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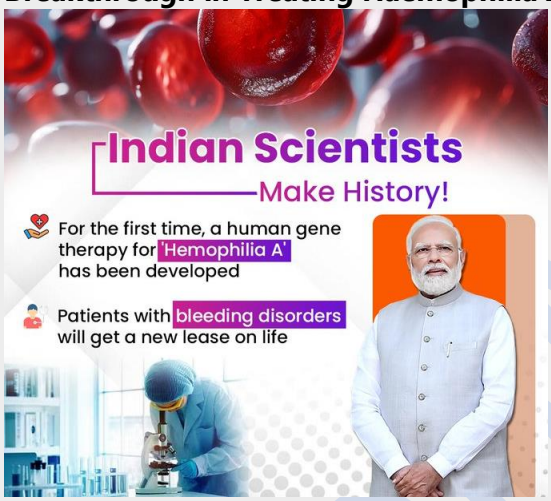
1. Indian Scientists Pioneer Gene Therapy for Haemophilia

Breakthrough in Treating Haemophilia A



Indian scientists have successfully developed a novel gene therapy to treat severe haemophilia A, a rare hereditary condition caused by a defective gene. The condition leads to severe, spontaneous, and potentially fatal bleeding episodes. In a trial conducted on five patients in Tamil Nadu, none experienced bleeding episodes over an average follow-up of 14 months. The findings were recently published in the New England Journal of Medicine (NEJM).

Trial Details

The study was led by Dr. Alok Srivastava of the Centre for Stem Cell Research (CSCR) at the Christian Medical College in Vellore, with financial support from the Union Department of Biotechnology.

Gene Therapy: A One-Time Solution

Current treatments for haemophilia A involve regular injections of clotting factors. Gene therapy offers a potential one-time solution by introducing a gene that enables the body to produce sufficient clotting factor to prevent bleeding.

Understanding Haemophilia A

• What is Haemophilia A?

Haemophilia A is the more common type of haemophilia, caused by the absence of Factor VIII, a key blood-clotting protein.

• Severity Levels:

Severe haemophilia patients have less than 1% of clotting factor and require frequent treatment with Factor VIII replacements, monoclonal antibodies, or substitutes mimicking Factor VIII.

• Prevalence in India:

India has one of the largest haemophilia patient populations globally, with an estimated 40,000 to 1,00,000 patients.

Cost of Treatment

Treatment is prohibitively expensive, with a study estimating a 10-year treatment cost at $3,00,000 (₹2.54 crore) per patient in India.

Comparison with Roctavian

The only commercially approved gene therapy, Roctavian, was approved by the U.S. FDA in 2023. It reduced annual bleeding incidents from 5.4 to 2.6 in patients but required corticosteroids to suppress immune responses for efficacy.

Advantages of the Indian Approach

The Indian therapy avoids the use of adenovirus vectors employed in Roctavian, making it potentially safer and suitable for children.

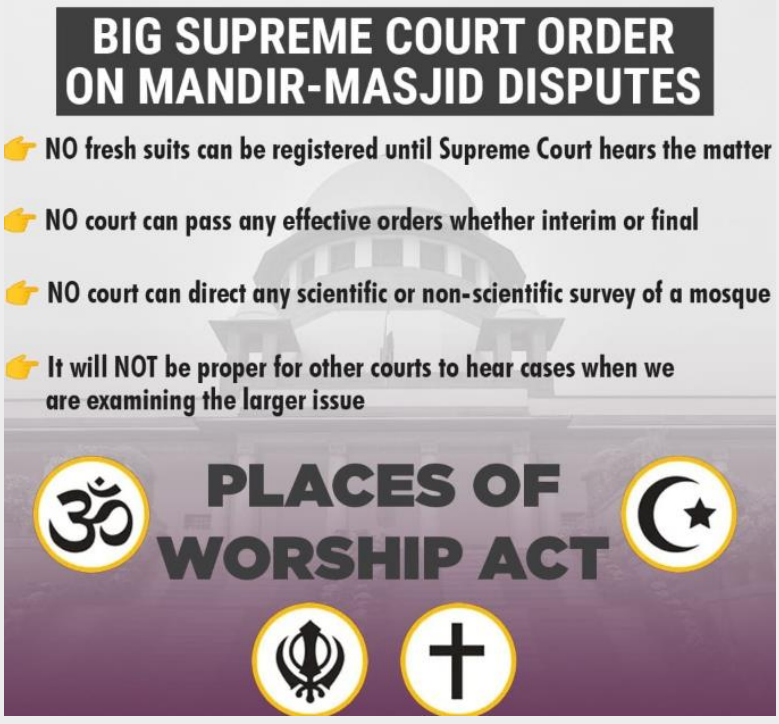
Global Recognition

Independent expert Johny Mahlangu, in an NEJM editorial, called the study "ground-breaking." He highlighted its significance in demonstrating the feasibility of advanced gene therapy in resource-constrained settings like India.

Relevance: GS Prelims; Science & Technology

2. 1991 Places of Worship Act: What Supreme Court stopped, why

Overview



The Supreme Court recently barred civil courts across the country from registering fresh suits challenging the ownership and title of any place of worship, and from ordering surveys of disputed religious places until further orders.

"As the matter is sub judice..., we deem it appropriate to direct that no fresh suits may be filed nor registered or proceedings be ordered till further orders of this court... We also direct that in pending suits, the courts would not pass any effective interim orders or final orders including orders of survey till the next date of hearing," the Bench headed by Chief Justice of India Sanjiv Khanna said.

Case before the court

The Bench, also comprising Justices P V Sanjay Kumar and K V Viswanathan, was hearing petitions challenging the constitutional validity of the Places of Worship Act, 1991.

The law, brought in the wake of the Ayodhya movement, prohibits conversion of any place of worship and provides for the maintenance of the religious character of places of worship as it existed on August 15, 1947.

Only the Ram Janmabhoomi-Babri Masjid dispute was kept out of the purview of the law since the case was already sub judice.

What the order impacts

The order applies to both civil suits that are already pending (there are several; below) and to those that may be filed in the future.

The order bars the "registration" of cases by civil courts. Consequently, they also cannot order a survey, or seek a report from the Archeological Survey of India (ASI), as they have done in several recent instances.

All these civil cases have raised questions on the title of mosques, arguing that they were built on Hindu religious structures that were razed by medieval rulers.

The SC also observed that court orders in these civil suits could be challenged on the grounds that they violate larger constitutional principles of secularism and the rule of law, irrespective of the Places of Worship Act.

Challenge to the 1991 Act

Meanwhile, the SC will have to hear the constitutional challenge to the 1991 Act. These petitions have been pending since 2020. It remains to be seen if the Centre will defend the law or argue against it.

The petitioners have challenged the law on two main grounds. First, that it takes away the power of judicial review by abating claims that existed at the time of passing the law and prohibiting fresh claims in courts. Second, that it is arbitrary in retrospectively picking August 15, 1947 as the cut-off date for determining the religious character of a place of worship.

In 2019, in the five-judge Constitution Bench ruling in the Ayodhya case, the SC had referred to the 1991 law as forming a part of the "basic structure of the Constitution".
While the 1991 law was not directly under challenge in that case, the SC observations could still be relevant in determining the constitutional validity of the law.

Places of Worship Act: A timeline

1991: Places of Worship (Special Provisions) Act enacted; said "religious character" of a place of worship will remain as it was on August 15, 1947. Only exception: "Ram Janma Bhumi-Babri Masjid". The Ayodhya agitation was raging at the time; Babri Masjid was still standing.

Oct 2020: First petition filed challenging the Act; five more filed subsequently — on grounds of arbitrariness on date, and the fact that it takes away judicial review.

Aug 2021: Five women filed suit in Varanasi seeking permission to pray at the Gyanvapi mosque.

May 2022: After case reached SC, then CJI D Y Chandrachud orally observed that a survey "may not necessarily fall foul" of the Places of Worship Act.

2022-2024: At least six suits were filed claiming past existence of a Hindu temple at the site of a mosque or dargah. Surveys were ordered in three of these cases.

Dec 2024: SC barred further survey orders, further "effective" orders, and the registering of fresh suits.

PENDING SUITS ON MOSQUE-TEMPLE DISPUTES

Shahi Jama Masjid, Sambhal
Case: Suit filed on November 19 claiming mosque was built on ruins of an ancient temple that was dedicated to Lord Kalki.
Status: Civil Judge (Senior Division), Sambhal ordered survey, which triggered violence on November 24, in which several people were killed. On November 29, SC asked court not to proceed with suit for now.

Atala Mosque, Jaunpur
Case: Suit filed in May 2024 seeking declaration that Atala Devi temple existed at site; possession of property; restraining order against non-Hindus.
Status: Survey ordered; Jaunpur court was to hear plea for security to surveyors on December 16. Petition filed at Allahabad HC challenging registration of suit.

Kamal Moula Mosque, Bhojshala Complex, Dhar
Case: Petition filed before MP HC in 2022 challenging 2003 ASI order allowing Muslims to offer namaz on Fridays.
Status: In March 2024, HC sought "scientific survey". In April, SC disallowed digging that changes character of premises.

Gyanvapi Mosque, Varanasi
Case: Suit filed on behalf of Adi Vishweshwar in 1991. In 2021 five Hindu women sought permission to worship there.
Status: Sessions Judge ordered ASI survey; upheld maintainability of 2021 suit in 2023. Maintainability of 1991 suit was also upheld in 2022.

Shamsi Jama Masjid, Budaun
Case: Suit filed in 2022 by Akhil Bharat Hindu Mahasabha claiming temple to Neelkanth Mahadev stood at site; seeking permission to pray.
Status: Fast-track court in Budaun is currently hearing arguments on maintainability of the suit.

Quwwat-ul-Islam Mosque, Delhi

Case: In 2020, suit filed seeking restoration of Hindu and Jain deities inside mosque in Qutub Minar complex.
Status: Civil Judge rejected suit in 2021 stating it was barred by provisions of Places of Worship Act, 1991. Challenge to this order is pending.

Shahi Idgah Mosque, Mathura
Case: Several suits filed since 2020 seeking removal of mosque; also question validity of 1968 "agreement" that allowed mosque and a new temple to co-exist.
Status: In August 2024, Allahabad HC rejected challenge to maintainability of suits. Mosque committee has gone to SC.

Teele Wali Masjid, Lucknow
Case: In 2013, suit filed by Hindus seeking survey of mosque allegedly built after Aurangzeb demolished temple.
Status: Maintainability of suit pending before Allahabad HC; suit seeking injunction to allow Hindu devotees to pray pending before Civil Judge.

Ajmer Sharif Dargah, Ajmer
Case: Suit filed in September 2024 claiming there is evidence of a temple to Lord Shiva at the site.
Status: Civil Judge issued notices to Union Ministry of Minority Affairs, ASI, and the Ajmer Dargah Committee on November 27.

Malali Juma Masjid, Mangaluru
Case: Suit filed in 2022 by VHP claiming "temple like" structure was found beneath the mosque during renovation; requested survey of premises.
Status: On January 31, 2024 Karnataka HC ordered trial court to first decide on maintainability of suit.

Relevance: GS Prelims & Mains Paper II; Governance
Source: Indian Express

3. How much water does India have available? Here is what Central Water Commission found

Introduction
The Central Water Commission (CWC) in its study titled 'Assessment of Water Resources of India 2024' estimated that India's average annual water availability, between 1985 and 2023, stood at 2,115.95 billion cubic meters (BCM).

What is the CWC's water availability figure based on?
In its study, the CWC assessed the average annual water availability based annual net-runoff using precipitation, evapotranspiration, land use, land cover, and soil datasets as major inputs. The water availability has been assessed for all river basins in the country, excluding three western tributaries of the Indus (Indus, Jhelum, and Chenab).

How is the availability of water distributed across geographic regions?

According to the CWC report, Brahmaputra (592.32 BCM), Ganga (581.75 BCM), and Godavari (129.17 BCM) were the top three basins with the highest water availability across the country, while Sabarmati (9.87 BCM), Pennar (10.42 BCM), and Mahi (13.03 BCM) were bottom three basins in terms of water availability.

Basin	**Water Availability (BCM)**
Barak & Others	93.65
Brahmani-Baitarani	31.27
Brahmaputra	592.32
Cauvery	26.53
Eastern Flowing Rivers Between Mahanadi & Pennar	23.33
Eastern Flowing Rivers Between Pennar & Kayakumari	27.06
Ganga	581.75
Godavari	129.17
Indus (Eastern)	47.30
Krishna	86.32
Mahanadi	72.82
Mahi	13.03
Minor Rivers draining into Myanmar & Bangladesh	31.86
Narmada	49.45
Pennar	10.42

Sabarmati	9.87
Subarnarekha	14.48
Tapi	20.98
Western Flowing Rivers from Tadri to Kanyakumari	116.47
Western Flowing Rivers from Tapi to Tadri	110.44
Western Flowing Rivers of Kutch & Saurashtra including Luni	26.95
Total	**2115.95**

What were the findings of the previous assessments?
The 2,115.95 BCM figure is higher than the previous estimate made in 2019, which calculated water availability from 1985 to 2015 to be at 1,999.2 BCM.

About a half a dozen water availability assessments, using various methodologies, had been carried out prior to 2019. All of these found water availability to be under 2,000 BCM, with the earliest estimate in 1901-03 giving a 1,443.2 BCM.

Why is the current water availability figure higher than previous assessments?
This is primarily due to methodological factors. First, the new assessment takes into account Bhutan's contribution to the Brahmaputra, which was not included in the assessment conducted in 2019. Second, while Nepal's contribution to the Ganga was only partially taken into account in the 2019 assessment, the current study includes it fully.

According to the CWC, "The current study includes all trans-boundary water entering India in the Brahmaputra basin, in the Ganga basin and in the Indus basin (eastern rivers)."

Why is such an assessment significant?
The assessment of water availability is significant for the sustainable management of water resources, which face challenges from factors such as urbanisation, industrialisation, and climate change.

It is also a prerequisite to calculate the per capita water availability, which is one of the indicators used for measuring water scarcity. According to the most common method for calculating water scarcity, known as the Falkenmark Indicator or Water Stress Index, a country would be deemed to be under "water stress" if the per capita water availability in a country is below 1,700 cubic meters. A per capita water availability of under 1,000 cubic meters puts a

country in "water scarcity", whereas a per capita water availability of below 500 cubic meters means "absolute water scarcity".

According to the Ministry of Jal Shakti, the average annual per capita water availability for the year 2021 was 1,486 cubic meters based on annual water availability of 1,999.2 BCM assessed in the CWC's 2019 study. Taking the latest assessments into account, this figure will be higher (1,513 cubic meters for 2024 using a projected population figure of 1.398 billion) but still below the 1,700 cubic meters mark.

Is all available water utilisable?

The CWC's numbers, however, do not refer to water that is utilisable. For instance, in 2019, the average water resources availability was assessed at 1999.2 BCM, but the utiliSable surface water resources were estimated to only be 690 BCM.

As per the CWC, the proportion of utilisable surface water resources to average water resources potential is very high in smaller basins except in West Flowing River basins from Tapi to Tadri and Tadri to Kanyakumari, Sabarmati and Mahi. The proportion of utilisable surface water resources to average water resources potential is found to be minimum in Brahmaputra sub-basin, as per the CWC.

Relevance: GS Prelims & Mains Paper III; Environment
Source: Indian Express