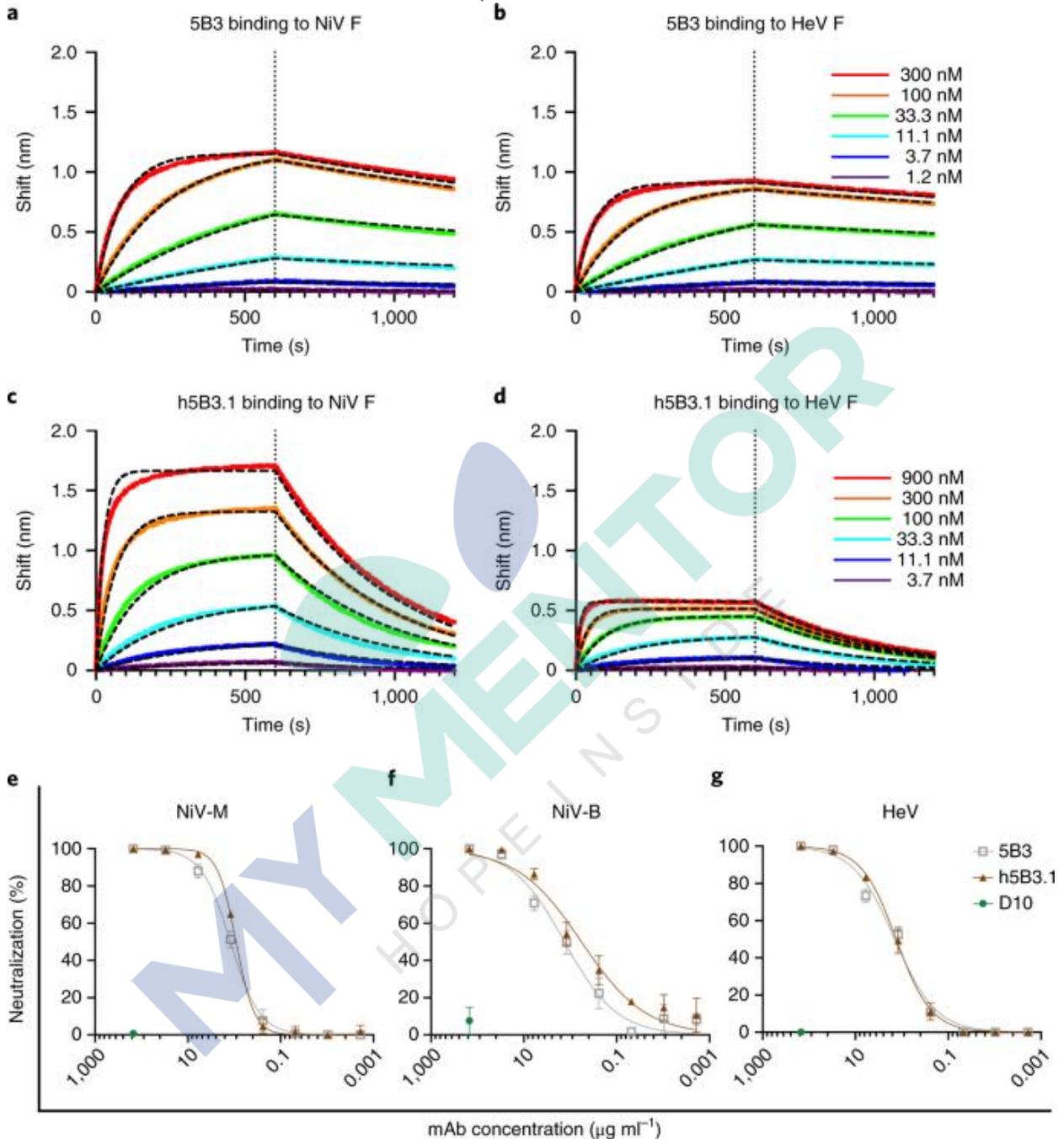


SCIENTISTS DETECTED THE PRESENCE OF IGG ANTIBODIES AGAINST NIV

GS Paper - 2 - Health



**WHY IN NEWS?**

Recently, Scientists detected the presence of IgG antibodies against Nipah virus infection (NiV) in 51 bats that were captured from Karnataka, Kerala, Tamil Nadu and Puducherry.

**WHAT IS ANTIBODY?**

- Antibody, also called immunoglobulin, is a protective protein produced by the immune system in response to the presence of a foreign substance, called an antigen.
- A wide range of substances are regarded by the body as antigens, including disease-causing organisms and toxic materials.

- Antibodies recognize and attack onto antigens in order to remove them from the body.

What are the Different Types of Antibodies?

- IgG:**
  - It is the **main antibody in blood and it has a powerful ability to bind to bacteria** and toxins, and thus it takes on an important role in the biological defense system.
  - It is the **only isotype that can pass through the placenta**, and IgG transferred from the mother's body protects a newborn.
- IgM:**
  - It is **constructed of five units of basic Y-shaped structures** and is mainly distributed to the blood. Produced first upon pathogen invasion by B cells, IgM has a key role in the initial immune system defense for protecting the body.
    - The B-cell, also called B-lymphocyte, is a type of white blood cell that plays a significant role in protecting your body from infection.
- IgA:**
  - While in blood, **IgA is mainly present as monomers** (the shape of a single Y), but it forms dimers (a combination of 2 Ys) in secretions such as bowel fluid, nasal discharge, and saliva, to prevent bacterial invasion from a mucous membrane. It is also present in breast milk and protects the gastrointestinal tract of newborns from bacterial and viral infection.
- IgD:**
  - It is **present on the surface of B cells** and it is reported to play a role in the induction of antibody production and the prevention of respiratory tract infections.
- IgE:**
  - It is believed that **IgE was originally related to immunity reactions to parasites**. By binding to mast cells, **IgE is believed to be involved in allergies such as pollinosis**.

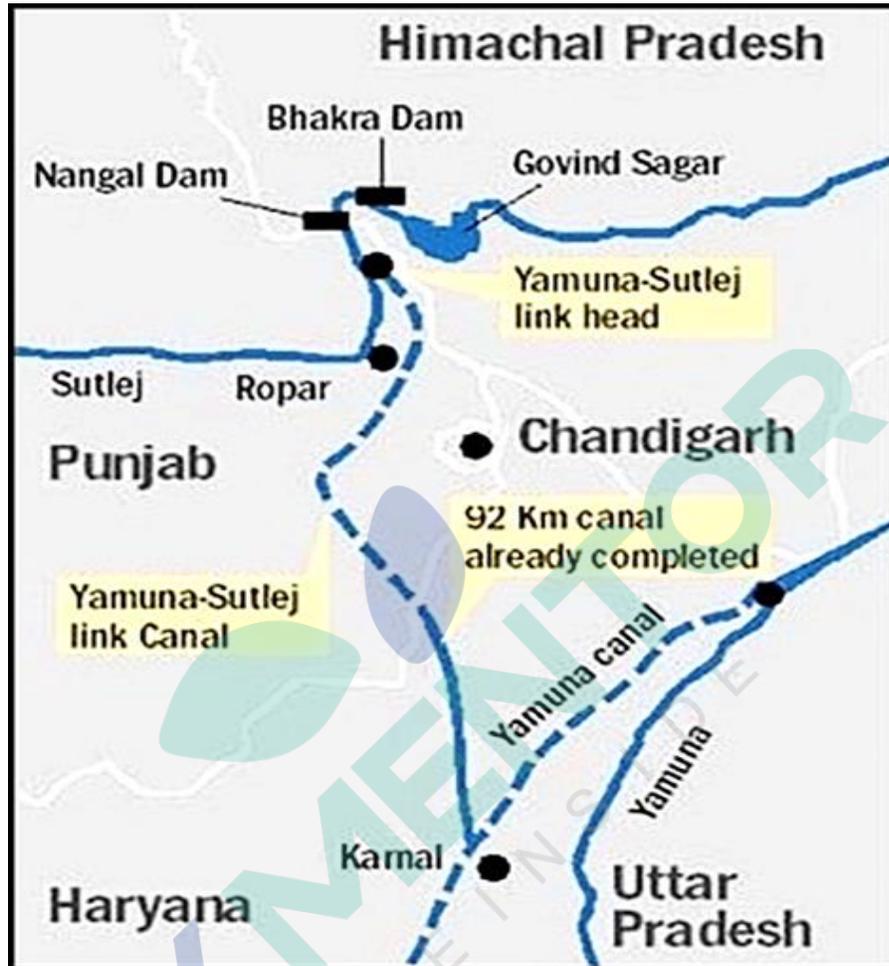
### WHAT ARE THE KEY HIGHLIGHTS ABOUT THE NIPAH VIRUS?

- About:**
  - It is a **zoonotic virus** (it is transmitted from animals to humans).
  - The organism which causes Nipah Virus encephalitis is an RNA or **Ribonucleic acid virus** of the family Paramyxoviridae, genus Henipavirus, and is closely related to Hendra virus.
    - Hendra virus (HeV) infection** is a rare emerging zoonosis that causes severe and often fatal disease in both infected horses and humans.
  - It **first broke out in Malaysia and Singapore** in 1998 and 1999.
  - It **first appeared in domestic pigs** and has been found among several species of domestic animals including dogs, cats, goats, horses and sheep.
- Transmission:**
  - The disease spreads through **fruit bats** or 'flying foxes,' of the genus Pteropus, who are natural reservoir hosts of the Nipah and Hendra viruses.
  - The **virus is present in bat urine** and potentially, bat faeces, saliva, and birthing fluids.
- Symptoms:**
  - The human infection presents as an **encephalitic syndrome** marked by fever, headache, drowsiness, disorientation, mental confusion, coma, and potentially death.
- Prevention:**
  - Currently, there are **no vaccines for both humans and animals**. Intensive supportive care is given to humans infected by Nipah virus.

Source:IE

**SUTLEJ YAMUNA LINK (SYL) CANAL**

*GS Paper - 1 - GS Paper - 2 - Inter-State Relations - Dispute Redressal Mechanisms - Tribunals - Water Resources*



**WHY IN NEWS?**

Recently, the Haryana Vidhan Sabha has passed a resolution seeking completion of the **Sutlej Yamuna Link (SYL) Canal**.

- The canal, once completed, will **enable sharing of the waters of the rivers Ravi and Beas** between Haryana and Punjab.
- The **Satluj Yamuna Link Canal** is a **proposed 214-kilometre-long canal** connecting Sutlej and Yamuna rivers.
- **Water resources are under the State List**, while the **Parliament has the power to make laws regarding inter-state rivers under the Union List**.

**WHAT IS THE BACKGROUND?**

- **1960:** The dispute can be traced back to the **Indus Water Treaty** between India and Pakistan, allowing the former 'free and unrestricted use' of Ravi, Beas and Sutlej.
- **1966:** Creation of Haryana from the old (undivided) Punjab presented the problem of giving Haryana its share of river waters.
  - **For Haryana to get its share of the waters of the Sutlej and its tributary Beas**, a canal linking the Sutlej with the Yamuna was planned (SYL Canal).

- **Punjab refused to share waters with Haryana stating it was against the riparian principle** which dictates that the water of a river belongs only to the State and country or States and countries through which the river in question flows.
- **1981:** Both states mutually **agreed for the re-allocation of water.**
- **1982:** Construction of **214-km SYL was launched in Kapoori village, Punjab.**
  - Agitations, protests and assassinations were carried out in protest creating the environment of terrorism in the state and making the issue of national security.
- **1885:**
  - Prime Minister Rajiv Gandhi and then Akali Dal chief Sant signed an accord agreeing for a new tribunal to assess the water.
  - The **Eradi Tribunal** headed by Supreme Court Judge V Balakrishna Eradi was set up to reassess availability and sharing of water.
  - In 1987, the tribunal recommended an increase in the shares of Punjab and Haryana to 5 MAF and 3.83 MAF, respectively.
- **1996:** Haryana moved the **Supreme Court (SC)** seeking directions to Punjab to complete the work on the SYL.
- **2002 and 2004:** SC directed Punjab to complete the work in its territory.
- **2004:** Punjab Assembly passed the **Punjab Termination of Agreements Act**, terminating its water-sharing agreements and thus jeopardising the construction of SYL in Punjab.
- **2016:** SC started hearings into a presidential reference (**Article 143**) to decide on the legality of the 2004 Act and **declared that Punjab backed out of its promise to share the waters of rivers.** Thus, the act was **termed constitutionally invalid.**
- **2020:**
  - **SC directed the Chief Ministers of both states to negotiate and settle the SYL canal issue** at the highest political level to be mediated by the Centre.
  - Punjab has asked for a tribunal for fresh time-bound assessment of the water availability.
    - Punjab holds that there has been no adjudication or scientific assessment of river waters in the state till date.
    - The **availability of Ravi-Beas water has also come down** from the estimated 17.17 MAF in 1981 to 13.38 MAF in 2013. A fresh tribunal would ascertain all this.

#### WHAT IS THE ARGUMENT OF PUNJAB AND HARYANA?

- **Punjab:**
  - Many areas in **Punjab may go dry after 2029** and the state has **already over-exploited its groundwater for irrigation purposes** as it fills granaries of the Centre by growing wheat and paddy worth Rs 70,000 crore every year.
    - **Water in about 79% of the state's area is over-exploited** and in such a situation, the government says **sharing water with any other state is impossible.**
- **Haryana:**
  - It says that providing irrigation is tough for the state and there was a **problem of drinking water in southern parts of Haryana**, where groundwater has depleted up to 1,700 feet.

- Haryana has been **citing its contribution to the central food pool** and arguing that **it is being denied its rightful share in the water** as assessed by a tribunal.

### WHAT ARE THE KEY HIGHLIGHTS ABOUT SUTLEJ AND YAMUNA RIVER?

#### ○ Sutlej:

- The ancient name of **Sutlej River** is **Zaradros (Ancient Greek) Shutudri or Shatadru (Sanskrit)**.
- It is the **longest of the five tributaries of the Indus River** that give the Punjab (meaning “Five Rivers”) its name.
  - Jhelum, Chenab, Ravi, Beas and Satluj are main tributaries of Indus.
- It rises on the **north slope of the Himalayas** in Lake La’nga in southwestern Tibet.
  - Flowing northwestward and then west-southwestward through Himalayan gorges, it enters and crosses Himachal Pradesh before beginning its flow through the Punjab plain near Nangal.
  - Continuing southwestward in a broad channel, it receives the Beas River (and forms 65 miles of the India-Pakistan border before entering Pakistan and flowing another 220 miles to join the Chenab River west of Bahawalpur.
    - Sutlej River meets the Beas River in Harike in the Ferozpur district before entering Pakistan.
  - The combined rivers then form the Panjnad, the link between the Five Rivers and the Indus.
- **Luhri Stage-I Hydro Electric Project** is located on River Satluj in Shimla and Kullu districts of Himachal Pradesh.

#### ○ Yamuna:

- **Source:** The river Yamuna, a **major tributary of river Ganges**, originates from the Yamunotri glacier near Bandarpooch peaks in the Mussoorie range of the lower Himalayas at an elevation of about 6387 meters above mean sea level in Uttarkashi district of Uttarakhand.
- **Basin:** It meets the Ganges at the Sangam (where **Kumbh** mela is held) in **Prayagraj, Uttar Pradesh** after flowing through **Uttarakhand**, Himachal Pradesh, Haryana and Delhi.
- **Length:** 1376 km
- **Important Dam:** Lakhwar-Vyasi Dam (Uttarakhand), Tajewala Barrage Dam (Haryana) etc.
- **Important Tributaries:** **Chambal**, Sindh, **Betwa and Ken**.

### WAY FORWARD

- The water disputes **can be solved or balanced by having a permanent tribunal** established with appellate jurisdiction of the Supreme Court established over the tribunal’s decision.
- The immediate target of any Constitutional Government **should be amendment to Article 262** (Adjudication of disputes relating to waters of inter State rivers or river valleys) **and amendment to Inter-State Water Disputes Act** and its implementation at the equal note.

**Source:IE**

## NOMADIC AND SEMI-NOMADIC TRIBES IN INDIA

GS Paper - 2 - Issues Related to SCs & STs - Government Policies & Interventions

# DENOTIFIED TRIBES - MEANING

- **DE notified Tribes (DNTs)**, also known as **Vimukta Jati**, are the tribes that were originally listed as "Criminal Tribes" and "addicted to the systematic commission of non-bailable offences."
- Once a tribe became "notified" as criminal, all its members were required to register with the local magistrate, failing which they would be charged with a "crime" under the Indian Penal Code.



### WHY IN NEWS?

Recently, the **standing committee of Parliament** has criticised the functioning of the development programme for **de-notified, nomadic and semi-nomadic tribes**.

- The committee noted that the Scheme for **economic empowerment of Denotified Tribes (DNTs) communities** has total outlays of Rs 200 crore for the period of **five years from 2021-22** and the **Department could not spend even a single rupee in 2021-22**.

### WHO ARE DE-NOTIFIED, NOMADIC AND SEMI-NOMADIC TRIBES?

- These are communities that are the **most vulnerable and deprived**.
- DNTs are communities that were '**notified**' as being '**born criminals**' during the British regime under a series of laws starting with the **Criminal Tribes Act of 1871**.
  - These Acts were repealed by the **Independent Indian Government in 1952**, and these communities were "**De-Notified**".
- A few of these communities which were listed as **de-notified were also nomadic**.
  - **Nomadic** and semi-nomadic communities are defined as **those who move from one place to another rather than living in one place all the time**.
- Historically, **Nomadic Tribes and De-notified Tribes** never had access to private land or home ownership.
- While most DNTs are spread across the **Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backward Classes (OBC) categories**, some DNTs are not covered in any of the SC, ST or OBC categories.
- Many **commissions and committees** constituted since Independence have referred to the problems of these communities.
  - These include the **Criminal Tribes Inquiry Committee, 1947** constituted in the United Provinces (now Uttar Pradesh),

- **Ananthasayanam Ayyangar Committee in 1949** (it was based on the report of this committee the **Criminal Tribes Act was repealed**),
- **Kaka Kalelkar Commission** (also called **first OBC Commission**) constituted in 1953.
- The **B P Mandal Commission** constituted in 1980 also made some recommendations on the issue.
- The **National Commission to Review the Working of the Constitution** (NCRWC), **2002** held that DNTs have been **wrongly stigmatised as crime prone and subjected to high handed treatment** as well as exploitation by the representatives of law and order and general society.
  - The NCRWC was established under the chairmanship of **Justice M N Venkatachaliah**.
- It has been estimated that **South Asia has the world's largest nomadic population**.
  - In India, roughly 10% of the population is Denotified and Nomadic.
  - While the number of Denotified Tribes is about 150, the population of Nomadic Tribes consists of about 500 different communities.

#### **WHAT ARE THE DEVELOPMENTAL EFFORTS REGARDING DNT?**

- **Background:** A **National Commission for De-notified, Nomadic and Semi-Nomadic Tribes (NCDNT)** was constituted in 2006 by the then government.
  - It was headed by **Balkrishna Sidram Renke** and submitted its report in 2008.
  - The commission held that "It is an irony that these tribes **somehow escaped the attention of our Constitution makers**."
  - They are deprived of Constitutional support **unlike Scheduled Castes and Scheduled Tribes**".
  - The Renke commission estimated their population at **around 10.74 crores based on Census 2001**.
- **Schemes for DNT:** The Ministry of Social Justice and Empowerment is implementing the **following schemes for the welfare of the DNTs**.
  - **Dr. Ambedkar Pre-Matric and Post-Matric Scholarship for DNTs**.
    - This Centrally Sponsored Scheme was launched w.e.f. 2014-15 for the welfare of those DNT students who are not covered under SC, ST or OBC.
  - **Nanaji Deshmukh Scheme of Construction of Hostels for DNT Boys and Girls**.
    - This Centrally Sponsored Scheme launched w.e.f. 2014-15 is implemented through State Governments/ UT Administrations/ Central Universities.
  - From the year 2017-18, the scheme "**Assistance to Voluntary Organization working for the Welfare of OBCs** " has been extended for DNTs

#### **WHAT IS THE DEVELOPMENT AND WELFARE BOARD FOR DE-NOTIFIED, NOMADIC AND SEMI-NOMADIC COMMUNITIES (DWBDNC)?**

- A new Commission was constituted in February 2014 to prepare a **state-wise list**, which submitted its report in 2018, identified 1,262 communities as de-notified, nomadic and semi-nomadic.

- The commission recommended the setting up of a permanent commission for these communities.
- The government set up the **Development and Welfare Board for De-notified, Nomadic and Semi-Nomadic Communities (DWBDNC)**.
- DWBDNC was established under the **Societies Registration Act, 1860** under the aegis of the Ministry of Social Justice and Empowerment for the purpose of implementing welfare programmes.
  - The DWBDNC was constituted on **21<sup>st</sup> February 2019, under the chairmanship of Bhiku Ramji Idate.**

**Source: IE**

### **SC AGREED TO COMPREHENSIVELY EXAMINE PROCEDURES IN DEATH PENALTY CASES**

*GS Paper - 2 - Judiciary - Government Policies & Interventions - Issues Arising Out of Design & Implementation of Policies*



#### **WHY IN NEWS?**

Recently, a Bench of **Supreme Court (SC)** has agreed to **comprehensively examine procedures in death penalty cases** to ensure that judges who have to choose between life imprisonment and the death sentence have comprehensive sentencing information.

- Earlier, the SC had **raised concerns in the process of assessments of mitigating information** in death penalty cases.
- The court is undertaking an exercise to reform the procedures by which information necessary in a death penalty case is brought before courts. In doing so, the **Supreme Court is acknowledging concerns with the manner in which death penalty sentencing is being carried out.**

- While the death penalty has been held to be constitutional, **the manner in which it has been administered has triggered accusations of unfairness and arbitrariness.**

### WHAT IS A DEATH PENALTY?

- **Capital punishment**, also called the death penalty, is **the execution of an offender sentenced to death after conviction by a court of law of a criminal offence.**
- It is the highest penalty awardable to an accused. Generally, it is awarded in extremely severe cases of murder, rapes, treason etc.
- The death penalty is seen as the most suitable punishment and effective deterrent for the worst crimes.
- Those who oppose it, however, see it as inhumane. Thus, the morality of the death penalty is debatable and many criminologists and socialists all across the globe, have been long demanding abolition of the death penalty.
- How are judges supposed to choose between life and death sentences?
- In **May 1980**, when the Supreme Court upheld the constitutional validity of the death penalty in **Bachan Singh's case**, **a framework was developed for future judges to follow when they had to choose** between life imprisonment and the death penalty.
- At the heart of that framework was the recognition that the legislature in the Criminal Procedure Code had made it clear that **life imprisonment would be the default punishment and judges would need to give "special reasons" if they wanted to impose the death sentence.**
- Through the 1980 framework — popularly but inaccurately known as the **"rarest of rare" framework** — the Supreme Court said that judges must consider both aggravating and mitigating factors concerning the crime and the accused when deciding if the death penalty is to be imposed.
- The judgment also made it clear that **life imprisonment as a sentence would have to be "unquestionably foreclosed" before judges imposed the death sentence.**
  - There was an indicative list of factors that the judgment identified as being relevant, but it was clear that it was not meant to be an exhaustive list.
- The Supreme Court has **repeatedly lamented the inconsistency in application of the Bachan Singh framework.** Similar concerns have been **expressed by the Law Commission of India (262<sup>nd</sup> Report).**

### WHAT IS MITIGATION IN CAPITAL CASES?

- A criminal trial has two stages — **the guilt stage and the sentencing stage.**
  - Sentencing happens after the accused has been found guilty of the crime; this is the stage where punishment is determined. Therefore, anything presented or said during sentencing cannot be used to reverse or change the finding of guilt.
- It is a **fundamental tenet of criminal law that sentencing must be individualized**, i.e, in the process of determining punishment, the **judge must take into account individual circumstances of the accused.**
- Mitigation, also referred to as "mitigating factors" or "mitigating evidence," is evidence (information) the defense can present in the sentencing phase of a capital trial to provide reasons why the defendant should not receive a death sentence.

- The task of collecting such is not something lawyers are trained to do — that is the reason the American Bar Association's 2003 Guidelines for the Appointment and Performance of Defence Counsel in Death Penalty recognises the role of a mitigation specialist with a clearly defined role that goes beyond what lawyers can do.
- The SC judgments in *Santa Singh* (1976) and *Mohd Mannan* (2019) have recognised the interdisciplinary nature of such an exercise, and that **it requires professionals other than lawyers to collect such information.**

### WHAT IS THE STATUS OF DEATH PENALTY IN THE INDIAN CONTEXT?

- Prior to the **Criminal Procedure (Amendment) Act (Cr PC) of 1955**, the death penalty was the rule and life imprisonment an exception in India.
  - Further, the courts were bound to give an explanation for awarding a lighter penalty than death for capital offences.
- After the **amendment of 1955 courts were at liberty to grant either death or life imprisonment.**
  - As per Section 354 (3) of the Cr PC, 1973 the courts are required to state reasons in writing for awarding the maximum penalty.
  - The situation has been reversed and a life sentence is the rule and death penalty an exception in capital offences.
  - Moreover, despite a global moratorium against the death penalty by the United Nation, India retains the death penalty.
  - India is of view that allowing criminals guilty of having committed intentional, cold-blooded, deliberate and brutal murders to escape with a lesser punishment will deprive the law of its effectiveness and result in travesty of justice.
- In concurrence of this, a **proposal for the scrapping of the death penalty was rejected by the Law Commission in its 35<sup>th</sup> report 1967.**
- In India as per official statistics, 720 executions have taken place in India after it became independent in the year 1947, which is a minuscule fraction of the people who were awarded death penalty by the trial courts.
  - In the majority of the cases, death was commuted to life imprisonment and some were acquitted by the higher courts.

### WAY FORWARD

- There must be a very high degree of fairness in a system that is interested in subjecting individuals to the experience of death row, and ultimately taking lives through the instrumentality of law. With that as the starting point, the criminal justice system needs to do all it can to ensure that systems are created for procedural fairness.
- The **paths of reforming the death penalty on the one hand and abolishing it on the other, go alongside each other for a very long distance.** Every instance of engagement on reforming the death penalty throws light on the inherent unfairness of using the death penalty, especially in a system like ours.
- In India, the current position regarding death sentences is quite a balanced one. But the broad judicial discretion given to the court has resulted in an extremely uneven judgment in similar cases; this does not represent a good picture of the Indian Judiciary.
- The principle laid down in cases like *Bachan Singh* or *Machhi Singh* has to be strictly followed so that the person convicted for an offence of identical nature is awarded a punishment of an identical degree.

## GANODERMA LUCIDUM: MAGICAL MUSHROOM

*GS Paper - 3 - Cropping Patterns - Agricultural Marketing*



### **WHY IN NEWS?**

Recently, worldwide attempts are being made to popularise *Ganoderma lucidum* (Magical Mushroom) for business and livelihood, by cultivating it on wood logs and sawdust.

### **WHAT ARE MAGICAL MUSHROOMS?**

- It is a **medicinal mushroom** in use for centuries to **heal diseases like diabetes, cancer, inflammation, ulcer as well as bacterial and skin infections.**
  - In India, however, the **potential of the fungus is still being explored.**
- It is considered **one of the most important medicinal mushrooms in the world** since its chemical constituents exhibit numerous medicinal properties.
  - They have earned it monikers such as **“mushroom of immortality”, “celestial herb” and “auspicious herb”**. It is globally also known as **“red reishi mushroom”**.
- The history of consumption of this mushroom can be **traced back to 5,000 years ago in China**. It also **finds mention in the historical and medical records** of countries like **Japan, Korea, Malaysia and India**.
- Unlike normal mushrooms, the peculiar character of this one is that it **grows on wood or wood-based substrate only**.
  - It thrives well in warm and **humid climates**, and grows preferably in mixed forests of **subtropical to temperate regions**.
- It **contains more than 400 chemical constituents**, including triterpenes, polysaccharides, nucleotides, alkaloids, steroids, amino acids, fatty acids and phenols.
  - These show medicinal properties such as **immunomodulatory, anti-hepatitis, anti-tumour, antioxidant, antimicrobial, anti-Human Immunodeficiency Virus (HIV), anti-malarial, hypoglycaemic and anti-inflammatory properties.**

- Apart from medicines, *Ganoderma lucidum* is also used as a base material for manufacturing products such as **tea, coffee, energy supplements, health boosters, beverages, baked goods and anti-ageing cosmetics.**

#### WHAT IS THE SCOPE OF CULTIVATING IT IN INDIA?

- Its **mass production is restricted to countries like China, Japan, Korea, Malaysia, Thailand and the United States of America.**
- Awareness regarding Ganoderma is spreading and the **demand of this mushroom has pushed many countries, including India, to produce it on a large scale and manufacture its products.**
- **India**, a country where a majority of population primarily relies on agriculture, **has great potential to cultivate this mushroom.**
  - It can be grown indoors and is thus safe from the impacts of extreme weather conditions, man-wildlife conflicts, harsh topography and poor soil conditions.
- In India, the mushroom is mostly restricted to laboratory research at present. **Some successful attempts for its cultivation, however, have been made by various Indian organisations.**
  - It is **cultivated on wood logs** (locally called billets) in the country.
- It can have **immense potential for livelihood generation**, but there are some challenges as well.
  - The dried fruiting bodies or raw powder of *Ganoderma lucidum* can be sold at **Rs 4,000-5000 per kilogram.**

Source: DTE