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USA Redesignates Cuba as State Sponsor of Terrorism

Why in News

Recently, the USA State Department has designated Cuba as a **State Sponsor of Terrorism** for repeatedly providing **support for acts of international terrorism** in granting safe harbour to terrorists.



Key Points

- **Provisions for sanctions on countries:**
 - The State Department of the USA can place **four categories** to enlist any country as sanctioned:
 - Restrictions on foreign assistance by the USA.
 - A ban on defence exports and sales.
 - Certain controls over exports of dual use items.
 - Sanctions can also be placed on countries and persons that engage in certain trade with designated countries.
 - Four countries remain on the list: **Syria, Iran, North Korea and Cuba.** Cuba was delisted in 2015 and has been blacklisted again.
- **Cuba Designated as a State Sponsor of Terrorism:** The USA government had been accusing the Castro regime for:
 - Illegitimate interference in internal politics Venezuela.
 - Oppressing the people of Cuba.
 - Supporting international terrorism.
 - Subversion of the USA justice.

- **USA-Cuba Relationship:**
 - The United States and Cuba have had a strained relationship for more than sixty years, rooted in Fidel Castro’s overthrow of a USA-backed government in 1959.
 - Presidents Barack Obama and Raul Castro took several steps to normalize bilateral relations, including restoring diplomatic ties and expanding travel and trade.
 - The Trump administration has reversed aspects of the past agreements by reimposing restrictions on tourism and other commerce.
 - **Havana Syndrome:**
 - In late 2016, USA diplomats and other employees stationed in Havana (capital of Cuba) reported feeling ill after hearing strange sounds and experiencing odd physical sensations.
 - The symptoms included nausea, severe headaches, fatigue, dizziness, sleep problems, and hearing loss, which have since come to be known as the **Havana Syndrome**. The USA had accused Cuba of carrying out “attacks”, but Cuba denied any knowledge of the illnesses.
- **Historical Reasons for Strained Relationship:**
 - **Cuban Revolution:** The tumultuous USA-Cuba relationship has its roots in the Cold War. In 1959, Fidel Castro and a group of revolutionaries seized power in Havana (city capital of Cuba). They overthrew the USA-backed government of Fulgencio Batista.
 - **Cuban Missile Crisis:**
 - The United States **severed diplomatic ties with** Cuba and began pursuing covert operations to overthrow the Fidel Castro regime in 1961.
 - The missile crisis arose after **Cuba allowed the Soviet Union to secretly install nuclear missiles** on the island following an attempt by the USA agencies to topple Cuban Government, known as the **Bay of Pigs invasion**.
 - In the end, Soviet Union head Khrushchev agreed to withdraw the missiles in exchange for a pledge from Kennedy (USA) not to invade Cuba and to remove the USA nuclear missiles from Turkey.
 - **Trade with Soviet Union:** After the Cuban Revolution, the United States recognized Fidel Castro’s government but began imposing economic penalties as the new regime increased its trade with the Soviet Union, nationalized American-owned properties, and hiked taxes on the USA imports.
 - **Embargo by Kennedy Government (1962):** After slashing Cuban sugar imports, the USA instituted a ban on nearly all its exports to Cuba, which President John F. Kennedy expanded into a full economic embargo that included stringent travel restrictions.

- **India's Stand:**
 - **Supports Lifting Economic Blockade of Cuba:** Recently when the USA opposed Cuba's membership in UNHRC in 2019, India joined the majority of countries from all continents that raised their voices in the UN General Assembly to demand an end to the unjust and long economic blockade of the United States against Cuba.
 - **Criticised the USA Embargo:** In the UN General Assembly, India stressed that the continued existence of this siege by the USA against Cuba contravenes world opinion, undermines multilateralism and the credibility of the United Nations.
- **UN General Assembly's Stand:**

Since 1992, the UN General Assembly has approved every year a resolution acknowledging the necessity of ending the economic, commercial and financial blockade imposed by the United States of America against Cuba.

Way Forward

- **Reinitiating Bilateral Talks:** Resuming Washington's blockade against Cuba appears to be the most unjust, prolonged system of unilateral sanctions applied against any country. There is an urgent need to improve the relationship between the two countries through bilateral talks.
- **Respecting the Spirit of Democracy:** As a large population of Cuban immigrants and people with Cuban roots reside in the USA, it is for the sake of democracy and spirit of internationalism that the two countries make efforts towards reconciliation.
- **For India:** India has good ties with both the countries. If the tension between the two - USA and Cuba escalates, it is important for India to rationally balance the relationships.

Source: IE

Special Marriage Act, 1954

Why in News

Recently, the **Allahabad High Court** has struck down the provisions under **Section 5 of the Special Marriage Act** that required parties to give a 30-day mandatory public notice of their intention to marry.

Key Points

- **Special Marriage Act (SMA), 1954:**
 - The Special Marriage Act is a **central legislation** made to **validate and register interreligious and inter-caste marriages in India.**
 - It allows two individuals to solemnise their marriage through a **civil contract.**
 - **No religious formalities** are needed to be carried out under the Act.
- **Provisions of the Special Marriage Act:**
 - **Section 4:** There are **certain conditions** laid down in Section 4 of the Act:
 - It says that neither of the parties should have a spouse living.
 - Both the parties should be **capable of giving consent**; should be sane at the time of marriage.
 - The parties shall **not be within the prohibited degree of relations** as prescribed under their law.
 - While **considering the age**, the **male must be at least 21 and the female be 18 at least.**
 - **Section 5 and 6:**
 - Under these sections, the parties wishing to marry are **supposed to give a notice for their marriage** to the Marriage Officer in an area where one of the spouses has been **living for the last 30 days.** Then, the marriage officer publishes the notice of marriage in his office.
 - **Anyone having any objection to the marriage** can file against it within a period of 30 days. If any such objection against the marriage is sustained by the marriage officer, the marriage can be rejected.

- **Details of the verdict**
 - **Observations:**
 - The **provision for mandatory publication of notice**, derived through “simplistic reading” of the particular law, “would **invade the fundamental rights of liberty and privacy**, including within its sphere freedom to choose for marriage without interference from state and non-state actors, of the persons concerned”.
 - The court also noted that despite the secular law for marriage, a majority of marriages in the country happen as per religious customs. It said that **when marriages under personal law do not require a notice or invitation for objections, such a requirement is obsolete in secular law** and cannot be forced on a couple.
 - **Publishing marriage details made optional:** The court made it optional for the parties to the intended marriage to make a request in writing to the Marriage Officer to publish or not to publish a notice under Section 5 and 6 of the Act of 1954.
 - **Directives for Marriage officer:** In case the parties do not make such a request for publication of notice in writing, the Marriage Officer shall not publish any such notice or entertain objections to the intended marriage and proceed with the solemnization of the marriage. However, in case the officer has any doubt, he could ask for appropriate details/proof as per the facts of the case.
- **Basis of Judgement is progressive rulings by the Supreme Court:**
 - **Aadhaar case (2017)** which made the **right to privacy** a fundamental right under **Article 21** of the Constitution of India.
 - **Hadiya Marriage Case (2018)** which held that the **right to choose a partner is a fundamental right**.
 - **Navtej Singh Johar vs. Union of India case (2018)** in which the court decriminalised homosexuality striking down the **Section 377 of IPC**.
- **Benefits of the verdict**
 - It would **decrease the cases of conversion for marriage**, as the delay under the special marriage Act 1954 was forcing many couples to marry by converting.
 - It shall **remove hindrances to inter-faith and inter-caste marriages**, and thus could promote ideals of **secularism and egalitarianism**.
 - It shall provide **relief to interfaith couples from being targeted by vigilante groups**.
- **Issue related to the verdict:**
 - Doing away with the public notification of the marriage **could increase the cases of cheating**, for example cases of duping by a married spouse.
 - It can facilitate anti social activities such as forceful conversion.

Source: IE

Lumpy Skin Disease

Why in News

Recently, a **Lumpy Skin Disease (LSD)** has been infecting India's bovines.

The disease is being reported for the **first time in India**.

Key Points

- **Cause:**
 - The LSD is caused by infection of cattle or water buffalo with the **poxvirus Lumpy skin disease virus (LSDV)**.
 - The virus is one of three closely related species within the genus **capripoxvirus**, the other two species being **Sheeppox virus and Goatpox virus**.
- **Symptoms:**
 - It appears as **nodules of two to five centimetre diameter** all over the body, particularly around the **head, neck, limbs, udder (mammary gland of female cattle) and genitals**.
 - The lumps gradually open up like large and deep wounds.
 - Other clinical signs include **general malaise, ocular and nasal discharge, fever, and sudden decrease in milk production**.
- **Effect:**

According to the **Food and Agriculture Organization (FAO)** the mortality rate is less than 10%.
- **Vectors:**

It spreads through **mosquitoes, flies and ticks** and also through **saliva and contaminated water and food**.
- **Prevention:**

Control and prevention of lumpy skin disease relies on four tactics - **movement control (quarantine), vaccination, slaughter campaigns and management strategies**.
- **Treatment:**

There is **no treatment for the virus**, so **prevention by vaccination** is the most effective means of control.

Secondary infections in the skin may be **treated with Non-Steroidal Anti-Inflammatories (NSAIDs)** and also **antibiotics** when appropriate.

- **Global Spread:**

- LSD is endemic to **Africa and parts of West Asia**, where it was first **discovered in 1929**.
- In Southeast Asia the first case of LSD was reported in **Bangladesh in July 2019**.
- In India, which has the **world's highest 303 million heads of cattle**, the disease has spread to **15 states within just 16 months**.
In India it was first reported from **Mayurbhanj, Odisha in August 2019**.

- **Implication:**

This will have a **devastating impact on the country**, where most dairy farmers are either landless or marginal landholders and **milk is among the cheapest protein sources**.

Source:DTE

Nanobodies

Why in News

An international research team led by the University of Bonn (Germany) has identified and further **developed novel antibody fragments (nanobodies) against SARS-CoV-2**, the virus that causes Covid-19.

Key Points

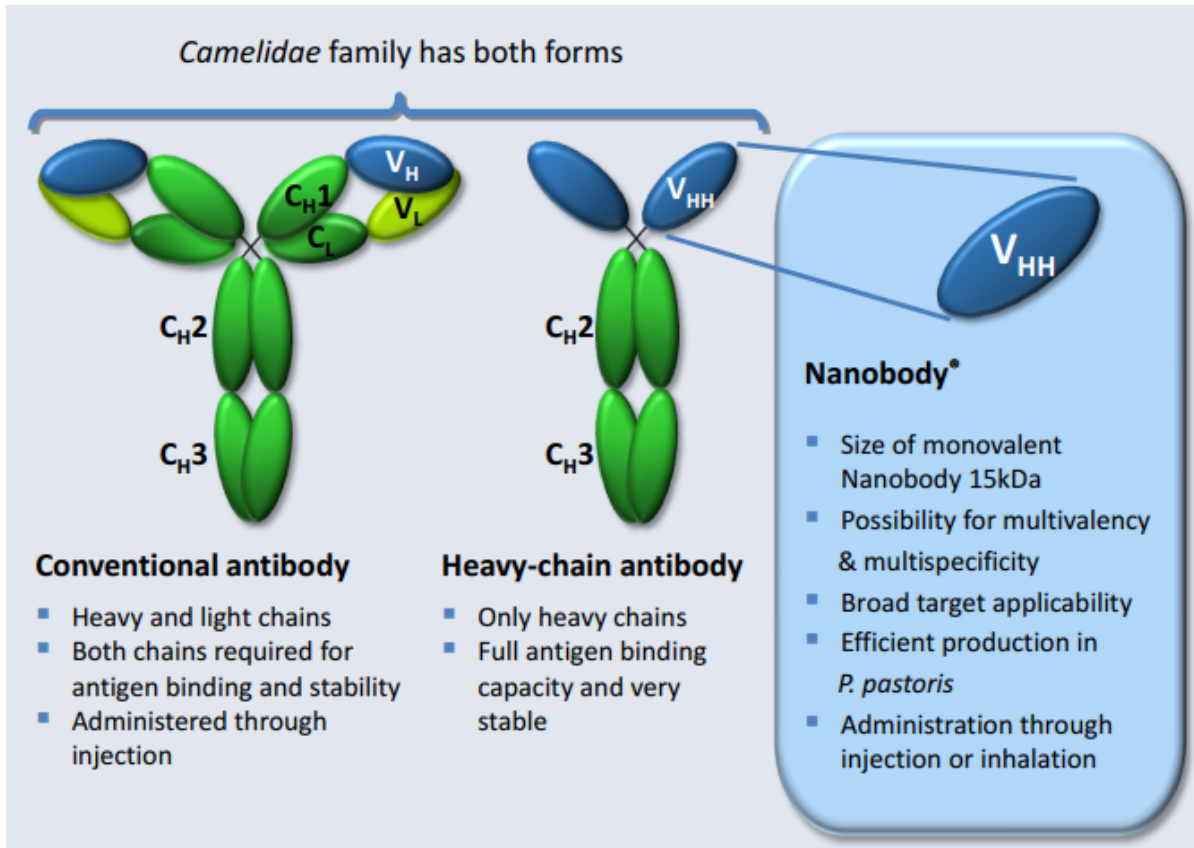
- **Nanobodies Against SARS-CoV-2:**

- **Produced along with Antibodies:** On injection of surface protein of the coronavirus into an alpaca and a llama, their immune system not only produced antibodies directed against the virus but also a simpler antibody variant that can serve as the basis of nanobodies.
- **More Effective:**
 - They had also **combined the nanobodies into potentially particularly effective molecules**, which **attack different parts of the virus simultaneously**. This new approach **could prevent the pathogen from evading the effect of antibodies through mutations**.
 - Nanobodies **appear to trigger a structural change** before the virus encounters its target cell - an unexpected and novel mode of action. The change is likely to be irreversible; the virus is therefore no longer able to bind to host cells and infect them.

- **Antibodies:**
 - Antibodies are **an important weapon in the immune system's defense against infections.**
 - They **bind to the surface structures of bacteria or viruses and prevent their replication.**
 - One strategy in the fight against disease is therefore to produce effective antibodies in large quantities and inject them into patients. However, **producing antibodies is difficult and time-consuming;** they are, therefore, **probably not suitable for widespread use.**
- **Nanobodies:**
 - Nanobodies are **antibody fragments** that are so simple that they **can be produced by bacteria or yeast, which is less expensive.**
 - These are **antibodies with a single variable domain located on a heavy chain,** also known as **VHH antibodies.**
 - These are **often seen as an alternative to conventional antibodies,** and have **significant differences** in both **production** and **use** that influence their suitability.
- **Difference between Nanobodies and Conventional Antibodies:**

Difference in Structure and Domains:

 - **Conventional antibodies** have **two variable domains, called VH and VL,** which offer each other stability and binding specificity.
 - **Nanobodies have VHH domains and lack VL domains,** but are still highly stable. Lacking the VL domain also means nanobodies have a **hydrophilic** (having a tendency to dissolve in a water) side.
 - Hydrophilic side means they **do not have issues with solubility and aggregation** otherwise associated with conventional antibodies.
 - Nanobody production follows many of the same protocols as used in traditional antibody production. However, it also has distinct advantages not available with traditional antibodies, such as **improved screening, improved isolation techniques, and no animal sacrifice.**



- **Use:**

- **Nanobodies** are much smaller than classic antibodies and they, therefore, **penetrate the tissue better** and can be produced more easily in **larger quantities**.
- **Nanobodies** are **stable in a wide range of temperatures**, remaining functional at temperatures as high as 80°C. As an added bonus, **unfolding of the nanobody due to high temperatures** has been shown to be **fully reversible, unlike conventional antibody fragments**.
Nanobodies are **also stable at extreme pH levels**, able to survive exposure to gastric fluid.
- **Nanobodies** are also **compatible with genetic engineering methods**, which allow alteration of amino acids to improve binding.

- **Limitations of Nanobodies:**

Monoclonal and polyclonal antibodies are slightly **safer to produce than nanobodies**, as there are biohazards involved in nanobody production not present for conventional antibody production.

The biohazards result mainly from **use of hazardous bacteriophages** (any of a group of viruses that infect bacteria) for selection of nanobodies. Other sources include plasmids, antibiotics, and recombinant DNA. These materials require safe disposal.

- **Polyclonal antibodies** are made using several different immune cells.
- **Monoclonal antibodies** are made using identical immune cells that are all clones of a specific parent cell.

Source: IE

LCA Tejas

Why in News

The **Cabinet Committee on Security** (CCS) has recently cleared a deal worth Rs. 48,000 crore for the acquisition of **83 Tejas Light Combat Aircraft** for the Indian Air Force.

83 Tejas includes **73 LCA Tejas Mk-1A fighter aircraft** and **10 LCA Tejas Mk-1 trainer aircraft**. **MK-1A variant** is a improved version of MK-1 with an **electronic warfare system, advanced electronically scanned array (AESA) radar, beyond visual range (BVR) missiles and** a network warfare system comprising **software defined radio (SDR)**

Cabinet Committee on Security

- CCS is chaired by the **Prime Minister** of India.
- Major decisions with respect to the **significant appointments, issues of national security, defence expenditure of India are taken by the Cabinet Committee on Security (CCS)**.

Key Points

About:

- The **Light Combat Aircraft (LCA)** programme was started by the **Government of India in 1984** when they established the **Aeronautical Development Agency (ADA)** to manage the **LCA programme**.
- It replaced the ageing **Mig 21 fighter planes**.
- **Designed by:**
Aeronautical Development Agency under the **Department of Defence Research and Development**.
- **Manufactured by:**
State-owned **Hindustan Aeronautics Limited (HAL)**.
- **Features:**
 - The **lightest, smallest and tailless multi-role supersonic fighter** aircraft in its class.
 - Designed to **carry a range of air-to-air, air-to-surface, precision-guided**, weapons.
 - **Air to air refuelling capability**.
 - Maximum **payload capacity of 4000 kg**.
 - It can attend the maximum speed of **Mach 1.8**.
 - The range of the aircraft is **3,000km**
- **Variants of Tejas:**
 - **Tejas Trainer:** 2-seater operational conversion trainer for training air force pilots.
 - **LCA Navy:** Twin- and single-seat carrier-capable for the Indian Navy.
 - **LCA Tejas Navy MK2:** This is phase 2 of the LCA Navy variant.
 - **LCA Tejas Mk-1A:** This is an improvement over the LCA Tejas Mk1 with a higher thrust engine.

Source:TH

Two Dimensional Electron Gas

Why in News

Scientists at **Institute of Nano Science and Technology (INST)**, Mohali, Punjab have produced an **ultra-high mobility Two dimensional (2D)-electron gas (2DEG)**.

Key Points

- **Two Dimensional Electron Gas (2DEG):**

- It is an electron gas that is free to move in **two dimensions**, but tightly **confined in the third**. This tight confinement leads to **quantized energy levels for motion in the third direction**. Thus the electrons appear to be a **2D sheet embedded in a 3D world**.
- One of the most important recent developments in **semiconductors**, has been the achievement of structures in which the electronic behavior is essentially **two-dimensional (2D)**.
- Most 2DEGs are found in **transistor-like structures** made from **semiconductors**.
- 2DEG is a valuable system for exploring the physics of **superconductivity magnetism and their coexistence**.

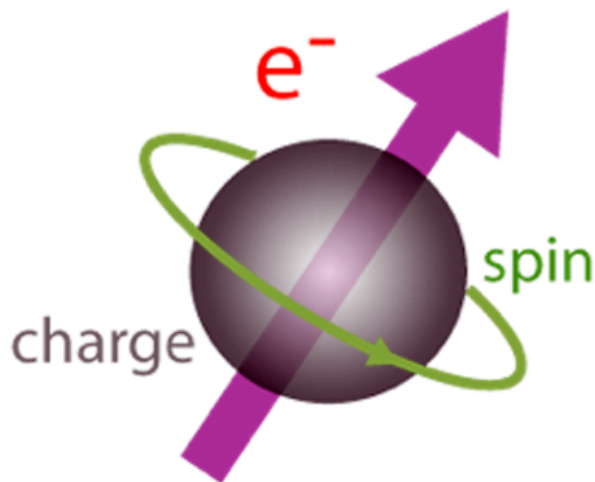
Superconductivity is a phenomenon whereby a **charge moves through a material without resistance**. In theory this **allows electrical energy to be transferred between two points** with perfect efficiency, losing **nothing to heat**.

- **Cause for Development of 2DEG:**

- The need for attaining new functionalities in modern electronic devices has led to the **manipulation of property of an electron called spin degree of freedom along with its charge**. This has given rise to an altogether new field of spin-electronics or ‘**spintronics**’.
- The manipulation of **electron spin** offers **new dimensions for basic and applied research**, and the potential for **new capabilities for electronics technology**. This motivates studies of spin polarized electrons in a **high mobility two dimensional electron gas (2DEG)**.

Spintronics is the study of the **intrinsic spin of the electron** and its associated **magnetic moment**, in addition to its fundamental electric charge, in solid-state devices.

Spintronics



- It has been realized that a phenomenon called the ‘**Rashba effect**’, which consists of splitting of spin-bands in an electronic system, might play a key role in spintronic devices.

Rashba Effect: Also called **Bychkov–Rashba effect**, it is a **momentum-dependent splitting of spin bands** in bulk crystals and low-dimensional condensed matter systems.

- **Mechanism and Importance:**

- Due to the **high mobility of the electron gas**, electrons **do not collide** inside the medium for a **long distance** and hence **do not lose the memory and information**.

Hence, it can speed up transfer of quantum information and signal from one part of a device to another and increase data storage and memory.

- Since they collide **less during their flow**, **their resistance is very low**, and **hence they don’t dissipate energy as heat**.

So, such devices **do not heat up easily and need less input energy** to operate.

Harvest Festivals in India

Why in News

The harvest festivals like **Lohri, Makar Sankranti and Pongal** have recently been **celebrated all across the country.**

Key Points

- **Makar Sankranti:**
 - Makar Sankranti denotes the entry of the sun into the zodiac sign of Makara (Capricorn) as it travels on its celestial path.
 - The day marks the onset of summer and the **six months auspicious period for Hindus known as Uttarayan**, the northward movement of the sun.
 - As a part of the official celebration of '**Uttarayan**', the Gujarat government has been hosting the **International Kite Festival since 1989.**
 - The festivities associated with the day are known by different names in different parts of the country - **Lohri by north Indian Hindus and Sikhs, Sukarat in central India, Bhogali Bihu by Assamese Hindus, and Pongal by Tamil and other South Indian Hindus.**
- **Lohri:**
 - Lohri is primarily celebrated by **Sikhs and Hindus.**
 - It marks the end of the winter season and is traditionally believed to welcome the sun to the northern hemisphere.
 - It is observed **a night before Makar Sankranti**, this occasion involves a **Puja Parikrama (revolve)** around the bonfire with prasad.
 - It is essentially termed as the festival of the farmers and harvest, whereby, the farmers thank the Supreme Being.
- **Pongal**
 - The word Pongal means '**overflow**' or '**boiling over**'.
 - Also known as Thai Pongal, the four-day occasion is **observed in the month of Thai**, when crops such as rice are harvested and people show their gratitude to the almighty and the generosity of the land.
 - Tamilians celebrate the occasion by making **traditional designs known as kolams** in their homes with rice powder.

- **Bihu**
 - It is celebrated when the **annual harvest takes place in Assam**. People celebrate **Rongali/Magh Bihu** to mark the **beginning of the Assamese new year**.
 - It is believed that the festival started from the time when people of the valley **started tilling the land**. Bihu is believed to be as old as **river Brahmaputra**.
- **Makaravilakku festival in Sabarimala:**
 - It is celebrated at the sacred grove of Lord Ayyappa at Sabarimala.
 - It is an **annual seven-day festival**, beginning on the day of Makar Sankranti when the sun is in the summer solstice.
 - The highlight of the festival is the appearance of Makarajyothi- a celestial star which appears on the day of Makar Sankranti on top of **Kantamala Hills**.
 - Makara Vilakku ends with the ritual called '**Guruthi**', an offering made to appease the god and goddesses of the wilderness.



Maghi Mela

Why in News

For the first time in over several decades there will be no political conferences at the historic **Maghi Mela**.

Maghi Mela is held in **Muktsar, Punjab** every year in January or in the month of Magh according to the **Nanakshahi calendar**.

Nanakshahi calendar was **designed by Sikh scholar Pal Singh Purewal** to replace the Bikrami calendar, **to work out the dates of gurpurab and other festivals**.

Key Points

- **About Maghi :**
 - Maghi is the **occasion when Sikhs commemorate the sacrifice of forty Sikhs**, who fought for **Guru Gobind Singh Ji**.
 - The **eve of Maghi** is the **common Indian festival of Lohri** when bonfires are lit in Hindu homes to greet the birth of sons in the families and alms are distributed.
- **Significance**

The day of Maghi is observed to **honour the heroic fight of the Chali Mukte, or the Forty Liberated Ones**, who **sacrificed their own lives defending** an attack by the Mughal imperial army marching in pursuit of **Guru Gobind Singh**.
- **Historical Background:**
 - The battle took place near a pool of water, Khidrane di Dhab, on **29th December 1705**.
 - The **bodies were cremated the following day**, the first of Magh (hence the name of the festival), which now falls usually on the 13th of January.
 - Following the custom of the Sikhs to observe their anniversaries of happy and tragic events alike, **Maghi is celebrated with end-to-end recitals of the Guru Granth Sahib and religious divans** in almost all gurdwaras.

Source: IE
