



Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Amendment Bill, 2022

For Prelims: United Nations Security Council, Financial Action Task Force, Nuclear Non-proliferation Treaty of 1968, Biological Weapons Convention of 1972, Chemical Weapons Convention of 1993

For Mains: Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Amendment Bill, 2022.

Why in News?

Recently, the Government of India introduced in the Lok Sabha the **Weapons of Mass Destruction (WMD) and their Delivery Systems (Prohibition of Unlawful Activities) Amendment Bill, 2022**.

- The bill envisages to **prohibit financing of any activity in relation to WMD** and to **empower to act against financiers of such activities**.

What are the highlights of the Bill?

- **Background:** The bill seeks to modify the **Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005**.
- **Original Legislation:** The 2005 Act was enacted to prohibit unlawful activities in relation to weapons of mass destruction and their delivery systems.
 - This Act **covers unlawful activities relating to biological, chemical and nuclear weapons and their delivery systems**.
 - It also provides for **integrated legal measures** to exercise controls over the export of materials, equipment and technologies in relation to weapons of mass destruction and their delivery systems and for prevention of their transfers to non-State actors or terrorists.
- **Need of Amendment:** The **existing Act** pertaining to weapons of mass destruction **does not cover the financial aspect of such delivery systems** and the **new provisions are essential to meet international obligations**.
 - The [United Nations Security Council](#)'s targeted financial sanctions and the recommendations of the [Financial Action Task Force](#) have mandated against financing of proliferation of weapons of mass destruction and their delivery systems.
- **Objectives of the Bill:** The Bill aims to achieve three objectives:
 - **Prohibit financing** of activities linked to WMD.
 - Empower the **Centre to freeze, seize or attach funds**, financial assets or economic resources for preventing such financing.
 - **Prohibit making available funds**, financial assets or economic resources for any prohibited activity in relation to weapons of mass destruction and their delivery systems.

What are Weapons of Mass Destruction (WMD)?

- These are weapons with the **capacity to inflict death and destruction** on such a massive scale and so indiscriminately that its very presence in the hands of a hostile power can be considered a grievous threat.

- Modern weapons of mass destruction are either **nuclear, biological, or chemical weapons**—frequently referred to collectively as **NBC weapons**.
- The term weapons of mass destruction has been in currency **since at least 1937**, when it was used to describe **massed formations of bomber aircraft**.
 - For example, **Nuclear bombs used in Hiroshima and Nagasaki attack in Japan**.
- Efforts to control the spread of WMD are enshrined in international agreements such as:
 - [Nuclear Non-proliferation Treaty of 1968](#)
 - [Biological Weapons Convention of 1972](#)
 - [Chemical Weapons Convention of 1993](#)
- **India has not signed the Nuclear Non-proliferation Treaty, but is signatory to both Biological Weapons Convention and Chemical Weapons Convention.**

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Recently, the USA decided to support India’s membership in multi-lateral export control regimes called the “Australia Group” and the “Wassenaar Arrangement”. What is the difference between them? (2011)

1. The Australia Group is an informal arrangement which aims to allow exporting countries to minimize the risk of assisting chemical and biological weapons proliferation, whereas the Wassenaar Arrangement is a formal group under the OECD holding identical objectives.
2. The Australia Group comprises predominantly of Asian, African and North American countries whereas the member countries of Wassenaar Arrangement are predominantly from the European Union and American Continents.

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: (d)

Exp:

- The Australia Group is a multilateral export control regime and an informal group of countries (now joined by the European Commission) established in 1985 (after the use of chemical weapons by Iraq in 1984) to help member countries to identify those exports which need to be controlled so as not to contribute to the spread of chemical and biological weapons.
- The Wassenaar Arrangement, formally established in July 1996 is a voluntary export control regime for Conventional Arms and Dual-Use Goods and Technologies is a multilateral export control regime.
 - The Wassenaar Arrangement is a grouping of 42 countries, of which India is the latest entrant.

Q. With reference to ‘Organization for the Prohibition of Chemical Weapons (OPCW)’, consider the following statements: (2016)

1. It is an organization of the European Union in working relation with NATO and WHO.
2. It monitors the chemical industry to prevent new weapons from emerging.
3. It provides assistance and protection to States (Parties) against chemical weapons threats.

Which of the statements given above is/are correct?

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

Ans: (b)

Exp:

- The coming into force of the Chemical Weapons Convention (CWC) on 29th April, 1997 led to the establishment of international chemical weapons disarmament regime headed by the Organisation for the Prohibition of Chemical Weapons (OPCW).
- Its headquarters are in the Hague, Netherlands

Source: IE

Wage Rate Revised Under MGNREGA

For Prelims: Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Minimum Wages Act, 1948, Dr. Anoop Satpathy Committee.

For Mains: Poverty, Government Policies & Interventions, Issues Relating to Development, MGNREGA and related Issues.

Why in News?

Recently, the Ministry of Rural Development has notified fresh wage rates under [Mahatma Gandhi National Rural Employment Guarantee Act \(MGNREGA\)](#) for [financial year 2022-23](#).

- The wage rates are notified under the [Mahatma Gandhi National Rural Employment Guarantee Act, 2005](#).
- The MGNREGA wage rates are fixed according to changes in the [CPI-AL \(Consumer Price Index-Agriculture Labour\)](#), which reflects the increase in the [inflation](#) in rural areas.

What are the Revised Rates?

- 21 out of 34 states and Union Territories getting less than 5 % increase and **10 states getting more than 5 % hike**.
 - Of the 31 states and UTs, which saw a hike in wages, the **maximum 7.14 % has been recorded in Goa**.
 - The **lowest increase of 1.77 % is in Meghalaya**.
- There is **no change in the wage rates** of three states – **Manipur, Mizoram and Tripura**.

What is MGNREGA?

- **About:** MGNREGA is **one of the largest work guarantee programmes in the world**.
 - The primary objective of the scheme is to **guarantee 100 days of employment** in every financial year to **adult members of any rural household** willing to do public work-related unskilled manual work.
- **Legal Right to Work:** Unlike earlier employment guarantee schemes, the act **aims at addressing the causes of chronic poverty** through a rights-based framework.
 - At least **one-third of beneficiaries have to be women**.

- Wages must be paid according to the statutory minimum wages specified for agricultural labourers in the state under the [Minimum Wages Act, 1948](#).
- **Demand-Driven Scheme:** The most important part of MGNREGA's design is **its legally-backed guarantee for any rural adult to get work within 15 days of demanding it**, failing which an 'unemployment allowance' must be given.
 - This demand-driven scheme enables the self-selection of workers.
- **Decentralised planning:** There is an emphasis on strengthening the process of decentralisation by giving a significant role in [Panchayati Raj Institutions \(PRIs\)](#) in planning and implementing these works.
 - The act **mandates Gram sabhas to recommend the works that are to be undertaken** and at least 50% of the works must be executed by them.

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What are the Issues Associated With Implementation of Scheme?

- **Delay and Insufficiency in Funds Dispersal:** Most states have failed to disburse wages within 15 days as mandated by MGNREGA. In addition, **workers are not compensated for a delay in payment of wages**.
 - This has turned the scheme into a supply-based programme and subsequently, **workers had begun to lose interest in working under it**.
 - There is ample evidence by now, including an admission by the Ministry of Finance, that **delays in wage payments are a consequence of insufficient funds**.

- **Caste Based Segregation:** There were significant variations in delays by caste. While 46% of payments to **SC (Scheduled Caste)** workers and 37% for **ST (Scheduled Tribes)** workers were completed in the mandated seven-day period, it was a dismal 26% for non-SC/ST workers.
 - The **negative impact of caste-based segregation was felt acutely in poorer States** such as Madhya Pradesh, Jharkhand, Odisha and West Bengal.
- **Ineffective Role of PRI:** With very little autonomy, gram panchayats are not able to implement this act in an effective and efficient manner.
- **Large Number of Incomplete works:** There has been a delay in the completion of works under MGNREGA and **inspection of projects has been irregular.** Also, there is an issue of quality of work and asset creation under MGNREGA.
- **Fabrication of Job cards:** There are several issues related to the existence of **fake job cards, the inclusion of fictitious names, missing entries and delays** in making entries in job cards.

Way Forward

- There is a **need for better coordination between various government departments** and the mechanism to allot and measure the work.
- Some **discrepancies in the payouts need to be addressed**, too. Women in the sector, on an average, earn 22.24% less than their male counterparts.
- State governments **must ensure that public work gets started in every village. Workers turning up at the worksite should be provided** work immediately, without much delay.
- Local bodies **must proactively reach out to returned and quarantined migrant workers** and help those in need to get job cards.
- **Gram panchayats need to be provided with adequate resources**, powers, and responsibilities to sanction works, provide work on demand, and authorise wage payments to ensure there are no delays in payments.
- MGNREGA should be converged with other schemes of the government. For example, Green India initiative, **Swachh Bharat Abhiyan** etc.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Among the following who are eligible to benefit from the “Mahatma Gandhi National Rural Employment Guarantee Act”? (2011)

- Adult members of only the scheduled caste and scheduled tribe households
- Adult members of below poverty line (BPL) households
- Adult members of households of all backward communities
- Adult members of any household

Ans: (d)

Source: IE

Natural Farming

For Prelims: Natural Farming, Zero-Budget Natural Farming (ZBNF), Bhartiya Prakritik Krishi Paddhati Programme (BPKP), Paramparagat Krishi Vikas Yojana (PKVY), Carbon Sequestration, National Mission on Sustainable Agriculture.

Why in News?

The Ministry for Agriculture and Farmers Welfare has inaugurated the Comprehensive Training Programme on [Natural Farming](#), organised by the **National Institute of Agricultural Extension Management (MANAGE)**.

- MANAGE was established in 1987 as the Indian response to **challenges of agricultural extension in a rapidly growing and diverse agriculture sector**.
- In practical terms, **extension means** giving farmers knowledge of agronomic techniques and skills to improve their productivity, food security and livelihoods.

What is Natural Farming?

- It can be defined as a **“chemical- free farming and livestock based ”**. Soundly grounded in agro-ecology, it is a **diversified farming system that integrates crops, trees and livestock**, allowing the optimum use of functional biodiversity.
- It **holds the promise of enhancing farmers’ income while delivering many other benefits**, such as restoration of soil fertility and environmental health, and mitigating and/or reducing greenhouse gas emissions.
 - This farming approach was **introduced by Masanobu Fukuoka**, a Japanese farmer and philosopher, in his 1975 book *The One-Straw Revolution*.
- It builds on natural or ecological processes that exist in or around farms. Internationally, Natural Farming is **considered a form of regenerative agriculture**—a prominent strategy to save the planet.
- It has the **potential to manage land practices and sequester carbon from the atmosphere** in soils and plants, where it is actually useful instead of being detrimental.
- In India, **Natural farming is promoted as Bhartiya Prakritik Krishi Paddhati Programme (BPKP) under [Paramparagat Krishi Vikas Yojana \(PKVY\)](#)**.
 - BPKP is aimed at promoting traditional indigenous practices which reduce externally purchased inputs.
- Natural Farming, as the **name suggests, is the art, practice and, increasingly, the science** of working with nature to achieve much more with less.



COMPONENTS OF NATURAL FARMING



Beejamrit

The process includes treatment of seed using cow dung, urine and lime based formulations.

Whapasa

The process involves activating earthworms in the soil in order to create water vapor condensation.



Jivamrit

The process enhances the fertility of soil using cow urine, dung, flour of pulses and jaggery concoction.

Mulching

The process involves creating micro climate using different mulches with trees, crop biomass to conserve soil moisture.

Plant Protection

The process involves spraying of biological concoctions which prevents pest, disease and weed problems and protects the plant and improves their soil fertility.

What is the Significance of Natural Farming?

- **Minimised Cost Of Production:**
 - It is considered as a cost- effective farming practice with scope for raising employment and rural development.
- **Ensures Better Health:**
 - As Natural Farming does not use any synthetic chemicals, health risks and hazards are eliminated. The food has higher nutrition density and therefore offers better health benefits.
- **Reduced Water Consumption:**
 - By working with diverse crops that help each other and cover the soil to prevent unnecessary water loss through evaporation, Natural Farming optimises the amount of 'crop per drop'.
- **Rejuvenates Soil Health:**
 - The most immediate impact of Natural Farming is on the biology of soil—on microbes and other living organisms such as earthworms. Soil health depends entirely on the living organisms in it.
- **Environment Conservation:**
 - It ensures better soil biology, improved agrobiodiversity and a more judicious usage of water with much smaller carbon and nitrogen footprints.
- **Livestock Sustainability:**
 - The integration of livestock in the farming system plays an important role in Natural farming and helps in restoring the ecosystem. Eco Friendly bio-inputs, such as Jivamrit and Beejamrit, are prepared from cow dung and urine, and other natural products.
- **Resilience:**
 - The changes in soil structure with the help of organic carbon, no/low tillage and plant

diversity are supporting plant growth even under extreme situations like **severe droughts and withstanding severe flood and wind damage during cyclones.**

- NF impacts many farmers positively by imparting resilience to the crops against weather extremities.

What are the Differences between Natural Farming and Organic Farming?	
Organic Farming	Natural Farming
In organic farming, organic fertilizers and manures like compost, vermicompost, cow dung manure, etc. are used and added to farmlands from external sources.	In natural farming, neither chemical nor organic fertilizers are added to the soil. In fact, no external fertilizers are added to soil or given to plants whatsoever.
Organic farming still requires basic agro practices like plowing, tilling, mixing of manures, weeding, etc. to be performed.	In natural farming, decomposition of organic matter by microbes and earthworms is encouraged right on the soil surface itself, which gradually adds nutrition in the soil, over the period.
Organic farming is still expensive due to the requirement of bulk manures, and it has an ecological impact on surrounding environments; whereas, natural agriculture is an extremely low-cost farming method, completely molding with local biodiversity.	In natural farming there is no plowing, no tilling of soil and no fertilizers, and no weeding is done just the way it would be in natural ecosystems.

What are the Other Initiatives related to Agriculture?

- **Rainfed Area Development (RAD):** It focuses on Integrated Farming System (IFS) for enhancing productivity and minimizing risks associated with climatic variabilities.
- **Sub-mission on Agro Forestry (SMAF):** It aims to encourage farmers to plant multi-purpose trees together with the agriculture crops for climate resilience and an additional source of income to the farmers, as well as enhanced feedstock to inter alia wood-based and herbal industry.
- **National Mission on Sustainable Agriculture (NMSA),** to develop, demonstrate and disseminate the techniques to make agriculture resilient to adverse impacts of climate change.
- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER):** It is a **Central Sector Scheme**, a sub-mission under NMSA, aims to develop certified organic production in a value chain mode.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** It was launched in 2015 to address the issues of water resources and provide a permanent solution that envisages Per Drop More Crop.

Way Forward

- The world's **population is predicted to expand to approximately 10 billion by 2050.** It is expected that agricultural demand will increase up to 50%, in comparison to 2013, in such a situation a transformational process towards 'holistic' approaches such as agro-ecology, agroforestry, climate-smart agriculture, and conservation agriculture is a necessity.
- There is a **need to strengthen agricultural market infrastructure** and extend the procurement mechanism to all foodgrain and non-foodgrain crops to all States.
- **MGNREGS ((Mahatma Gandhi National Rural Employment Guarantee Act) must also be linked with farm work** in order to reduce the cost of cultivation which has escalated at a faster pace over the past few years.

Source: PIB

One Health

For Prelims: One Health, National Digital Livestock Mission.

For MAins: One health Concept and its significance. India's One Health Framework.

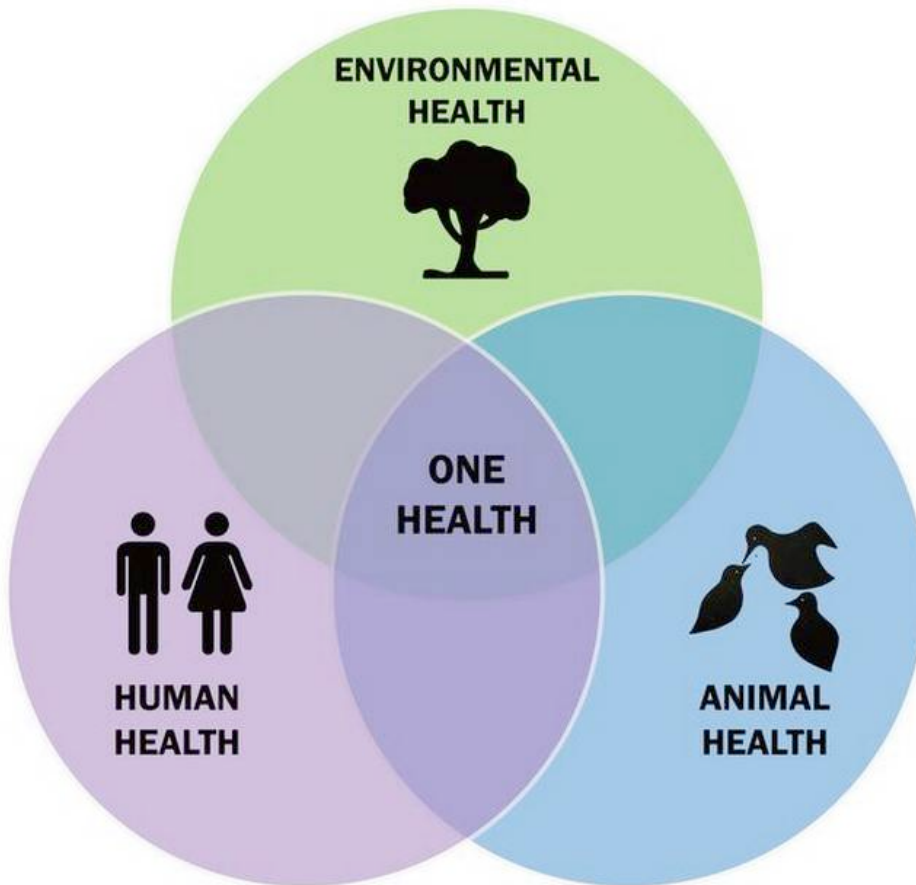
Why in News?

The Ministry of Fisheries, Animal Husbandry and Dairying has launched a **pilot project in the state of Uttarakhand to implement the One Health Framework by One Health Support Unit.**

- The key objective of the Unit is **to develop a national One Health roadmap based on the learnings of the pilot project implementation.**
- Some of the key activities to be undertaken as part of the pilot project include institutionalizing the mechanism for data collection on disease outbreaks, prevalence, management, and development of targeted surveillance plan, integrating network of laboratories, developing and implementing communication strategy across sectors and integration of the data with the digital architecture of the [National Digital Livestock Mission](#).

What is the One Health Concept?

- **About:**
 - One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment.
 - One Health' vision derives its blueprint from the agreement between the tripartite-plus alliance comprising the [Food and Agriculture Organization of the United Nations \(FAO\)](#), the [World Organisation for Animal Health \(OIE\)](#).
 - It's purpose is to encourage collaborations in research and sharing of knowledge at multiple levels across various disciplines like human health, animal health, plants, soil, environmental and ecosystem health in ways that improve, protect and defend the health of all species.



- **Increasing Significance:** It has become more important in recent years because many factors have changed interactions between people, animals, plants, and our environment.
 - **Human Expansion:** Human populations are growing and expanding into new geographic areas due to which close contact with animals and their environments provides more opportunities for diseases to pass between animals and people.
 - Of the contagious diseases affecting humans, more than 65% are of zoonotic or animal to man origin.
 - **Environmental Disruptions:** Disruptions in environmental conditions and habitats can provide new opportunities for diseases to pass to animals.
 - **International Travel & Trade:** The movement of people, animals, and animal products has increased from international travel and trade due to which diseases can spread quickly across borders and around the globe.
 - **Viruses in Wildlife:** Scientists have observed that there are more than 1.7 million viruses circulating in wildlife, and many of them are likely to be zoonotic.
 - This implies that unless there is timely detection, India risks facing many more pandemics in times to come.

What is India's One Health Framework?

- In keeping with the long-term objectives, India established a National Standing Committee on Zoonoses as far back as the 1980s.
- Further, the Department of Animal Husbandry and Dairying (DAHD) has launched several schemes to mitigate the prevalence of animal diseases.
 - In addition, DAHD will soon establish a 'One Health' unit within the Ministry.
- Additionally, the government is working to revamp programmes that focus on capacity building for veterinarians and upgrading the animal health diagnostic system such as Assistance to States for Control of Animal Diseases (ASCAD).
- Recently, funds were sanctioned for setting up a 'Centre for One Health' at Nagpur.
- Also, the Department of Biotechnology has launched the country's first [One Health consortium](#).

Way Forward

- The [Covid-19 pandemic](#) showed the relevance of 'One Health' principles in the governance of infectious diseases, especially efforts to prevent and contain [zoonotic diseases](#) throughout the world.
- India needs to scale up such a model across the country and to establish meaningful research collaborations across the world.
- There is a need to develop best-practice guidelines for informal market and slaughterhouse operation (e.g., inspections, disease prevalence assessments), and creating mechanisms to operationalise 'One Health' at every stage down to the village level.
- Awareness generation, and increased investments toward meeting 'One Health' targets is the need of the hour.

[Source: PIB](#)

World Health Day

For Prelims: World Health Day, National Medical Commission (NMC) Act, 2019, Pradhan Mantri Bhartiya Janaushadhi Pariyojana, Pradhan Mantri - Jan Arogya Yojana, India's Health Index, SAMRIDH Initiative

For Mains: World Mental Health Day and its importance, Current Healthcare Landscape in India

Why in News?

Every year 7th April marks the celebration of [World Health Day](#).

- [World Mental Health Day](#) is observed on **10th October every year**.



What are the Key Highlights about World Health Day?

- **About:**
 - Its idea was conceived at the **First Health Assembly in 1948** and it came into effect in **1950**.
 - It is being celebrated today to mark the foundation of the [World Health Organization \(WHO\)](#) on 7th April 1948.
 - Over the years, it has **brought to light important health issues** such as [mental health](#), maternal and child care and [climate change](#).
- **Aim:**
 - To **create awareness** of a specific health theme to highlight a priority area of concern for the **WHO**.
- **Theme for 2022:**
 - Our Planet, Our Health

What is the Need to Recognise the Day?

- **Rising Deaths due Environmental Causes:**
 - Around the world, **13 million deaths are caused due to avoidable environmental causes**.
 - This includes the climate crisis which is the single biggest health threat facing humanity.
- **Rising Air Pollution:**
 - Over [90% of people breathe unhealthy air](#) resulting from burning of [fossil fuels](#).
- **Impact of Pandemic:**
 - The [pandemic](#) has revealed weaknesses in all areas of society and underlined the urgency of creating sustainable well-being societies committed to achieving equitable health now and for future generations without breaching ecological limits.
- **Rising Extreme Weather Events:**
 - Extreme weather events, [land degradation](#) and water scarcity are displacing people and affecting their health.
- **Rising Pollution and Plastics:**
 - [Pollution and plastics](#) are also affecting people's lives and have made their way into our food chain.
- **Inequitable Distribution of Income:**
 - The **present design of the economy leads to inequitable distribution of income, wealth and power**, with too many people still living in poverty and instability.

What is the Current Healthcare Landscape in India?

- Although **India's healthcare sector has grown rapidly over the last five years** ([Compound Annual Growth Rate](#) of 22%), [Covid-19](#) has brought to the forefront persistent challenges such as a weak health system, lack of quality infrastructure, and lack of quality service delivery to vulnerable populations.
- **India's healthcare spending is 3.6% of [Gross Domestic Product \(GDP\)](#)**, including out-of-pocket and public expenditure.
 - The combined total **government expenditure** of both central and state is **1.29% of GDP**.
 - India spends the least among [BRICS](#) countries: Brazil spends the most (9.2%), followed by South Africa (8.1%), Russia (5.3%), China (5%).
- The Government of India has launched the flagship initiative [Ayushman Bharat \(AB\) Pradhan Mantri Jan Arogya Yojana \(PM-JAY\)](#) the **world's largest non-contributory Government-sponsored health insurance scheme** that enables increased access to in-patient healthcare for poor and vulnerable families in secondary and tertiary facilities.

What are Related Initiatives for the Health Sector?

- [National Medical Commission \(NMC\) Act, 2019](#)

- [Pradhan Mantri Bhartiya Janaushadhi Pariyojana](#)
- [Pradhan Mantri - Jan Arogya Yojana.](#)
- [India's Health Index](#)
- [SAMRIDH Initiative](#)

[Source: DTE](#)

District Ganga Committees and Namami Gange

For Prelims: Namami Gange Programme, District Ganga Committees, National Mission for Clean Ganga.

For Mains: Significance of Namami Gange Programme in the Rejuvenation of River Ganga.

Why in News?

The Ministry of Jal Shakti has launched the **'Digital Dashboard for District Ganga Committees (DGCs) Performance Monitoring System'** (GDPMS) under [Namami Gange Programme](#).

- The Digital Dashboard has been devised to help the DGCs in **enhancing people-river connections**.

What are District Ganga Committees?

- District Ganga Committees were constituted in the districts on the [Ganga River basin](#) for putting in place a mechanism at the district level to ensure people's participation in management and pollution abatement in river Ganga and its tributaries.
- The DGCs are mandated to ensure proper utilization of assets created under Namami Gange, monitor drains/sewage falling in River Ganga and its tributaries, and create a strong connect of people with Ganga rejuvenation.

What is Namami Gange?

- Namami Gange Programme **is an Integrated Conservation Mission, approved as a 'Flagship Programme'** by the Union Government in June 2014 to accomplish the twin objectives of effective abatement of pollution and conservation and rejuvenation of National River Ganga.
- It is being **operated under the Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti**.
- The program is being implemented by the [National Mission for Clean Ganga \(NMCG\)](#), and its state counterpart organizations i.e State Program Management Groups (SPMGs).
- NMCG is the implementation wing of [National Ganga Council](#) (set in 2016; which replaced the National Ganga River Basin Authority - NGRBA).
- It has a Rs. 20,000-crore, centrally-funded, non-lapsable corpus and consists of nearly 288 projects.
- **The main pillars of the programme are:**
 - Sewage Treatment Infrastructure
 - River-Front Development

- River-Surface Cleaning
- Biodiversity
- Afforestation
- Public Awareness
- Industrial Effluent Monitoring
- Ganga Gram

What are the Related Initiatives?

- **Ganga Action Plan:** It was the first River Action Plan that was taken up by the Ministry of Environment, Forest and Climate Change in 1985, to improve the water quality by the interception, diversion, and treatment of domestic sewage.
 - The National River Conservation Plan is an extension to the Ganga Action Plan. It aims at cleaning the Ganga river under Ganga Action Plan phase-2.
- **National River Ganga Basin Authority (NRGBA):** It was formed by the Government of India in the year 2009 under Section-3 of the Environment Protection Act, 1986.
 - It declared the Ganga as the 'National River' of India.
- **Clean Ganga Fund:** In 2014, it was formed for cleaning up of the Ganga, setting up of waste treatment plants, and conservation of biotic diversity of the river.
- **Bhuvan-Ganga Web App:** It ensures involvement of the public in monitoring of pollution entering into the river Ganga.
- **Ban on Waste Disposal:** In 2017, the [National Green Tribunal](#) banned the disposal of any waste in the Ganga.

What is the Ganga River System?

- The headwaters of the Ganga called the 'Bhagirathi' are fed by the Gangotri Glacier and joined by the Alaknanda at Devprayag in Uttarakhand.
- At Haridwar, Ganga emerges from the mountains to the plains.
- The Ganga is joined by many tributaries from the Himalayas, a few of them being major rivers such as the Yamuna, the Ghaghara, the Gandak and the Kosi.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. Which of the following are the key features of 'National Ganga River Basin Authority (NGRBA)'? (2016)

1. River basin is the unit of planning and management.
2. It spearheads the river conservation efforts at the national level.
3. One of the Chief Ministers of the States through which the Ganga flows becomes the Chairman of NGRBA on rotation basis.

Select the correct answer using the code given below:

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

Ans: (a)

- Central Government in exercise of the powers conferred under the Environment (Protection) Act, 1986 on 20th Feb 2009 had set up 'National Ganga River Basin Authority' (NGRBA) as an empowered planning, financing, monitoring and coordinating authority for the Ganga River.

- Prime Minister is the ex-officio Chairperson of the Authority, and it has as its members, the concerned Union Ministers and the Chief Ministers of states through which Ganga flows, viz., Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and West Bengal, among others. **Hence, 3 is not correct.**

[Source: PIB](#)

Ganoderma Lucidum: Magical Mushroom

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](#)

XE Variant of the Coronavirus

Why in News?

Recently, a **50-year-old woman in Mumbai**, may have been **infected with the newly-discovered 'XE' [variant of the coronavirus.](#)**

- XE is a sub-variant of **Omicron**, which caused the **[third wave of Covid-19](#)**, which had not been found in India until now.
- So far, there is **no indication that it is more dangerous than other variants.**

What is the XE Variant of Coronavirus?

- The Omicron variant, which is responsible for over **90% of the infections** detected in 2022, has two **prominent sub-variants**, called **BA.1 and BA.2.**
- The XE variant is what is called a '**recombinant**'. This means it contains the **[mutations found in BA.1 as well as BA.2 varieties of Omicron.](#)**
 - Recombinant variants are **not uncommon.**
 - For example, variants that contain the **characteristic mutations of Delta and Omicron**

have also been identified.

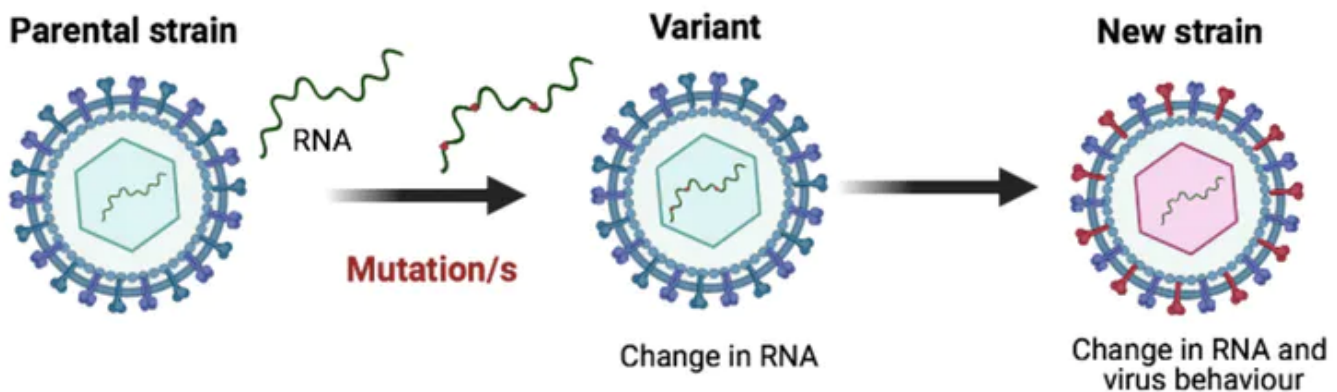
- This was first discovered in the United Kingdom in January 2022, and so far more than **600 samples of XE have been found in different countries.**
- In fact, variants that contain the characteristic mutations of **Delta and Omicron have also been identified.**

Is there a Threat from XE?

- As of now, there is **no evidence to show that the XE variant** is significantly different from the other varieties of Omicron.
- However, this variant is noticed to be about **10% more transmissible** than the dominant **BA.2 variant.**
 - In India, it was the BA.2 that was the **most dominant during the third wave.**
- Nevertheless, a **fresh wave of infections in India can never be ruled out**, considering that the virus has not been eliminated, and is also undergoing mutations.

How are New Variants Formed?

- When a virus multiplies it **doesn't always manage to produce an exact copy of itself.**
- This means that, over time, the virus may start to **differ slightly in terms of its genetic sequence.**



- Any changes to the viral genetic sequence during this process is **known as a Mutation.**
- Viruses with **new mutations are sometimes called Variants.** Variants can differ by one or multiple mutations.
- When a new variant has different functional properties to the original virus and becomes established in a population, it is sometimes referred to as a **New Strain of the virus.**
 - All strains are variants, but **not all variants are strains.**

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Q. In the context of the developments in Bioinformatics, the term 'transcriptome', sometimes seen in the news, refers to (2016)

- (a) a range of enzymes used in genome editing
- (b) the full range of mRNA molecules expressed by an organism
- (c) the description of the mechanism of gene expression
- (d) a mechanism of genetic mutations taking place in cells

Ans: (b)

- Transcriptome is the full range of messenger RNA, or mRNA molecules expressed by an organism. The term, 'transcriptome' can also be used to describe the array of mRNA transcripts produced in a

particular cell or tissue type.

- In contrast with the genome, which is characterised by its stability, the transcriptome actively changes. In fact, an organism's transcriptome varies depending on many factors, including stage

Q. Consider the following:

1. Bacteria
2. Fungi
3. Virus

Which of the above can be cultured in an artificial / synthetic medium?

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

Ans: (a)

Exp:

- Bacteria and Fungi can be cultured in an artificial/ synthetic medium. Whereas viruses require a living host cell for replication.
- Infected host cells (eukaryotic or prokaryotic) can be cultured and grown, and then the growth medium can be harvested as a source of the virus.

Source: IE

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