

CHANDRAYAAN-3: INDIA'S LUNAR MISSION

GS III: Sci & Tech

Source: [TH](#)

Launch and Objective:

- Indian Space Research Organisation (ISRO) launched Chandrayaan-3, India's third lunar mission, on July 14.
- Objective: Develop and demonstrate new technologies for inter-planetary missions.

Mission Components:

- Chandrayaan-3 comprises an indigenous lander module (LM), propulsion module (PM), and a rover.
- Three Modules: Propulsion, Lander, and Rover.
- Propulsion Module: Carries the lander and rover to the Moon.
- Lander Module: Contains the rover, which will explore the lunar surface.

Payloads:

- **Chandrayaan-3 carries six payloads for various studies:**
 - **RAMBHA:** Measures near-surface plasma density and changes with time.
 - **ILSA:** Measures seismic activity and lunar crust and mantle structure.
 - **LIBS:** Determines elemental composition of lunar soil and rocks.
 - **APXS:** Derives chemical and mineralogical composition of the Moon's surface.
 - **SHAPE:** Studies earth's spectro-polarimetric signatures in the near-infrared range.
 - **Lunar Lander Vikram:** Will take photos of the rover Pragyaan and study seismic activity by dropping instruments.




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Previous Moon Missions:

- Chandrayaan-3 is similar to its predecessor, Chandrayaan-2 (launched in July 2019).
- Chandrayaan-1 was launched in October 2008, and communication was lost in August 2009.

Soft Landing:

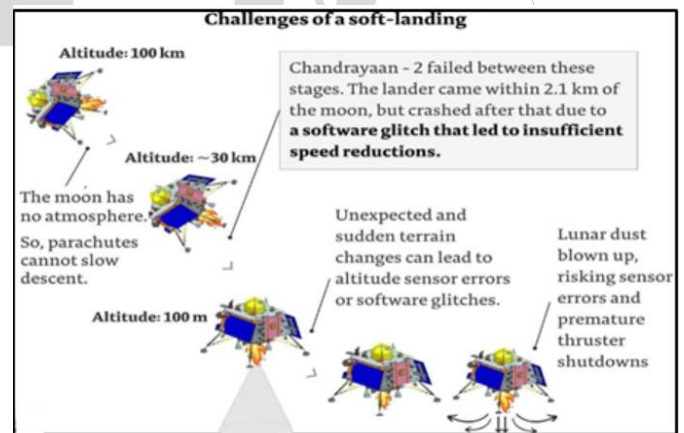
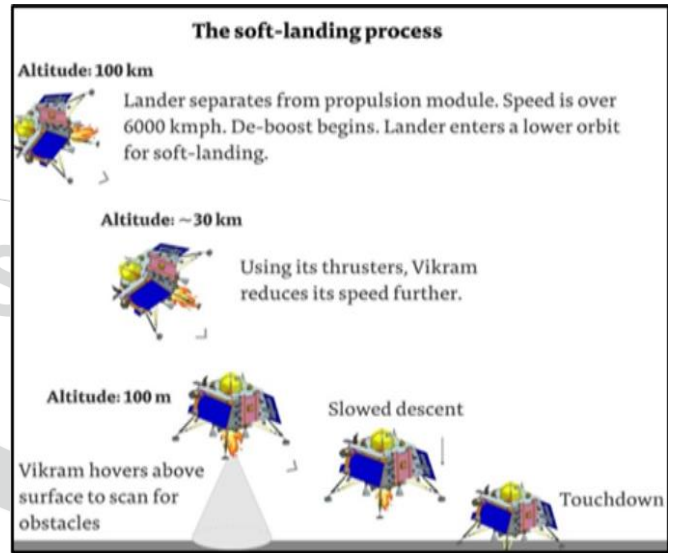
- Soft landing refers to a controlled and gentle touchdown of a spacecraft on the lunar surface.
- Chandrayaan-3's soft landing process involves reducing velocity and aligning with the landing site using retro-rockets or thrusters.

Soft Landing Challenges:

- Chandrayaan-2 faced challenges during the landing phase, losing contact with the lander Vikram.
- Identified issues included guidance software problems and unexpected dispersion in the propulsion system.

Improvements in Chandrayaan-3:

- The rocket will place the payload in an elliptical orbit around Earth, then the propulsion module will pilot the lander to a circular orbit around the Moon.
- Enhancements include strengthening the lander's legs, lowering minimum thrust, increasing power availability, and upgrading the landing sequence.



Types of Moon Missions: Exploring the Lunar Realm

1. **Flybys:** Flyby missions observe the moon from a distance without entering its orbit.
 - Pioneer 3 and 4 (United States) and Luna 3 (USSR) are notable examples of flyby missions.
2. **Orbiters:** Orbiters enter the moon's orbit for prolonged study of its surface and atmosphere.
 - Chandrayaan-1 and 46 other missions have utilized orbiters to explore the moon.
3. **Impact Missions:** Extensions of orbiter missions, impact missions involve instruments landing on the moon's surface for valuable data collection before being destroyed.
 - Chandrayaan-1's Moon Impact Probe (MIP) followed this approach.
4. **Landers:** Landers attempt a soft landing on the moon's surface for up-close observations.
 - The USSR's Luna 9 achieved the first successful moon landing in 1966.
5. **Rovers:** Rovers are specialized payloads that detach from landers to explore the lunar surface independently.
 - Chandrayaan-2's rover, Pragyan, and the upcoming Chandrayaan-3 rover share this

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purpose.

6. **Human Missions:** Human missions involve astronauts landing on the moon's surface.
- NASA achieved this milestone with six successful moon landings between 1969 and 1972.
 - NASA's planned **Artemis III mission in 2025** will mark humanity's return to the moon.



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AVIAN INFLUENZA OUTBREAKS: RISKS AND PRECAUTIONS

GS III: Sci & Tech

SOURCE: [AIR](#)

Avian Influenza Overview:

- Avian influenza, or bird flu, is caused by infection with avian (bird) influenza A viruses.
- Influenza viruses are classified into types A, B, C, and D, with type A viruses infecting humans and various animals.
- Subtypes of Influenza A viruses, such as A(H5N1), A(H7N9), and A(H9N2), are known to cause flu pandemics.

Avian Influenza in Birds and Animals:

- Avian influenza primarily affects birds and can be highly contagious among them.
- Influenza A(H5N1) is particularly deadly for poultry.
- While avian influenza viruses do not usually infect humans, sporadic human infections have been reported.

Risk and Prevention for Humans:

- The main risk factor for humans is exposure to infected live or dead poultry or contaminated environments, like live bird markets.
- Prevention involves controlling the disease in animal sources, avoiding contact with infected birds or their environments, and practicing quality surveillance.

Treatment for Human Infections:

- Antiviral drugs like oseltamivir and zanamivir (neuraminidase inhibitors) can reduce viral replication and improve survival chances.
- Treatment is recommended for a minimum of 5 days, with the possibility of extension based on clinical improvement.

Vaccination and Current Status:

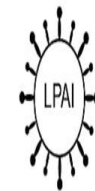
- No commercially available vaccine exists for preventing avian influenza infections in humans.
- Vigilant surveillance, risk-based pandemic planning, and proper investigation of human infections are crucial for managing the disease.

What's in the name?

Avian influenza "subtype"



Low pathogenic



- all HA subtypes (H1-H16)
- common in wild birds
- no disease in wild birds
- occasional, mild disease in poultry



High pathogenic



- "bird flu"
- only H5 and H7 subtypes
- causes outbreaks in poultry
- associated with disease and death in poultry and wild birds
- uncommon in wild birds



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Types of Influenza Virus: A Closer Look

1. **Influenza Virus Types:** There are four main types of influenza viruses: A, B, C, and D.
2. **Epidemic Seasonal Infections:** Influenza A and B are the two types that cause epidemic seasonal infections almost every year.
3. **Influenza C Occurrence:** Influenza C primarily affects humans, but it has also been identified in dogs and pigs.
4. **Influenza D in Cattle:** Influenza D is predominantly found in cattle and, as of now, does not infect or cause illness in humans.
5. **Avian Influenza Type A Viruses:** Type A viruses of influenza are categorized based on two surface proteins – Hemagglutinin (HA) and Neuraminidase (NA).
 - There are approximately 18 HA subtypes and 11 NA subtypes.
 - Various combinations of these proteins result in subtypes like H5N1, H7N2, H9N6, H17N10, H18N11, and others.
6. **Hosts of Influenza A:** All known subtypes of influenza A viruses can infect birds, except for H17N10 and H18N11, which have only been detected in bats.



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DIGITAL PERSONAL DATA PROTECTION BILL, 2022

GS II: Policies & Interventions

Source: [IE](#)

Introduction to Digital Personal Data Protection Bill, 2022:

- The Ministry of Electronics and Information Technology has formulated a draft bill titled "The Digital Personal Data Protection Bill, 2022" to address the processing and protection of digital personal data.
- The bill aims to balance individuals' right to protect their personal data with the need to process data for lawful purposes.

What Does Personal Data Mean?

According to the Personal Data Protection Bill, 'personal data' refers to information, characteristics, traits or attributes that can be used to identify an individual. This includes:



Financial data



Biometric data



Data about caste, religious or political beliefs



Any other category of data specified as personal by the government

Key Features of the Digital Personal Data Protection Bill, 2022:

Applicability	The bill <u>applies to the processing of digital personal data within India and extends to data processed outside India</u> if it involves offering goods or services or profiling individuals in India.
Consent	Personal data can <u>only be processed for lawful purposes</u> with the consent of the individual. Consent must be informed and can be withdrawn at any time. For individuals below 18 years, consent will be provided by their legal guardian.
Rights and Duties of Data Principal	Individuals have the right to obtain information about data processing, seek correction or erasure of personal data, and <u>nominate someone to exercise their rights in case of death or incapacity.</u>
Transfer of Personal Data	The central government will notify countries where data fiduciaries can transfer personal data, subject to prescribed terms and conditions.
Data Protection	The bill establishes the <u>Data Protection Board of India</u> responsible for monitoring

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Board of India	compliance, imposing penalties, handling data breach incidents, and addressing grievances.
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Changes in Age of Consent Provision:

- The upcoming Digital Personal Data Protection Bill, 2022 may lower the age of consent for accessing internet services without parental oversight from 18.
- The bill could exempt certain companies from additional obligations for protecting children's privacy if they can process their data in a "**verifiably safe**" manner.
- This change departs from the earlier draft where the age of consent was hardcoded at 18, requiring parental consent for processing data of individuals below that age.
- The modification reflects the recognition that children can be independent stakeholders on the internet and may desire access to services without parental consent.

Age of Consent for Data Protection in Other Countries:

- The European Union's General Data Protection Regulation (GDPR) sets the age of consent at 16 but allows member states to lower it to as low as 13.
- The United States' Children's Online Privacy Protection Act (COPPA) sets the age of consent at 13, with verifiable parental consent needed for younger individuals.
- In China, entities handling personal data of individuals under 14 years old must obtain parental or guardian consent before processing their data.

Data Protection Laws in Different Nations:

European Union Model	<ul style="list-style-type: none"> • The General Data Protection Regulation (GDPR) is a comprehensive data protection law that governs the processing of personal data in the European Union (EU). • The GDPR emphasizes the right to privacy as a fundamental right, aiming to protect individuals' dignity and their control over the data they generate.
United States Model	<ul style="list-style-type: none"> • Unlike the EU's GDPR, the United States does not have a comprehensive set of privacy rights or principles that specifically address the use, collection, and disclosure of data. • Privacy regulations in the US are predominantly sector-specific, with varying levels of protection. • Government activities related to personal information are governed by broad legislation like the Privacy Act and the Electronic Communications Privacy Act. • In the private sector, sector-specific norms and regulations apply.

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China Model	<ul style="list-style-type: none"> • China has introduced new laws on data privacy and security, including the Personal Information Protection Law (PIPL) and the Data Security Law (DSL). • The PIPL, effective since November 2021, grants Chinese data subjects new rights and aims to prevent the misuse of personal data. • The DSL, in force since September 2021, requires businesses to categorize their data based on importance levels and imposes restrictions on cross-border data transfers.
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Strengthening Data Protection Regime in India

Recognition of Right to Privacy	<ul style="list-style-type: none"> • In the landmark judgment of Justice K. S. Puttaswamy (Retd) vs Union of India in 2017, the Supreme Court unanimously recognized the fundamental right to privacy as an intrinsic part of life and liberty under Article 21 of the Indian Constitution.
B.N. Srikrishna Committee Report 2017	<ul style="list-style-type: none"> • The Indian government appointed a committee of experts chaired by Justice B.N. Srikrishna in August 2017 to formulate a comprehensive data protection framework. • The committee submitted its report in July 2018 along with a draft Data Protection Bill, which included recommendations to enhance privacy laws in India. • The recommendations covered various aspects such as data processing and collection restrictions, establishment of a Data Protection Authority, right to be forgotten, and data localization.
Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021	<ul style="list-style-type: none"> • The government introduced the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules in 2021. • These rules impose stricter obligations on social media platforms and require them to exercise greater diligence in moderating and managing the content on their platforms.

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