

CHENAB BRIDGE

Chenab Bridge, the world's highest steel arch rail bridge situated in Jammu and Kashmir's Reasi town, is set to be developed as a tourist spot.



- **Location:** It is located between Bakkal and Kauri in the Reasi district of Jammu and Kashmir (J&K).

- The **1.3-km-long bridge** is located **359 metres** above the Chenab riverbed.
- It is the **highest single-arch railway bridge** in the world.
- It is **part of the Udhampur-Srinagar-Baramulla Rail Link project**.
- **Features:**
 - The **arch consists of steel boxes**. **Concrete has been filled in the boxes** to improve stability.
 - The bridge has been designed with a **life span of 120 years**.
 - It has been designed to **withstand high wind speeds of up to 266 Kmph**.
 - It is capable of **withstanding the nation's maximum intensity zone-V earthquake forces**.

Key Facts about Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project:

- The USBRL Project involves the construction of a railway line from Udhampur to Baramulla, **joining the Kashmir valley with the Indian Railways network**.
- **Aim:** To **connect Kashmir to the rest of the country** and give a push to development in the valley.
- **Total Length:** 272 km
- The project was **declared a "National Project" in 2002**.
- The project includes the **construction of several bridges and tunnels** along the route.
- This project involves **38 tunnels (combined length of 119 Km)**, with the **longest tunnel (T-49)** having a length of 12.75 Km and is **the country's longest transportation tunnel**.
- There are **927 nos. of bridges (combined length of 13 Km)**, including the iconic Chenab Bridge.
- The project includes the Indian Railway's **first cable-stayed, bridge which is being constructed on Anji Khad**.

VERY SHORT-RANGE AIR DEFENCE (VSHORAD) MISSILE SYSTEM

The Indian defence establishment recently initiated a tender for the procurement of 30 units of the indigenous Very Short-Range Air Defence (VSHORAD) missile system.



About Very Short-Range Air Defence (VSHORAD) missile system:

- It is a Man Portable Air Defence System (MANPAD) specially designed to counter low-altitude aerial threats over short distances.
- These are short-range, lightweight, and portable surface-to-air missiles that can be fired by individuals or small groups.
- It has been designed and developed indigenously by DRDO's Research Centre Imarat (RCI), Hyderabad, in collaboration with other DRDO laboratories and Indian industry partners.
- The use of VSHORAD missiles in India is primarily by the Indian Army.
- **Features:**
 - It is designed to provide short-range air defence capabilities to protect ground forces and critical assets from aerial threats, including helicopters and low-flying aircraft.
 - The missile incorporates many novel technologies, including a Dual-band IIR Seeker, a miniaturised Reaction Control System, and integrated avionics.
 - It is propelled by a dual-thrust solid motor.
 - The missile and its launcher were designed by the DRDO to be portable, which enables their quick deployment over difficult terrain.

NATIONAL INVESTMENT AND INFRASTRUCTURE FUND (NIIF)

Recently, the National Investment and Infrastructure Fund has entered into a collaboration with Japan Bank for International Cooperation (JBIC) to unveil a \$600 million India-Japan Fund.



About National Investment and Infrastructure Fund:

- It is an investor-owned fund manager, **anchored by the Government of India (GoI)** in collaboration with leading global and domestic institutional investors.
- It is India's first-ever sovereign wealth fund (SWF) which was **set up in the year 2015**.
- It is an institution for enhancing infrastructure financing by **investing in greenfield (new), brownfield (existing) and stalled projects**.
- The primary goal of setting up NIIF was to **optimise the economic impact** largely through investing in **infrastructure-related projects**.
- **Types of NIIF Funds**
 - **Master Fund:** This fund primarily **invests in infra-related projects** such as roads, ports, airports, and power. Also, the master fund invests in well-established enterprises that are into a long-term agreement and are operating in a regulated environment with a good history.
 - **Fund of Funds:** It looks **to invest in funds managed by the renowned fund managers** having an excellent track record. The fund of funds invests as anchor investors, and this enables the fund managers to accumulate more funds from the institutional investors
 - **Strategic Fund:** This **fund is registered as an Alternative Fund II** under the Securities and Exchange Board of India (SEBI) in India. Strategic funds invest primarily in equity and equity-linked instruments.
- The funds are registered as **Alternative Investment Fund (AIF)** with the Securities and Exchange Board of India (SEBI).

WHAT IS GLACIAL LAKE OUTBURST FLOOD?

Recently, a glacial lake outburst flood in the South Lhonak Lake of Sikkim killed ten people and many Army personnel are missing.



About Glacial Lake Outburst Flood:

- **Glacial lakes** are large bodies of water that sit in front of, on top of, or beneath a melting glacier.
- As they grow larger, they become more dangerous because glacial lakes are mostly **dammed by unstable ice or sediment composed** of loose rock and debris.

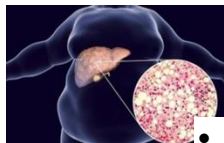
- In case the boundary around them breaks, **huge amounts of water rush down the side** of the mountains, which could cause flooding in the downstream areas. This is called glacial lake outburst floods or GLOF.
- It can be triggered by several reasons, including **earthquakes, extremely heavy rains and ice avalanches**
- These lakes are also often found in steep, mountainous regions, which means landslides or ice avalanches can sometimes fall directly into the lakes and displace the water, causing it to overtop the natural dam and flood downstream

Key facts about South Lhonak Lake

- This lake in **northern Sikkim** is situated about 5,200 metres above sea level.
- It formed due to the **melting of the glacier**.
- It is a moraine-dammed glacial lake at the snout of South Lhonak glacier, Sikkim Himalaya.
- It has become the largest and fastest-growing glacial lake in the state, with a glacial retreat of almost two kilometres in 46 years between 1962 and 2008.

WHAT IS NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD)?

Recent research revealed that Non-alcoholic fatty liver disease (NAFLD) is intrinsically linked with personality disorders.



About Non-Alcoholic Fatty Liver Disease (NAFLD):

- NAFLD is the **term for a range of conditions caused by a buildup of fat in the liver**.
- This buildup of fat is **not caused by heavy alcohol use**. When heavy alcohol use causes fat to build up in the liver, **this condition is called alcohol-associated liver disease**.
- **Two types of NAFLD are nonalcoholic fatty liver (NAFL) and nonalcoholic steatohepatitis (NASH)**.
- People **typically develop one type** of NAFLD or the other, although **sometimes people with one form are later diagnosed with the other form** of NAFLD.

- **NAFL:**
 - NAFL is a form of NAFLD in which you have fat in your liver but little or no inflammation or liver damage.
 - NAFL typically does not progress to cause liver damage or complications.
 - However, NAFL can cause pain from enlargement of the liver.
- **NASH:**
 - NASH is the form of NAFLD in which you have inflammation of the liver and liver damage, in addition to fat in your liver.
 - The inflammation and liver damage of NASH can cause fibrosis, or scarring, of the liver.
 - NASH may lead to cirrhosis, in which the liver is scarred and permanently damaged. Cirrhosis can lead to liver cancer.

Who is more likely to develop NAFLD?

- NAFLD is more common in people who have certain diseases and conditions, including obesity, and conditions that may be related to obesity, such as type 2 diabetes.
- NAFLD can affect people of any age, including children.
- **Treatment:**
 - There's currently no specific medication for NAFLD.
 - Doctors recommend weight loss to treat NAFLD.
 - Weight loss can reduce fat, inflammation, and fibrosis in the liver.
 - Treatment may also be recommended for associated conditions (high blood pressure, diabetes, and cholesterol) or complications.

2023 CHEMISTRY NOBEL PRIZE

Why in news?

- The 2023 Nobel Prize in chemistry was awarded to Mounqi G. Bawendi, Louis E. Brus and Alexei I. Ekimov for the discovery and synthesis of quantum dots.

- These nanoparticles have wide-ranging applications across fields like electronics, advanced surgery, and quantum computing.

- **Background**

- The properties of any element depend on how many electrons it has.
- However, when matter is tiny, of nano-dimensions, its properties depend on its size.
- The smaller a particle, the more its electrons are squeezed together, and that affects its properties.
 - This is because, at the scale of nanometres, quantum physical forces start to dominate.
 - At the macroscopic scale, on the other hand, gravity and the rules of classical physics dominate.
- Such particles, whose size determines their behaviour, are called quantum dots.

About

- Quantum dots are particles that are a few nanometres wide.
- They exhibit unique optical properties due to their small physical size.
- Their structure and atomic composition are the same as bulk materials, but the properties of the latter do not depend on their size.
- **Idea about the existence of such particle**
 - In theory, scientists had known for long that such particles could exist.
 - By the 1970s, physicists knew that the optical properties of glass could be changed by adding a small amount of another element, like gold, silver, cadmium, sulphur, or selenium.
 - They also knew how or why some of these changes could occur, but quantum dots as such had not been synthesised yet.

Modern-day applications

- **To light computer monitors and television screens**

- Today, one of the simplest applications of quantum dots is to light computer monitors and television screens.
 - Quantum dots are utilised in computer and television screens based on QLED technology, where the Q stands for quantum dot.
 - Blue LEDs behind the screen excite these dots, causing them to emit light of different colours.

- Combining these colours gives rise to even more colours as well as brightness.
 - Similarly, quantum dots are used in some LED lamps to adjust the cold light of the diodes.
 - The light can then become as energising as daylight or as calming as the warm glow from a dimmed bulb.
- **Biochemistry and medicine**
 - Nanoscale-sized quantum dots are also used to map biological tissues by biochemists.
 - Certain cancer treatments use quantum dots for targeted drug delivery and other therapeutic measures.
- Doctors have begun investigating the potential use of quantum dots to track tumour tissue in the body.
 - This has wider applications in the field of nanomedicine too.
- **Other applications**
 - Quantum dots are also used in photovoltaic cells to improve the absorption and efficiency in converting solar light into electricity.
 - Quantum dots can be used as security markers on currency and documents as an anti-counterfeit measure.
 - Broadly, they can be used as fluorescent markers to tag and track objects.

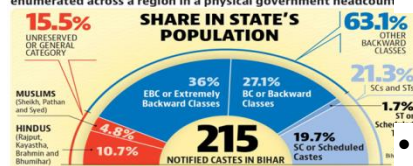
BIHAR, CASTE, AND SURVEY

Context

- Recently, the Bihar government released the **results of its survey of castes** in the state which put the **share of Extremely Backward Classes (EBCs) and Other Backward Classes (OBCs) cumulatively at more than 63%**.
- The survey, which has highlighted the exact caste breakup of Bihar, has **far-reaching implications on policy making and politics.**

What preliminary results show

This is the first time since independence that all castes have been enumerated across a region in a physical government headcount



Findings of Bihar Caste Survey

- **Forward castes:** According to the survey data (released by the

state Development Commissioner), the so-called forward castes or General category is only 15.5% of the total population (13.07 Cr).

- **SCs and STs:** There are about 20% (2.6 crore) Scheduled Castes (SCs), and just 1.7% (22 lakh) Scheduled Tribes (STs).
- **Minorities:** Muslims comprise 17.7% of the population and the other religious minorities have a minuscule presence.

Rationale Behind the Caste-Based Survey

- **Politics**
 - The survey was proposed by the JD(U), and part of the reason was it needed some rejuvenation in political field.
 - The CM of Bihar does not have a strong caste base. Even this survey shows that his caste, Kurmis, are under 3% of the population.
 - He needs more castes to rally behind him, and it is believed that the survey was born out of his personal political ambitions.
- **Inspiration from the Socialism of Ram Manohar Lohia**
 - The proponents of the survey (Nitish Kumar and Lalu Prasad Yadav), emerged from the JP movement, and their politics can be traced back farther to the socialism of Ram Manohar Lohia.
 - Lohia's social justice arguments were for better record of castes and therefore better representation of castes

Role of Mandal Commission Report in Rising Caste Consciousness in Bihar

- Even today in Bihar a government job was the lottery ticket to progress for most families and reservations was looked upon as a means to fundamentally transform the lives of many.
- The Mandal recommendations strengthened the already strong caste consciousness among the OBCs.
- On the other hand, Mandal also managed to solidify the bonds between the upper-castes as they came together to oppose the reservations.

How will the Caste Survey Translate into Better-designed Policies on the Ground?

- Reservations for Dalits for the post of Panchayat mukhiya (president) is based on the proportion of Dalits in a particular block (comprising 15 Gram Panchayats).
- If 20% of people in a block are Dalits, 20% of GP mukhiyas will be Dalit as well. While there has been similar reservation for EBCs at the Panchayat level, **the proportion of EBCs in a block was not known.**
- So, the government made a rule that **up to 20% of seats can be reserved for EBCs.**
- Now, **with this survey, the government has jatidata at a very fine geographical level, and the caste survey can rationalise policies such as this.**
- And such measures can have major long-term consequences for governance down the line.

Challenges Ahead for the Bihar Caste Survey

- **Legal Challenges**
 - The Caste survey has been challenged on the grounds that it **violates the SC's privacy judgement [K S Puttaswamy vs Union of India (2017)].**
 - The petitions argued that it is **actually a census in the garb of a survey, which is beyond the legislative competence of the state government.**
 - **It impinges upon the legislative power of the Union Parliament.** Also, the Census Act 1948 empowers only the Centre to conduct a census.
- **Will Reopen Debate on SC's 50% Quota Ceiling**
 - Underlining the need to ensure efficiency in administration, the SC in its 1992 decision in '**Indra Sawhney vs Union of India**' had fixed the 50% ceiling for reservation (which can be breached only in "exceptional circumstances").
 - **In 2021, a five judge Constitution bench of the SC unanimously struck down a Maharashtra law** (which provides reservation to the Maratha community) as unconstitutional, holding the total quota limit would exceed 50%.
 - However, **a five-judge bench (in a 3:2 majority) of the SC upheld the 10% EWS quota,** which also breached the 50% ceiling. The court held that the ceiling was for backward classes.