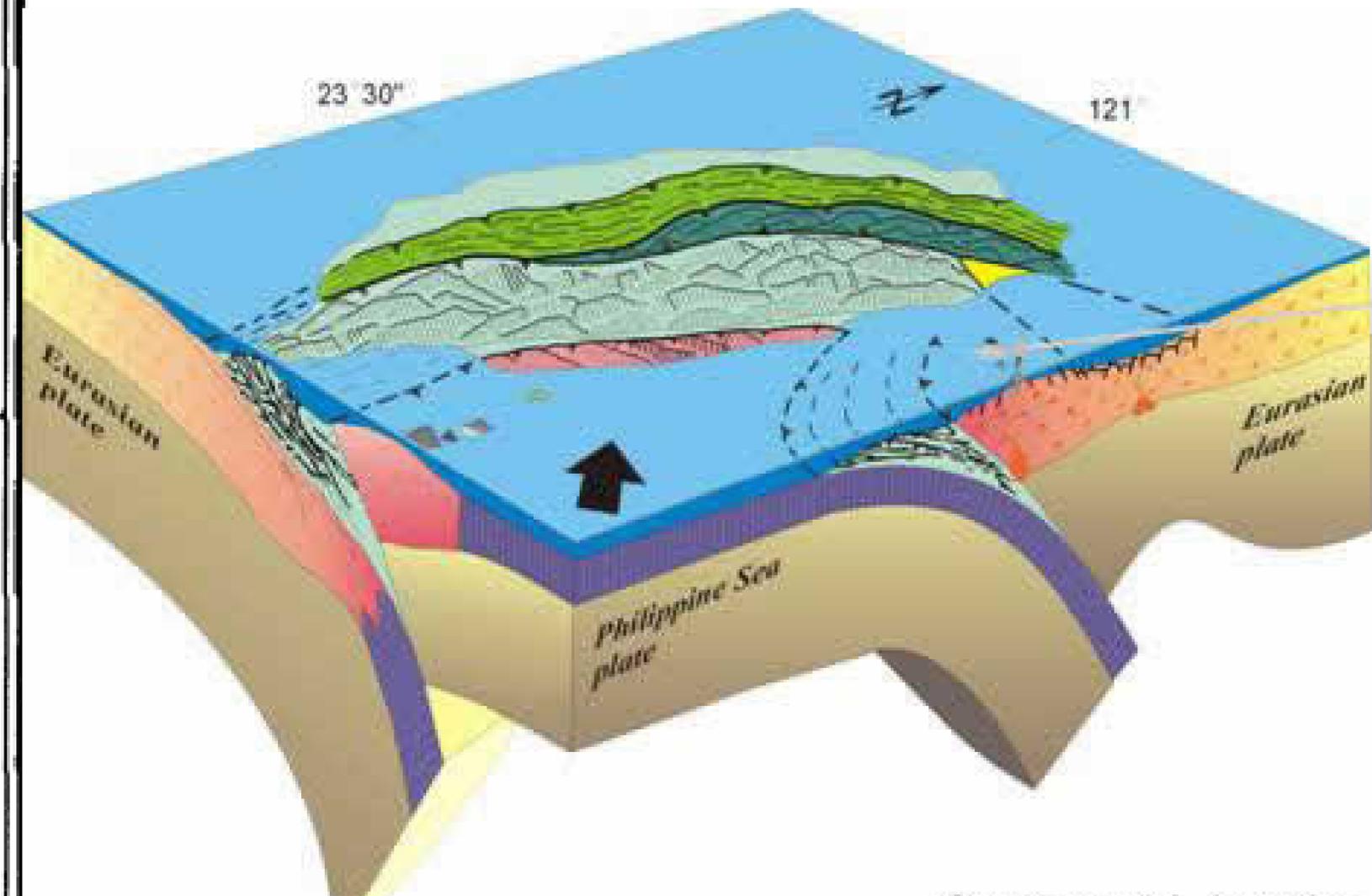
Earthquake in Taiwan

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- **Lying 160 km of the coast of China, Taiwan was formed at a convergent boundary of the Philippine and Eurasian plates in the western Pacific Ocean**





..... 200 m isobath Volcanic Arc



earthquake preparedness

- .The island nation has the most advanced earthquake-monitoring network and early warning systems.
- Widespread awareness campaigns and drills on earthquake safety have improved the public's understanding of earthquake risks.
- The government constantly updates the earthquake safety requirements of the new and existing building stock and incentivises residents by offering subsidies to improve the quake resistance of buildings.

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- Taiwan could also use new technologies such as seismic dampers and base isolation systems.

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What India can do ??

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What are rules around star campaigners

What does the Representation of the People Act, 1951 state about the expenditure incurred by 'leaders of a political party'? What was the advisory issued by the Election Commission to star campaigners? What did the Supreme Court rule with respect to the matter in 2020?

EXPLAINER

Rangarajan. R

The story so far:

Sunita Kejriwal, wife of Delhi Chief Minister Arvind Kejriwal, was appointed as a 'star campaigner' by the Aam Aadmi Party (AAP) for its campaign in Gujarat.

What are the legal provisions?

Section 77 of the Representation of the People Act, 1951 (RP Act) provides for law relating to expenditure incurred by 'leaders of a political party'. These 'leaders of a political party' are popularly known as 'star campaigners'. These star campaigners are usually the top leaders of a political party but can include other celebrities as well. The only requirement is that these persons have to be members of the political party that appoints them. The RP Act provides that a recognised political party (national or State) can appoint a maximum of 40 star campaigners while a registered unrecognised political party can appoint up to 20. These names are to be communicated to the Election Commission (EC) and Chief Electoral Officer (CEO) of the States as applicable within seven days from the date of notification of such election. In case of a multi-phase election, a political party can submit separate list of star campaigners for different phases. However, it is noticed that all major parties provide a single list for a State that is applicable for all phases.

What are the benefits?

The RP Act provides that expenditure incurred by the 'leaders of a political party' on account of travel by air or any other means of transport for campaigning for their political party shall not be deemed to be part of the election expenditure of a candidate of such party. The election expenditure limit for candidates is ₹95 lakh per Lok Sabha



To the polls: Sunita Kejriwal addresses INDIA bloc's 'Ulgulan Nyaya Maha Rally', in Ranchi on April 21. ANI

constituency in larger States and ₹75 lakh in smaller States. Hence, these star campaigners would be vote-fetchers for candidates set up by respective parties without affecting their expenditure limit. However, this is applicable only if the star campaigners limit themselves to general campaigning for the party. If in any rally/meeting organised, the star campaigner seeks votes in the name of contesting candidate(s) or shares the dais with them, then the rally/meeting expense shall be apportioned to the election expenditure of such candidate(s). If the star campaigner incurs boarding/lodging expenses while campaigning for any candidate(s), it shall be included in the expenditure account of such candidate(s) irrespective of whether it is paid for by the candidate(s). Further,

if any candidate(s) travel with the star campaigner, then 50% of the travel expenditure of the star campaigner shall also be apportioned to such candidate(s).

What are the issues?

The EC has issued an advisory to all political parties to maintain decorum and restraint in campaigning and raise the level of election to 'issue' based debate. It also put star campaigners on notice in case of any violations. The star campaigners of all parties have been guilty of using inappropriate and abusive words against leaders of other political parties – appealing to caste/communal feelings of electors and making unsubstantiated allegations. In January 2020, during a campaign for the Delhi Assembly election, the EC had ordered

removal of Anurag Thakur and Parvesh Verma of BJP from the list of star campaigners for making inflammatory utterances that violated the Model Code of Conduct. In another instance in November 2020, during the campaign for bye-elections to the Madhya Pradesh Assembly, the Supreme Court stayed the order of the EC revoking the star campaigner status of Kamal Nath of the Congress party for making a derogatory statement against a woman candidate of the BJP. The court observed that the EC does not have any such powers. Another issue is with respect to the assessment of expenditure incurred for the rally/meeting of such star campaigners which is always significantly lower than the actual expenditure. This may be due to the rate card used by the EC that does not reflect current market rates for various items. This results in lower apportionment of expenditure to contesting candidates.

What needs to be done?

At present, the RP Act stipulates that political parties can appoint or revoke the appointment of star campaigners. As per Article 324 of the Constitution, the EC is the highest authority that has been vested with the powers of superintendence and control of elections. Hence, the law may be amended to authorise the EC to revoke the 'star campaigner' status of a leader, in case of any serious violation of Model Code of Conduct, thereby depriving the party candidates of expenditure relief for their campaigns. This would hopefully instil a sense of responsibility among them and ensure that campaigns maintain the necessary decorum and restraint. Also, the assessment and apportionment of rally/meeting expenses where star campaigners' campaign for particular candidate(s) should be made more robust.

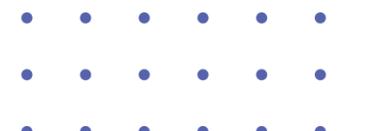
Rangarajan. R is a former IAS officer and author of 'Polity Simplified'. He trains civil-service aspirants at 'Officers IAS Academy'. Views expressed are personal.

THE GIST

Section 77 of the Representation of the People Act, 1951 (RP Act) provides for law relating to expenditure incurred by 'leaders of a political party'. These 'leaders of a political party' are popularly known as 'star campaigners'.

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Star campaigner

- **Section 77 of the Representation of the People Act, 1951 (RP Act) provides for law relating to expenditure incurred by ‘leaders of a political party’.**
- **These ‘leaders of a political party’ are popularly known as ‘star campaigners’.**
- **These star campaigners are usually the top leaders of a political party but can include other celebrities as well. The only requirement is that these persons have to be members of the political party that appoints them.**
- **The RP Act provides that a recognised political party (national or State) can appoint a maximum of 40 star campaigners while a registered unrecognised political party can appoint up to 20.**

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- **.These names are to be communicated to the Election Commission (EC) and Chief Electoral Officer (CEO) of the States as applicable within seven days from the date of notification of such election.**
- **In case of a multi-phase election, a political party can submit separate list of star campaigners for different phases.**
- **However, it is noticed that all major parties provide a single list for a State that is applicable for all phases**

What are the benefits?

- **The RP Act provides that expenditure incurred by the ‘leaders of a political party’ on account of travel by air or any other means of transport for campaigning for their political party shall not be deemed to be part of the election expenditure of a candidate of such party.**
- **The election expenditure limit for candidates is ₹95 lakh per Lok Sabha constituency in larger States and ₹75 lakh in smaller States.**
- **Hence, these star campaigners would be vote-fetchers for candidates set up by respective parties without affecting their expenditure limit. .**



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What is the treatment for post-stroke depression?

What are the ways in which disability stemming from a stroke manifests in people? How can post-stroke depression be diagnosed? Is behavioural therapy a good remedy?

Alok Kulkarni

The current World Health Organization definition of stroke is to rapidly develop clinical signs of global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than one of vascular origin. Stroke is associated with substantial neuropsychiatric morbidity including cognitive impairment, dementia, personality change, and mood disorders. Disability stemming from stroke is a mixture of physical, mental, and emotional manifestations. The neuropsychiatric features may be a result of the damage sustained by the brain or may be a function of the individual's reaction to the handicaps imposed on them. Depression is more common among stroke survivors, manifesting as post-stroke depression (PSD).

What are the clinical features of PSD?
There are several reasons outlined for the

genesis of PSD, including the stroke location, genetic factors, availability of social support, and personality factors.

The sudden onset of disability may trigger an emotional response. Brain injury and neurochemical changes may produce changes in the mood. PSD due to a stroke is strongly associated with impaired daily-life activities. The individual may have a family history of depression or may have had a depressive episode prior to the stroke.

To diagnose PSD, a clinician will have to rule out other pathologies mimicking depression. Some stroke symptoms in hospitalised patients overlap with depressive symptoms, including weight loss, fatigue, and altered sleep patterns. A clinician will need to look for symptoms such as dysphoria, loss of pleasure in previously pleasurable activities, feelings of guilt or worthlessness, impaired concentration, indecisiveness, and suicidal thoughts. Speech difficulties occur in about 30% of stroke patients, posing a major challenge to an accurate

diagnosis of depression.

Classificatory systems, while far from perfect, have certain criteria for diagnosing PSD. For example, the DSM-5 describes PSD as a depressive disorder caused by another medical condition. While many studies have prepared different estimates of the frequency of PSD, the majority zero in on a prevalence of around 30%. Gender is not a significant risk factor although some studies have identified the sex to be.

How is PSD treated?

Treating PSD involves biological, psychological, social, and rehabilitation paradigms. Such holistic and comprehensive care may not always be feasible in resource-constrained settings.

Small studies have found cognitive behavioural therapy to be effective at ameliorating depressive symptoms in stroke patients. Behavioural activation therapy could prolong the frequency of enjoyable events. Reminiscence therapy involves recalling prominent life events

and pleasant memories to enhance belonging. Research has shown it can reduce the burden of depressive symptoms following a stroke. Brain stimulation modalities, such as repetitive transcranial magnetic stimulation and transcranial direct current stimulation, have also been effective at relieving PSD.

Psychiatrists may also use antidepressants to treat PSD. There is sufficient and reliable evidence of these drugs' reliability and efficacy. But when doing so, the psychiatrist must carefully consider the type of antidepressant and regularly monitor the individual. The psychiatrist must also discuss the benefits and possible risks before initiating antidepressant therapy. There is also evidence to initiate antidepressant therapy prophylactically in stroke patients, to prevent the onset of depression.

Stroke is a common condition associated with significant morbidity. A common neuropsychiatric sequel of stroke is PSD. If left untreated, it can lead to low-quality of life. With the right treatment approaches, a full remission of depressive symptoms is possible. Stroke-ready hospitals and stroke physicians should work closely with neuropsychiatrists to facilitate better patient outcomes.

Alok Kulkarni is a senior interventional neuropsychiatrist at the Manas Institute of Mental Health and Neurosciences in Karnataka. He received the IMH Marshall Fellowship in Mood Disorders from the University of British Columbia, Vancouver.

THE GIST

▼ The current World Health Organization definition of stroke is to rapidly develop clinical signs of global disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than one of vascular origin.

▼ Depression is more common among stroke survivors, manifesting as post-stroke depression (PSD).

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post-stroke depression (PSD)

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- Stroke is associated with substantial neuropsychiatric morbidity including cognitive impairment, dementia, personality change, and mood disorders.
- Disability stemming from stroke is a mixture of physical, mental, and emotional manifestations.

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- **.The neuropsychiatric features may be a result of the damage sustained by the brain or may be a function of the individual's reaction to the handicaps imposed on them.**
- **Depression is more common among stroke survivors, manifesting as post-stroke depression (PSD)**

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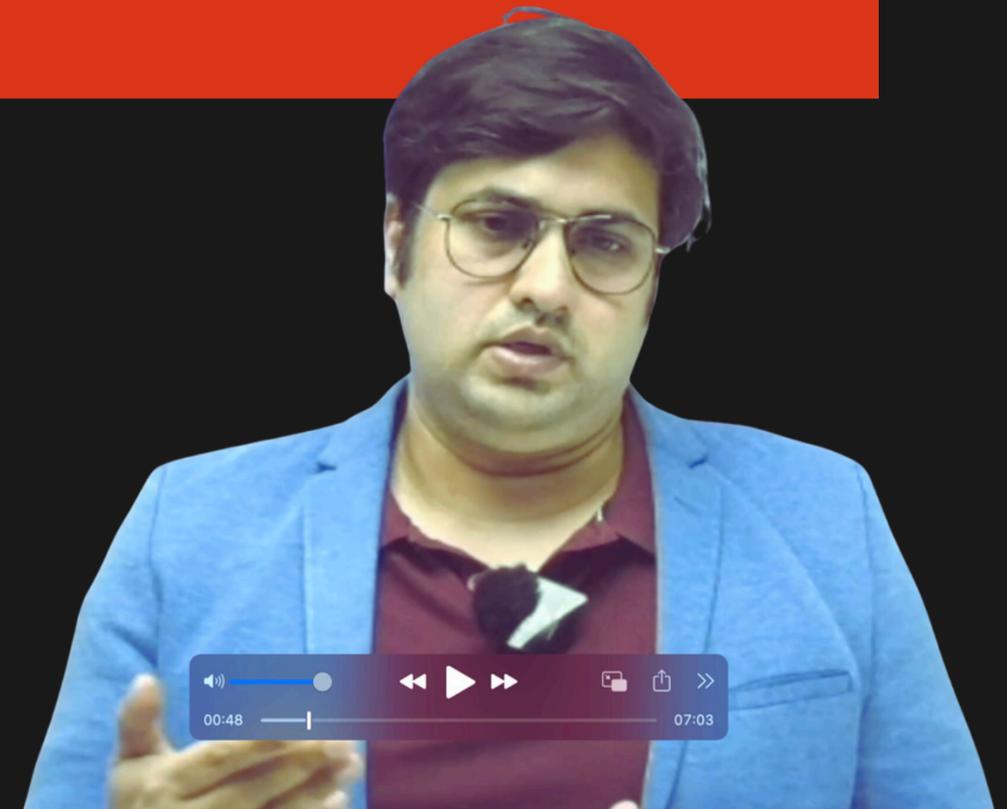
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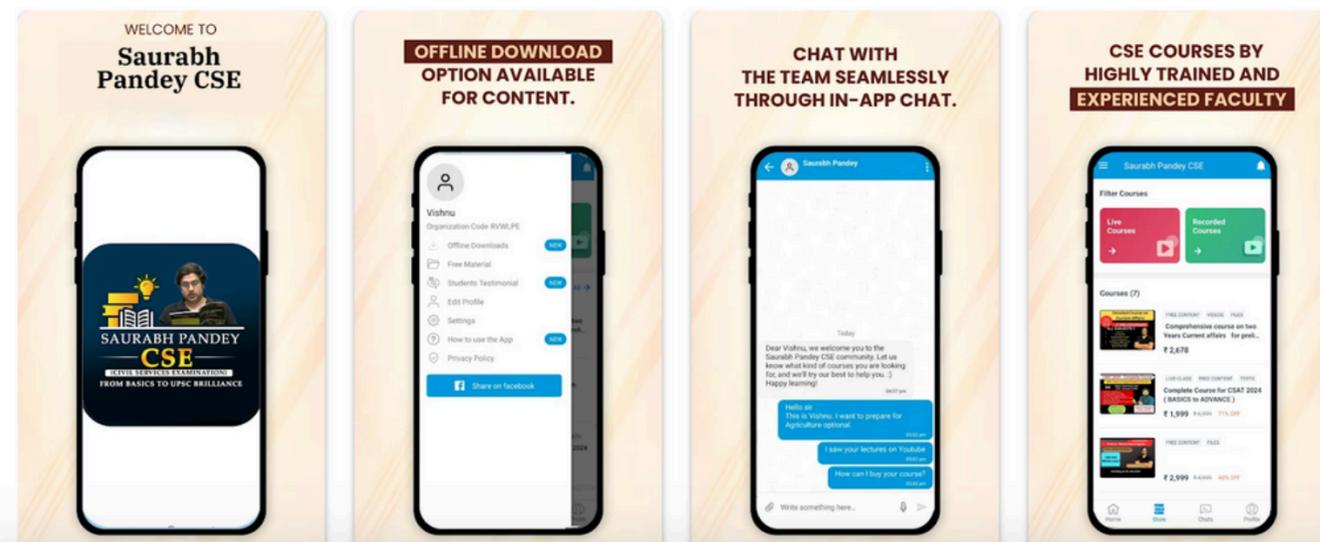
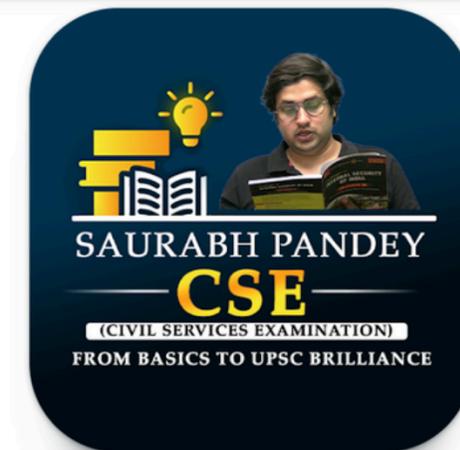
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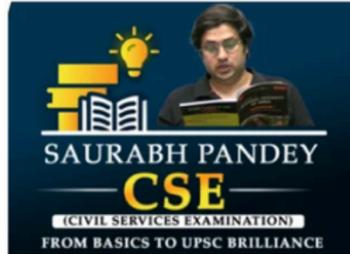
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