



Roadmap of Solar Energy for Universal Energy Access

For Prelims: Clean Energy, Solar Energy, [International Solar Alliance](#), [National Solar Mission](#), [PM-KUSUM](#)

For Mains: Solar Energy and Development in India, Challenges Related to Solar Energy, Government Schemes to Enhance Solar Energy Production in India.

Source: [PIB](#)

Why in News?

Recently, the **Ministry of New and Renewable Energy (MNRE)**, in partnership with the [International Solar Alliance](#), unveiled the report titled 'Roadmap of Solar Energy for Universal Energy Access' developed under [India's G20 presidency in 2023](#). It showcased how [solar energy](#) can play a key role in achieving electricity access and providing socio-economic benefits globally.

- The roadmap is unveiled during the **4th G20 Energy Transition Working Group** held in Goa. It focuses on achieving **Universal Energy Access by 2030** and highlighted the crucial role of **solar mini grids** in driving sustainable energy solutions.

What are the Key Highlights of the Report?

- The roadmap emphasizes solar energy as a **key solution to achieve Universal Energy Access by 2030**.
- It identifies around **59% (396 million people)** of the unelectrified population best suited for electrification through solar-based mini-grids.
- Approximately **30% of the unelectrified population (203 million people)** can be electrified through grid extensions, and the remaining **11% of the unelectrified population (77 million people)** through Decentralized Renewable Energy solutions.
- A total investment of **around USD 192 billion** is required to accomplish the electrification goals, distributed among solar-based mini-grids, solar-based decentralized renewable energy solutions, and grid extensions.
- **Viability gap funding of around 50% (USD 48.5 billion)** is needed to support mini-grid deployment.
- The roadmap underscores the importance of addressing challenges related to **policies, regulations, and financial risks** for successful and sustainable scaling up of solar energy solutions.
- It highlights the need for **technical and financial expertise, skill development, and awareness creation** in energy access-deficit regions to drive electrification initiatives.
- The report advocates for **increased investments, ecosystem development, and optimal resource utilization** to accelerate universal energy access.
- Integration of solar **PV-based cooking solutions with electrification** initiatives is emphasized as a way to enhance energy access in remote and underdeveloped areas.

What is Solar Mini-grids?

▪ **About:**

- Solar mini-grids are **small-scale electricity generation and distribution systems** that use **solar photovoltaic (PV) technology** to generate electricity and store it in batteries.
- They are typically designed to provide electricity to **communities or areas that either need to be connected to the main power grid** or experience frequent power outages.

▪ **Importance:**

- Around **9% of the global population still lacks access to electricity**, with Sub-Saharan Africa and rural areas being the most affected.
 - Solar mini-grids can play a crucial role in addressing this challenge by providing reliable and affordable electricity to these communities.
- Moreover, **over 1.9 billion people worldwide lack access to clean cooking**, and solar mini-grids can also power electric stoves or other cooking appliances, providing clean cooking solutions.

▪ **Benefits of Solar Mini-grids:**

- **Reliability:** Solar energy, with the aid of energy storage systems, offers a reliable source of electricity that remains resilient even **during natural disasters or power outages**.
- **Sustainability:** Solar energy is a clean and renewable energy source, which helps reduce greenhouse gas emissions and mitigate climate change.
- **Scalability:** Solar mini-grids can be scaled up or down depending on the energy demand of the community, making them a flexible option for energy access.
- **Solar Mini-grids Affordability:**
 - Solar energy is a cost-effective alternative to diesel generators in remote regions or islands, where expensive fuel transportation can lead to electricity costs as high as **Rs. 36 per unit**.
 - Harnessing **solar power offers a sustainable and economically viable solution** to reduce electricity expenses in these areas.
 - Deployment of decentralized solar is **supported through Feed-in Tariffs and tariff** restructuring for grid-connected capacity.
 - Expected reduction in battery costs with large-scale procurement further boosts the development of solar mini-grids.

What are the Challenges in the Deployment of Solar Energy for Universal Energy Access?

- Lack of **enabling policies and regulations** that can support the deployment of solar energy for universal energy access.
- Challenges in equipment manufacturing, on-ground execution, and maintenance need to be addressed for sustained affordability.
- Accumulation of dust on solar panels reduces their output by up to 30 percent in a month, necessitating regular cleaning.
 - Current water-based cleaning methods use about 10 billion gallons annually, but waterless methods are labor-intensive and cause scratching.
- **High financial risks in underdeveloped regions** increase project costs for developers, widening the gap between consumer affordability and supplier viability.
- Need for **more technical and financial expertise** to implement and maintain solar mini-grids.

What is the International Solar Alliance (ISA)?

▪ **About:**

- Co-founded by India and France during 2015 during the **UN Climate Change Conference**, the **ISA** is an action-oriented, member-driven, collaborative platform for increased deployment of **solar energy** technologies.
- Its basic motive is to facilitate energy access, ensure energy security, and drive energy transition in its member countries.
- ISA is the nodal agency for implementing **One Sun One World One Grid (OSOWOG)**, which seeks to transfer solar power generated in one region to feed the electricity demands of others.

▪ **Headquarters:**

- The Headquarters is in India with its **Interim Secretariat** being set up in Gurugram.
- **Member Nations:**
 - A total of 109 countries have signed the ISA Framework Agreement and 90 have ratified it.
 - All member states of the [United Nations](#) are eligible to join the ISA.
- **Observer Status to International Solar Alliance:**
 - The [United Nations General Assembly \(UNGA\)](#) has granted Observer Status to the International Solar Alliance (ISA).
 - It will help provide for regular and well-defined cooperation between the Alliance and the United Nations that would benefit global energy growth and development.
- **SDG 7:**
 - Sustainable Development Goal 7 (SDG7) calls for “affordable, reliable, sustainable and modern energy for all” by 2030. It’s three core targets are the foundation for our work: By 2030:

What are the Government Schemes to Enhance Solar Energy Production in India?

- [International Solar Alliance](#)
- [National Solar Mission](#)
- [Kisan Urja Suraksha evam Utthaan Mahabhiyan \(PM-KUSUM\)](#)
- [One Sun, One World, One Grid \(OSOWOG\)](#)
- [Solar Park Scheme](#)
- [Rooftop Solar Scheme](#)

Way Forward

- Assisting access-deficit countries in developing enabling policy and regulatory frameworks.
- Facilitating private-sector participation in energy access projects.
- Integration of solar PV-based cooking solutions with electrification initiatives.
- Incentives and subsidies to attract investments. Exploring innovative financing models like green bonds.
- Hybridization with wind or biomass energy enhances mini-grid reliability and lowers power equipment costs.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Consider the following statements: (2016)

1. The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015.
2. The Alliance includes all the member countries of the United Nations.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (a)

Mains

Q. India has immense potential of solar energy though there are regional variations in its developments. Elaborate. (2020)

Intellectual Property Rights Policy Management Framework

For Prelims: Intellectual Property Rights Policy Management framework, [National IPR \(Intellectual Property Rights\) Policy 2016](#), [Geographical Tag](#), [Copyrights](#), [Universal Declaration of Human Rights](#).

For Mains: Intellectual Property Rights, Need and Challenges.

Source: [PIB](#)

Why in News?

Recently, the Ministry of Commerce and Industry, Government of India, has informed the Rajya Sabha about the **Intellectual Property Rights Policy Management (IPRPM) Framework**.

What is IPRPM Framework?

- **About:**
 - The framework was launched in the form of [National IPR \(Intellectual Property Rights\) Policy 2016](#) encompassing all **IPRs into a single vision document** setting in place an institutional mechanism for implementation, monitoring and review of IP laws.
- **Types of IPR Covered under the Framework:**

Right Area	Legal provision	Subject	Term of Protection
Patent	Patent Act, 1970 & Patent Rules, 2003 amended in 2014, 2016, 2017, 2019, 2020 and 2021.	Must qualify requirements of being novel, Inventive and having industrial utility	20 years
Trademarks	Trademark Act 1999 & Trademark Rules 2017	Protects brand name , logo, design for a business or commercial enterprise	10 years; renewed for 10 years on payment of additional fees
Designs	Designs Act 2000 & Designs (Amendment) Rules 2021	New or original designs (ornamental / visual appearance discernible to the human eye) which can be replicated industrially	10 + 5 years
Copyrights	Copyrights Act 1957 & Copyrights Rules	Creative, artistic, literary , Musical and	Authors -Lifetime+ 60 years; Producers - 60

	2013 amended in 2021.	audio-visual works	years Performers - 50 years;
Geographical Indications	Geographical Indications Act 1999 & GI Rules 2002 amended in 2020.	Goods bearing unique characteristics due to geographical linkage - agricultural goods, natural goods, manufactured goods, handicrafts and foodstuff	10 years, Renewed for 10 years on payment of additional fees
Semiconductor Integrated Circuits Layout Design	Semiconductor or Integrated Circuits Layout Design Act 2000 & Rules 2001	A layout of transistors and other circuitry elements including lead wires connecting such elements and expressed in any manner in semiconductor integrated circuits.	10 Years.
Trade Secret	Common Law approach covered through IPC, Contract Act, IP Act and Copyright	Confidential information having commercial value	Till the time confidentiality is safeguarded.
Plant Varieties	Protection of Plant Varieties and Farmers Rights Act (PPVFRA), 2001	Traditional varieties and landraces, all developed varieties (non-traditional and non-landrace) in trade/use for older than 1 year and not older than 15 years or 18 years (in case of trees and vines), and new plant varieties.	6-10 years.

▪ **Objective:**

- **IPR Awareness:** Outreach and promotion are important to create public awareness about the economic, social and cultural benefits of IPRs among all sections of society.
- **Generation of IPRs:** To stimulate the generation of IPRs.
- **Legal and Legislative Framework:** To have strong and effective IPR laws, which balance the interests of rights owners with larger public interest.
- **Administration and Management:** To modernize and strengthen service oriented IPR administration.
- **Commercialisation of IPRs:** Get value for IPRs through commercialisation.
- **Enforcement and Adjudication:** To strengthen the enforcement and adjudicatory mechanisms for combating IPR infringements.
- **Human Capital Development:** To strengthen and expand human resources, institutions and capacities for teaching, training, research and skill building in IPRs.

▪ **Initiatives under IPR Policy:**

- **National Intellectual Property Awareness Mission (NIPAM):** It is a flagship program to impart IP awareness and basic training in educational institutes
- **National Intellectual Property (IP) Awards:** These are conferred every year to recognize and **reward the top achievers comprising individuals**, institutions, organizations and enterprises, for their IP creations and commercialization.
- **Scheme for Facilitating Start-Ups Intellectual Property Protection (SIPP):** It

- encourages **filling of Patent applications** by Startups.
- **Patent Facilitation Programme:** It aims to scout patentable inventions and provide full financial, technical and **legal support in filing and obtaining patents.**

What are Intellectual Property Rights?

▪ About:

- IPR are the rights given to **persons over the creation of their minds**. They usually give the creator an exclusive right over the **use of his/her creation for a certain period of time**.
- These rights are outlined in **Article 27 of the [Universal Declaration of Human Rights](#)**, which provides for the right to benefit from the protection of moral and material interests resulting from authorship of scientific, literary or artistic productions.
- The importance of intellectual property was first recognized in the **[Paris Convention for the Protection of Industrial Property \(1883\)](#)** and the **Berne Convention for the Protection of Literary and Artistic Works (1886)**.
- Both treaties are administered by the **[World Intellectual Property Organization \(WIPO\)](#)**.

▪ Need for IPR:

- **Encourages Innovation:**
 - The legal protection of **new creations encourages** the commitment of additional resources for further innovation.
- **Economic Growth:**
 - The promotion and protection of intellectual property **spurs [economic growth](#)**, creates new jobs and industries and enhances the quality and enjoyment of life.
- **Safeguard the Rights of Creators:**
 - IPR is required to **safeguard creators and other producers** of their intellectual commodity, goods and services by granting them certain time-limited rights to control the use made of the manufactured goods.
- **Ease of Doing Business:**
 - It promotes innovation and creativity and ensures ease of doing business.
- **Transfer of Technology:**
 - It facilitates the transfer of technology in the form of foreign direct investment, joint ventures and licensing.

What are the Issues Related to IPR Regime?

- **Patent-Friendliness Over Public Health:** The National IPR Policy recognizes the contribution of the Indian pharmaceutical sector in providing affordable medicines globally. However, **India's patent establishment has prioritized patent-friendliness** over public health and national interest in the pharmaceutical sector.
- **Data Exclusivity:** Foreign investors and **[Multi-National Corporations \(MNCs\)](#)** allege that Indian law does not protect against unfair commercial use of test data or other data submitted to the government during the application for market approval of pharmaceutical or agro-chemical products. For this, they demand a data exclusivity law.
- **Resulting in Anti-Competitive Market:** The Patents Act has **four stakeholders:** society, government, patentees, and their competitors, and interpreting and enforcing the act to only benefit patentees undermines the rights of other stakeholders and leads to anti-competitive market outcomes.

What are the Treaties and Conventions related to IPR?

▪ Global:

- India is a member of the **[WTO \(World Trade Organization\)](#)** and committed to the **Agreement on TRIPS (Trade Related Aspects of Intellectual Property Rights) Agreement**.
- India is also a member of **[WIPO \(World Intellectual Property Organisation\)](#)**, a body responsible for the promotion of the protection of intellectual property rights throughout the world.

- India is also a member of the following important **WIPO-administered International Treaties** and Conventions relating to IPRs:
 - Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (adopted in 1977)
 - Paris Convention for the Protection of Industrial Property (adopted in 1883).
 - Convention Establishing the World Intellectual Property Organization (adopted in 1967).
 - Berne Convention for the Protection of Literary and Artistic Works (Adopted in 1886).
 - [Patent Cooperation Treaty](#) (Adopted in 1970).
- **National:**
 - [Indian Patent Act 1970:](#)
 - This principal law for patenting system in India came into force in the year 1972. It replaced the Indian Patents and Designs Act 1911.
 - The Act was amended by the **Patents (Amendment) Act, 2005**, wherein product patent was extended to all fields of technology including food, drugs, chemicals and microorganisms.

Way Forward

- India, as a developing country, has often faced challenges in **striking a balance between providing access to essential goods** like medicines and incentivizing innovation through patents.
- India can involve adopting measures that **encourage innovation while ensuring access to affordable healthcare** and other essential goods.
- As technology and business models continue to evolve, **it is essential to regularly review and update the IPR laws** to remain relevant and effective.
- Flexibility in the IPR regime is necessary to address emerging challenges such as those posed by digital technologies.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q1. With reference to the 'National Intellectual Property Rights Policy', consider the following statements: (2017)

1. It reiterates India's commitment to the Doha Development Agenda and the TRIPS Agreement.
2. Department of Industrial Policy and Promotion is the nodal agency for regulating intellectual property rights in India.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (c)

Q2. Consider the following statements: (2019)

1. According to the Indian Patents Act, a biological process to create a seed can be patented in India.
2. In India, there is no Intellectual Property Appellate Board.
3. Plant varieties are not eligible to be patented in India.

Which of the statements given above is/are correct?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

Ans: (c)

Mains

Q. In a globalized world, Intellectual Property Rights assume significance and are a source of litigation. Broadly distinguish between the terms—Copyrights, Patents and Trade Secrets. **(2014)**

Global Efforts Towards Immunization

For Prelims: [World Health Organization](#), [United Nations Children's Fund](#), [DTP Vaccine](#), [Covid-19 pandemic](#), [Human papillomavirus \(HPV\)](#), [Immunization Agenda 2030](#), [World Immunization Week](#), [Universal immunisation programme](#), [Mission Indradhanush](#).

For Mains: Status of Immunisation in India.

Source: [DTE](#)

Why in News?

In a joint press release, the [World Health Organization \(WHO\)](#) and [United Nations Children's Fund \(UNICEF\)](#) announced that significant progress had been made in global immunization efforts during 2022.

- Over **4 million more children** were vaccinated in 2022 compared to the year before, reflecting the collective efforts of countries and international organizations to combat vaccine-preventable diseases.

What is the Major Progress in Global Immunization Efforts?

- **Positive Trends in Immunization Coverage:**
 - **DTP3 Vaccine Usage as a Global Marker:**
 - The [DTP3 vaccine](#), protecting against **diphtheria, tetanus, and pertussis (whooping cough)**, serves as the standard indicator for immunization coverage worldwide.
 - In WHO South-East Asia Region, the **number of zero-dose children** (those that have not received even the first dose of DPT vaccine) **halved to 2.3 million in 2022 from 4.6 million in 2021**.
 - The coverage rate for DTP3 in India rose to an **all-time of 93% in 2022**, surpassing the previous pre-pandemic best of **91%** recorded in 2019.
 - **Recovery from Pandemic-related Disruptions:**
 - Of the **73** countries that experienced significant declines in immunization coverage during the pandemic, **15** have recovered to pre-pandemic levels and 24 are on the road to recovery.

- **HPV Vaccination Rates:**
 - [Human papillomavirus \(HPV\) vaccination](#) rates have returned to pre-pandemic levels, but they remain below the **90% target**.
- **Lingering Disparities and Ongoing Challenges:**
 - **Uneven Recovery and System Strengthening:**
 - While certain countries achieved remarkable recoveries, many smaller and poorer nations still face challenges in restoring immunization services.
 - **34 countries are stagnating or experiencing further declines in vaccination rates**, underscoring the need for ongoing catch-up and system strengthening efforts.
- **Measles Vaccination: A Cause for Concern:**
 - [Measles](#) (viral disease that typically affects children) vaccination rates have not rebounded as effectively as other vaccines.
 - This has increased the risk of measles infections for an additional **35.2 million children globally**.
 - First dose measles vaccination coverage improved to **83% in 2022**, but it remains lower than the 86% achieved in 2019.

What are the Major Global Initiatives Related to Immunization?

- [Immunization Agenda 2030 \(IA2030\)](#): It sets an ambitious, overarching global vision and strategy for vaccines and immunization for the decade 2021–2030.
 - **By the end of the decade, IA2030 aims to:**
 - Reduce by 50% the number of children receiving zero vaccine doses
 - Achieve 500 introductions of new or under-utilized vaccines in low- and middle-income countries
 - Achieve 90% coverage for essential childhood vaccines
- [World Immunization Week](#): It is celebrated every year in the last week of April.
 - **Theme 2023 - 'The Big Catch-up'**

What is the Status of Immunization in India?

- **About:**
 - Annually, India vaccinates more than 30 million pregnant women and 27 million children through its [Universal immunization programme](#).
 - A child is considered fully immunized if they receive all the required vaccines as per the **national immunization schedule within their first year of life**.
 - However, according to **UNICEF**, only **65% of children in India** receive full immunization during the first year of their life.
- **Major Immunization Programmes in India:**
 - **Universal Immunization Programme (UIP):**
 - The program provides **free immunization against 12 vaccine-preventable diseases**.
 - **Nationally Against 9 Diseases:** Diphtheria, Pertussis, Tetanus, Polio, Measles, Rubella, severe form of Childhood Tuberculosis, Hepatitis B and Meningitis & Pneumonia caused by Hemophilus Influenza type B
 - **Sub-nationally Against 3 Diseases:** Rotavirus diarrhea, Pneumococcal Pneumonia and Japanese Encephalitis
 - Two major milestones of the UIP have been the [eradication of polio in 2014](#) and the **elimination of maternal and neonatal tetanus in 2015**.
 - **Mission Indradhanush:**
 - [Mission Indradhanush \(MI\)](#) was launched by the **Ministry of Health and Family Welfare (MOHFW) in 2014** with the aim to vaccinate all unvaccinated and partially vaccinated children under UIP.
 - It is being implemented in several phases.
 - **Other Supporting Measures:**

- Electronic Vaccine Intelligence Network (eVIN) rollout.
- National Cold Chain Management Information System (NCCMIS).

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. 'Mission Indradhanush' launched by the Government of India pertains to (2016)

- (a) immunization of children and pregnant women
- (b) construction of smart cities across the country
- (c) India's own search for the Earth-like planets in outer space
- (d) New Educational Policy

Ans: (a)

International Symposium on Sustainable Livestock Transformation

For Prelims: [G20](#), [Article 48](#), [Article 51A\(g\)](#), [Lumpy skin disease](#), [Heat stress](#), [National Animal Disease Control Program](#), [National Livestock Mission](#), [Prevention of Cruelty to Animals Act, 1960](#).

For Mains: Challenges Related to Livestock Sector in India

Source: [PIB](#)

Why in News?

Under the **Agriculture Working Group (AWG)** of [G20](#), the **International Symposium on Sustainable Livestock Transformation** was inaugurated at [National Dairy Development Board, Anand](#).

What is the Status of Livestock Sector in India?

- **About:**
 - **Livestock** provides livelihood to **two-third of rural community**. Also, the sector contributes to around **4%** of country's GDP.
 - **Dairy** is the **single-largest agri commodity** in India. India is ranked 1st in milk production contributing 23% of global milk production.
 - There are about **303.76 million bovines** (cattle, buffalo, mithun and yak), 74.26 million sheep, 148.88 million goats, 9.06 million pigs and about **851.81 million poultry** as per **20th Livestock Census** in the country.
 - According to Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) production data (2020), **India ranks 3rd in Egg Production and 8th in meat production in the world**.
- **Related Constitutional Provisions:**
 - **Directive Principle of State Policy:**
 - **Article 48:** The State shall work towards organizing **agriculture and animal husbandry** on modern and scientific lines.
 - It shall take steps to **preserve and improve the breeds of cows, calves, and other milch and draught cattle and prohibit their slaughter**.
 - **Fundamental Duty:**

- **Article 51A(g):** It is the duty of every citizen to protect and improve the natural environment, including forests, lakes, rivers, and wildlife, and to **show compassion for all living creatures.**

▪ **Challenges Related to Livestock Sector in India:**

- **Resource Scarcity and Feed Shortages:** The demand for [animal feed](#), including **grains and fodder**, surpasses supply, resulting in higher costs for farmers and compromised animal nutrition.
 - This scarcity affects **livestock health, productivity, and overall welfare**, necessitating innovative solutions for sustainable feed production and distribution.
 - According to the [Indian Grassland and Fodder Research Institute \(IGFRI\)](#), India faces a **green fodder shortage of 63.5%**, and the shortage of dry fodder is 23.5%.
- **Inadequate Healthcare Infrastructure:** Limited access to veterinary services and vaccines poses a threat to disease control, leading to frequent outbreaks that impact livestock productivity and quality of produce e.g., [lumpy skin disease](#).
- **Climate Change and Environmental Pressures:** [Erratic weather patterns](#), water scarcity, and rising temperatures impact both feed and water availability, making **livestock vulnerable to [heat stress and related diseases](#)**.
 - A study by the **National Dairy Research Institute (NDRI)** found that heat stress reduced milk yield by **0.45 kg per cow per day** during summer months in India.
- **Quality Breeding and Genetic Improvement:** Livestock breeding in India often faces limitations in terms of **access to quality breeding stock and genetic improvement programs**.
 - According to the **Department of Animal Husbandry & Dairying (DAHD)**, only **30% of the breedable female bovines are covered under artificial insemination** services in India.
- **Animal Welfare and Ethical Concerns:** Ethical issues related to livestock farming, such as [animal cruelty](#) and **inhumane practices**, have gained increasing attention in recent years.

▪ **Government Initiatives Related to Livestock Sector:**

- [National Animal Disease Control Program \(NADCP\)](#)
- Animal Husbandry Infrastructure Development Fund (AHIDF)
- [National Livestock Mission](#)
- [Prevention of Cruelty to Animals Act, 1960](#)
 - **Animal Welfare Board of India (AWBI)** was established in 1962 under Section 4 of the Act.

Way Forward

- **Nutritional Innovation for Livestock Feed:** Encouraging research and development in alternative and sustainable feed sources.
 - There is a need to invest in technologies for **insect-based protein, algae-based supplements, and byproduct utilization** to reduce dependency on traditional feed crops.
- **Livestock Waste-to-Energy Projects:** Promote the establishment of bioenergy plants that utilize **livestock waste for [biogas production](#)**.
 - This not only addresses waste management but also generates renewable energy for rural communities.
 - The byproducts of biogas production can be used as organic fertilizers, closing the loop on resource utilization and enhancing sustainability.
 - Also, promoting circular economies by converting [agricultural waste](#) into **nutritious animal feed** which can be both eco-friendly and cost-effective.
- **Genetic Surveillance:** [Genetic Surveillance](#) especially of viruses needs to be strengthened for livestock in India.
 - As the **lumpy skin disease** outbreak continues to spread rapidly with high mortality, there is a need to scrutinise its **genetic structure and analyse its behaviour to tackle this issue effectively.**
- **Towards One-Health Approach:** Recognizing the [One Health Approach](#) is crucial, understanding the interconnectedness of people, animals, plants, and the environment.

- Encouraging interdisciplinary collaborations in research and knowledge sharing can promote health sustainability and effectively address [zoonotic diseases](#).

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q.1 Which of the following is the chief characteristic of 'mixed farming'? (2012)

- (a) Cultivation of both cash crops and food crops
- (b) Cultivation of two or more crops in the same field
- (c) Rearing of animals and cultivation of crops together
- (d) None of the above

Ans: (c)

Mains

Q. Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable measures to promote this sector in India. **(2015)**

World Drowning Prevention Day

For Prelims: World Drowning Prevention Day

For Mains: Drowning vulnerability of children to drowning in India, Effective interventions to prevent drowning

Source: [TH](#)

Why in News?

Recently, the **alarming number of drowning incidents in India**, with a significant proportion involving children, has brought attention to the urgent need for preventive measures.

- As World Drowning Prevention Day, is approaching **it is essential to address this preventable cause of death and raise awareness** about safety measures that can help curb these tragedies.

What is World Drowning Prevention Day?

- World Drowning Prevention Day is a global event that is held **annually on 25 July** to remember **lives lost due to drowning** and to **increase knowledge on safety in and around water**.
- World Drowning Prevention Day was **declared in April 2021** by the [United Nations General Assembly resolution](#), which invited the [World Health Organization \(WHO\)](#) to coordinate

actions within the **UN system on drowning prevention.**

- This day is important because drowning is a major public health problem that **has caused over 2.5 million deaths in the last decade, mostly in low- and middle-income countries.**
- The human, social and economic toll of drowning is intolerably high and entirely preventable.
 - The implementation of evidence-based, low-cost drowning prevention interventions can drastically reduce the risk of drowning.

What are the Statistics of Incidents associated with Drowning?

- The latest **WHO Global Health Estimates** indicate that **almost 236 000 people lost their lives to drowning in 2019.**
 - Just over **50% of these deaths occur among those aged under 30 years**, and drowning is the **sixth leading cause of death worldwide for children aged 5-14 years.**
 - Highest drowning rates occur **among children aged 1-4 years**, followed by children **aged 5-9 years globally.**
- Drowning is the **3rd leading cause of unintentional injury death worldwide**, accounting for **7% of all injury-related deaths.**
- **Boys are at higher risk of drowning than girls.**
- **Rural areas have higher drowning rates** than urban areas.
- Limited access to **safe water increases vulnerability to drowning.**
- According to the [National Crime Records Bureau](#), **there were 36,362 drowning deaths reported in 2021 in India**, with children being particularly vulnerable.

What are the Causes and Risk Factors of Drowning?

- Drowning is defined as the process of **experiencing respiratory impairment from submersion or immersion in liquid.**
- Drowning can result from various causes, **such as floods, storms, boat accidents, lack of supervision, unsafe water sources, or recreational activities.**
- The main risk factors for drowning include **age, gender, location, access to water, swimming ability, alcohol use, and lack of awareness.**
- **Lack of swimming skills and water safety knowledge** contributes to drowning risk.
- Alcohol use impairs judgment and **increases the likelihood of drowning.**
- Lack of awareness about drowning prevention measures reduces protective actions.

What are Some of the Effective Interventions to Prevent Drowning?

- Install **barriers around water bodies (pools, wells, ponds)** to control access.
- Provide **safe areas away from water for children and adults.**
- **Teach swimming and water safety skills**, especially those **who live near water or engage in water-related activities.**
- Training bystanders in safe rescue and resuscitation techniques, such as **Cardiopulmonary resuscitation (CPR) or mouth-to-mouth breathing.**
- Enforce **safe boating and shipping regulations**, including wearing life jackets and proper maintenance.
- Improve **flood risk management with flood-resistant infrastructure** and early warning systems.

What Are Government Initiatives to Tackle Drowning Deaths?

- **India:**
 - The Indian government **established an expert committee to draft the Drowning Prevention Framework of India.**
 - The **Ministry of Health and Family Welfare** introduced a '**National Emergency Life Support**' provider course manual, covering drowning prevention in February 2022.
- **Global:**
 - **Global Alliance for Drowning Prevention** was established during the [76th World](#)

[Health Assembly meeting.](#)

- Aims to **address global public health concerns related to drowning** by 2029.
 - World Health Organization to coordinate **action and prepare a global status report on drowning.**
-

World Fragile X Day

[Source: IE](#)

Why in News?

The World Fragile X Awareness Day is marked on 22nd July every year, started in 2021 to raise awareness about the rare genetic illness, **Fragile X or Martin-Bell syndrome.**

What is Fragile X or Martin-Bell Syndrome?

▪ About:

- Fragile X syndrome (FXS) is an **inherited genetic disease passed down from parents to children** that causes intellectual and developmental disabilities.
- FXS is the most common **hereditary cause of mental disability** in boys. It affects 1 in 4,000 boys.
 - It's less common in girls, affecting about 1 in every 8,000. Boys usually have more severe symptoms than girls.
- People with FXS usually experience a range of developmental and learning problems.
- The disease is a **chronic or lifelong condition**. Only some people with FXS are able to **live independently.**

▪ Causes:

- FXS is caused by a defect in the FMR1 gene located on the **X chromosome.**
- The FMR1 (Fragile X Mental Retardation 1 gene) gene is located on the X chromosome in humans. It is responsible for **producing a protein called FMRP (Fragile X Mental Retardation Protein)**, which plays a crucial role in normal brain development and function.

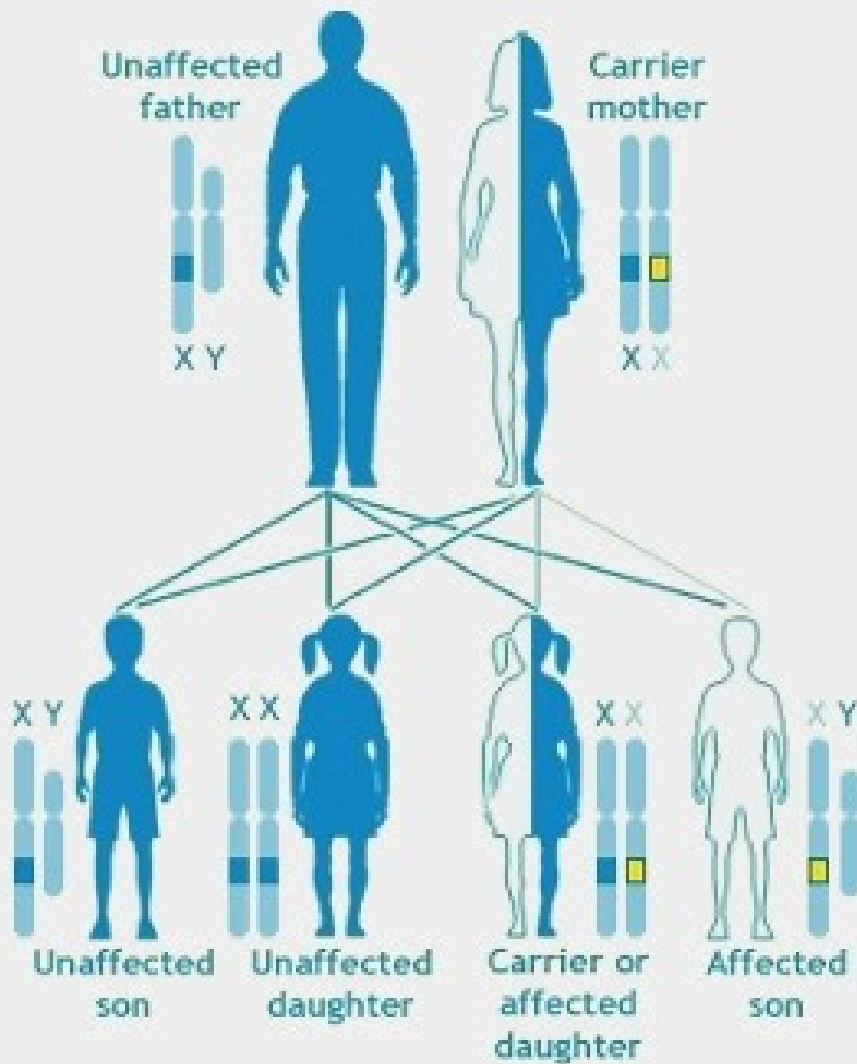
▪ Risks:

- Women who are carriers are at an increased risk for premature menopause, or menopause that starts before the age of 40.
- Men who are carriers are at increased risk for a condition known as [Fragile X Tremor Ataxia Syndrome \(FXTAS\)](#).
 - The disorder results in **progressive cerebellar ataxia**, action tremor, Parkinsonism and cognitive decline.
- It also can lead to **difficulty with balance and walking**. Male carriers may also be at an **increased risk for [Dementia](#).**

▪ Linked with Inheritance:

- Women who carry **Fragile X have a 50% chance** of passing the mutated gene to **each of her children**. If she passes the affected gene, her children **will either be carriers, or they will have Fragile X syndrome.**
- Men who carry Fragile X will pass the **premutation to all their daughters** but none of their sons. These daughters are **carriers, but they do not have Fragile X syndrome.**

X-Linked Inheritance in Fragile X Syndrome



adapted from US National Library of Medicine

Saltpan Workers of Little Rann of Kutch

[Source: DTE](#)

Why In News?

On July 18, 2023, **saltpan workers (commonly known as agariyas)** presented a representation to Gujarat Chief Minister and urged the state to intervene in response to instructions from forest department that restricted their entry into the Little Rann of Kutch.

What is the Order of the Forest Department?

- **Little Rann of Kutch declared a wild ass sanctuary in 1972.**
 - Settlement survey conducted in 1997, permitting salt cultivation and leasing land to saltpan workers. Traditional agariyas were excluded from the benefits of the settlement survey.
- **Legal Implications:**
 - Ongoing scrutiny of the 1997 settlement survey is being done by Gujarat High Court and National Green Tribunal involved in the resolution of land-poaching activities.

What are the Arguments Raised by Agariyas in Their Defence?

- **Wild Ass Population Growth vs. Man-Animal Conflict:** Census data shows a significant rise in the wild ass population in the area from 700 in 1973 to 6,082 in 2019.
 - Census data ruled out the possibility of man-animal conflict in the Wild Ass Sanctuary due to work of Saltpan workers.
- **Saltpan Workers' Land Use:** Saltpan workers use only 6% of the total land area for salt cultivation in Little Rann of Kutch, which is negligible in both quantity and space.
- **Concerns against improper Survey:** In meetings held at 16 out of 100-125 villages, forest department officials removed the names of 95% of the 8000 families of agariyas (saltpan workers).
 - Most of the agariyas listed in the settlement survey report are not alive.

Who are the Saltpan workers?

- **Koli, Sandhi, and Miyana communities** residing in 100-125 villages around the Little Rann of Kutch in North Gujarat, Kutch, and Saurashtra regions are dependent on salt cultivation in the area called **Saltpan workers**.
 - They are engaged in the profession for 600-700 years, dating back to the British rule.



About Wild Ass Sanctuary:

- **Location:** It is in the **Little Rann of Kutch** of the **Gujarat** State in India.
- It is the **only place where the Indian wild ass**, locally called Khacchar, **is found**.
- The sanctuary is home to a sizeable population of **Rabari and Bhar wad tribes**.

Key Facts about Indian Wild Ass:

- It is a **sub-species of Asian Wild Ass**, i.e., *Equus hemionus*.



- It is characterized by **distinctive white markings** on the anterior part of the rump and on the posterior part of the shoulder and a **stripe down the back that is bordered by white.**
- **Distribution: World's last population** of Indian Wild Ass is restricted to **Rann of Kachchh, Gujarat.**
- **Habitat: Desert and grassland ecosystems.**
- **Conservation Status:**
 - **IUCN: Near threatened.**
 - **CITES: Appendix II**
 - **Wildlife Protection Act (1972): Schedule-I**

UPSC Civil Services Exam, Previous Year Questions (PYQ)

Q. Among the following, who is the Agaria Community? (2009)

- (a)** A traditional toddy tappers community of Andhra Pradesh
- (b)** A traditional fishing community of Maharashtra
- (c)** A traditional silk-weaving community of Karnataka
- (d)** A traditional salt pan workers community of Gujarat

Answer: (d)

Rapid Fire Current Affairs

Bal Gangadhar Tilak Birth Anniversary



Recently, the Prime Minister of India has paid tributes to [Bal Gangadhar Tilak](#) on his Jayanti on 23rd July, 2023.

- Bal Gangadhar Tilak, born on 23rd July 1856, was a **freedom fighter, lawyer, and educationist known as Lokmanya Tilak.**
- Founder of the **Deccan Education Society** in 1884, he also established the **Fergusson College in 1885.**
- Tilak emphasized the need for **self-rule or swarajya** and popularized the slogan "**Swaraj is my birthright and I shall have it!**"
- Tilak joined the [Indian National Congress](#) in 1890 and played a significant role in the **Surat Split in 1907**, advocating complete independence or swarajya.
- He propagated the [Swadeshi and Boycott Movement](#) to promote Indian self-reliance.
- Tilak founded the **All-India Home Rule League** in April 1916, aiming for Hindu-Muslim unity through the Lucknow Pact in 1916.
- Known for his newspapers **Kesari (Marathi) and Mahratta (English)** and authored books like **Gita Rhasya and Arctic Home of the Vedas.**
- Bal Gangadhar Tilak passed away on **1st August 1920**, leaving behind a significant contribution to India's freedom movement.

Read more: [Bal Gangadhar Tilak](#)

Pratihara Ruler Mihir Bhoja



A controversy surrounding the unveiling of a statue of **Samrat Mihir Bhoj**, a 9th-century ruler, in Kaithal district, Haryana, has led to a significant boycott by the Rajput community.

- Mihir Bhoja or Bhoja I (836 - 885 CE) is the greatest ruler of the [Pratihara Dynasty.](#)
- Mihir Bhoj had made **Kannauj his capital.** He was a devotee of Vishnu, so in honor of Vishnu, he had assumed titles like Varaha and Prabhas.
- The achievements of Mihir Bhoj have been described in his Gwalior Prashasti inscription.

Read more: [Pratihara Ruler Mihira Bhoj](#)

The Cannabis Medicine Project

- Government of India recently announced the **Cannabis Medicine Project**. This research project, undertaken by **CSIR-IIIM Jammu**, is the first of its kind in India, and it represents a collaboration between the **Indian government and a Canadian firm**.
 - It aims to explore the medicinal potential of **cannabis**, benefiting patients with **neuropathies, cancer, and epilepsy**.
- Besides the therapeutic implications, the project will also **boost investment in Jammu and Kashmir**, creating a positive impact on the region's economy.

Read More: [Neuropathies](#), [Cancer](#), [Epilepsy](#)

Chandra Shekhar Azad



- On **July 23rd**, we commemorate the birth anniversary of **Chandra Shekhar Azad**, an iconic and fearless freedom fighter of India.
- Born in **Bhabhra village (now in Alirajpur District of Madhya Pradesh)** in 1906, Azad joined **Mahatma Gandhi's non-cooperation movement** at a young age of 15 and adopted the name "**Azad**" as a symbol of his defiance against British rule.
- He became a prominent member of the **Hindustan Socialist Republican Association (HSRA)**, a revolutionary group dedicated to armed struggle against the colonial government.
 - Azad was also involved in daring acts of resistance, including the **Kakori train robbery**.
- Known for his organizational skills and mastery of **disguise**, he pledged to never be captured alive. Tragically, he lost his life on **February 27, 1931**, in a fierce gunfight with the police.

Read More: [Chandra Shekhar Azad](#), [Hindustan Socialist Republican Association](#), [Non-cooperation movement](#)