



Chinese Vessel in Sri Lanka

For Prelims: Yuan Wang Vessel, Indian & Sri Lanka Relations

For Mains: Effect of Policies & Politics of Countries on India's Interests, India and its Neighbourhood, India-Sri Lanka Relations

Why in News?

Recently, China's **satellite tracking vessel Yuan Wang 5** has arrived at **Sri Lanka's southern Hambantota Port**, despite **India and the U.S. voicing concern with Colombo over the military ship's visit**.



What do we know about Yuan Wang 5 & Hambantota Port?

- **Yuan Wang 5:**
 - It is a **third-generation vessel of the Yuan Wang series** that entered service in 2007.
 - This series of ships include "**space tracking ships involved in supporting the manned space programme**".
 - It has the ability to **track satellites and intercontinental missiles**.
- **Hambantota Port:**
 - **Hambantota International Port Group** is a **Public Private Partnership** and a

Strategic Development Project between the **Government of Sri Lanka** and **China Merchants Port Holdings (CMPort)**.

- This port was **given to China by Sri Lanka on a 99-year lease** after Sri Lanka failed to repay Chinese loans.
 - It is seen as a case of Chinese ["debt trap"](#) **Diplomacy**.

Why is China's Presence in Sri Lanka a Concern for India?

- **Recently, China's presence in Sri Lanka has increased on a large scale.**
 - China is the **largest bilateral creditor to Sri Lanka**.
 - Its loans to the Sri Lankan public sector amount to **15% of the central government's external debt**.
 - Sri Lanka heavily relies on Chinese credit to address its **foreign debt burden**.
 - China extended about **USD 2.8 billion to Sri Lanka** soon after the [pandemic](#) hit but has not stepped in much in 2022, even as the [island's economy collapsed](#) rapidly.
 - China has invested about USD 12 billion in **Sri Lanka's infrastructure projects between 2006-19**.
 - China enjoys **friendlier waters in South Asia** and the **Indian Ocean** than it does in Southeast Asia and the Pacific.
 - China faces opposition from Taiwan, territorial disputes in the South China Sea and East Asia, and myriad frictions with the US and Australia.
- **India's Concern due to China's Presence:**
 - Sri Lanka has decided to establish a [Special Economic Zone](#) around the **Colombo port city** and a new economic commission, to be funded by China.
 - The Colombo port handles **60% of India's trans-shipment cargo**.
 - Leasing of Hambantota and the Colombo Port City project makes it almost certain for the Chinese navy to **have a permanent presence in the Indian Ocean** which will be worrisome for India's national security.
 - This Chinese strategy to encircle India is referred to as the [Strings of Pearls Strategy](#).
 - Other South Asian nations like **Bangladesh, Nepal and the Maldives** have also been turning to China to **finance large-scale infrastructure projects**.

What should be India's Approach Moving Forward?

- **Preserving Strategic Interests:**
 - Nurturing the [Neighbourhood First policy](#) with Sri Lanka is important for India to preserve its strategic interests in the **Indian Ocean region**.
- **Taking Advantage of Regional Platforms:**
 - Platforms like the [BIMSTEC](#), [SAARC](#), [SAGAR](#) and the [IORA](#) could be leveraged to foster cooperation in fields like [technology-driven agriculture](#), [marine sector development](#), [IT & communication infrastructure](#) etc.
- **Restraining Chinese Expansion:**
 - India will need to continue to work on the **Kankasanturai port in Jaffna** and the oil tank farm project in [Trincomalee](#) to ensure that **China does not make any further inroads in Sri Lanka**.
 - Both countries can also **cooperate on enhancing private sector investments** to create economic resilience.
- **Leveraging India's Soft Power:**
 - In the technology sector, **India can create job opportunities in Sri Lanka** by expanding the **presence of its IT companies**.
- These organizations **can create thousands of direct and indirect jobs** and boost the **island nation's service economy**.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. Consider the following statements: (2020)

1. The value of Indo-Sri Lanka trade has consistently increased in the last decade.
2. "Textile and textile articles" constitute an important item of trade between India and Bangladesh.
3. In the last five years, Nepal has been the largest trading partner of India in South Asia.

Which of the statements given above is/are correct?

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

Ans: (b)

Exp:

- As per data from the Department of Commerce, Indo- Sri Lanka bilateral trade value for a decade (2007 to 2016) was 3.0, 3.4, 2.1, 3.8, 5.2, 4.5, 5.3, 7.0, 6.3, 4.8 (in billion USD). It reflects continuous fluctuation in the trend of trade value. There has been an overall increase but the same cannot be said as consistent rise in trade value. Hence statement 1 is not correct.
- Bangladesh has been a major textile trading partner for India, with a share of more than 5% in exports and over 7% in imports. While annual textile exports to Bangladesh averages \$2,000 million, imports are worth \$400 (Year: 2016-17).
- The major items of exports are fibre and yarn of cotton, man-made staple fibres and an-made filaments while major import items include apparel and clothing, fabric and other made up textile articles. Hence, statement 2 is correct.
- According to the data, in 2016-17, Bangladesh is India's largest trading partner in South Asia, followed by Nepal, Sri Lanka, Pakistan, Bhutan, Afghanistan and Maldives. The level of Indian exports also follows the same order. Hence, statement 3 is not correct.
- **Therefore, option (b) is the correct answer.**

Mains

Q. What do you understand by 'The String of Pearls'? How does it impact India? Briefly outline the steps taken by India to counter this. **(2013)**

Q. In respect of India-Sri Lanka relations, discuss how domestic factors influence foreign policy. **(2013)**

Source: TH

India-Gabon Relations

For Prelims: UNSC, NAM, ISA

For Mains: India-Gabon Relations and its significance

Why in News?

Recently, A delegation from Gabon visited India and interacted with the Indian business community, also India congratulated Gabon on its **Independence Day (17th August)**.

- Earlier, the Vice President of India visited Gabon, where he signed two **MoUs (Memorandum of Understanding)**.



What are the MoUs?

- **Establishment of a Joint Commission** between the Governments of India and Gabon.
- Diplomats' training institutes, Sushma Swaraj Institute of Foreign Services and Gabonese Ministry of Foreign Affairs.
 - India signed to work with **Gabon to strengthen cooperation in various spheres** at bilateral, regional, and multilateral levels.

How has been the India-Gabon Partnership?

- **Diplomatic:**

- India and Gabon have **enjoyed warm and friendly relations dating back to the pre-independence era** of Gabon.
- Former Vice President of India visited the African nation of Gabon in May 2022 making it the **first-ever high-level visit of India to Gabon.**
- Both India and Gabon are **currently serving as non-permanent members** of the [UNSC \(United Nation Security Council\)](#).
- **Business and Trade:**
 - The Bilateral trade between both nations reached USD 1.12 billion in 2021-22.
 - India is the **2nd largest destination for Gabonese exports.**
 - In the business sector, more than **50 Indian companies are engaged in the Gabon Special Economic Zone.**
- **Cooperation on International Forum:**
 - Both India and Gabon are members of the [Non-Aligned Movement \(NAM\)](#).
 - NAM focuses on **mainstream contemporary issues of relevance to the developing world.**
 - Gabon **supports India's candidature at various international forums.**
 - India congratulated Gabon for getting elected as a non-permanent member of UN Security Council for the term 2022-23.
 - India supported for the Common African Position enshrined in **the Ezulwini Consensus and Sirte Declaration.**
 - The **Ezulwini Consensus** is a position on international relations and reform of the United Nations, agreed by the African Union.
 - It calls for a more representative and democratic Security Council, in which Africa, like all other world regions, is represented.
 - The **Sirte Declaration (1999)** was the resolution adopted to establish the African Union.
- **International Solar Alliance:**
 - Gabon was among the first countries **to sign and ratify the [International Solar Alliance agreement.](#)**
 - India conveyed **to extend all possible assistance to Gabon to achieve its renewable energy targets.**
 - Gabon plans to have **100% clean energy by 2030.**
- **Education:**
 - A number of Gabonese nationals pursue scholarship/training programs offered by India under the Indian Technical and Economic Cooperation (ITEC) and ICCR schemes.
- **Energy Cooperation:**
 - India imported about USD 670 million worth crude oil from Gabon in 2021-22, making it an **important partner for India's energy security** requirement.
- **Indian Diaspora:**
 - People from the Indian community are basically engaged **in infrastructure projects, trading, export of timber and metal scrap.**
 - The Indian diaspora have been making significant contributions in various fields in Gabon.
 - The Indian community in Gabon has kept Indian culture alive and major Indian festivals are celebrated by the entire community together.

Way Forward

- There is a need to Explore India-Gabon cooperation in green energy, services, health, and agriculture among other sectors.
- Both countries should broaden their economic partnership **to attract investments.**
- There is plethora of possibilities for cooperation in Agriculture such as knowledge transfer in **the farming sector from India to Gabon.**

[Source: BS](#)

Period Poverty

For Prelims: Period Products Act, Government's Initiatives

For Mains: State of Menstrual Health in India, Issues related to women, Gender

Why in News?

Scotland has become the first nation in the world to legally protect the **right to access free period products** and have made **period products free for all** by passing the **Period Products Act**.

- Period poverty is when those on low incomes can't afford, or access, suitable period products.



What do we know about the Development in Scotland?

- **About:**
 - Under the **Period Products Act**, schools, colleges and universities as well as local government bodies must **make a range of period products available for free in their bathrooms**.
 - **Every council in Scotland** is required with local communities to determine the best access point for menstrual products.
- **Accessibility:**
 - A mobile phone app (**PickUpMyPeriod**) also helps people find the nearest place — such as the local library or community center — where they can pick up period products.
 - The period products would be available at libraries, swimming pools, public gyms, community buildings, town halls, pharmacies & doctor's offices.

What has been the state of Menstrual Hygiene in India?

- According to a [United Nations Children's Fund \(UNICEF\) study conducted in 2011](#):
 - Only 13% of girls in India are aware of **menstruation** before menarche.
 - 60% of girls missed school on account of menstruation.
 - 79% faced low confidence due to menstruation and 44% were embarrassed and humiliated over restrictions.
 - Thereby, Menstruation adversely impacts **women's education, equality, maternal and child health**.
- **National Family Health Survey 5:**
 - **Women aged 15-24 years using period products:**
 - **Seventeen states and Union Territories (UTs)** had 90% or more of their women using period products.
 - In Puducherry and the Andaman and Nicobar Islands, the fraction was 99%.
 - Tripura, Chhattisgarh, Assam, Gujarat, Meghalaya, Madhya Pradesh and Bihar – had 70% or fewer of their women using period products.
 - Bihar was the only state to report a figure lower than 60%.
 - **Top three states that reported an increase in the percentage of women using period products from NFHS-4 to NFHS-5:**
 - Bihar: 90%
 - Odisha: 72%
 - Madhya Pradesh: 61%

What Initiatives has the Indian Government taken for Menstrual Hygiene?

- **Shuchi Scheme:**
 - **Shuchi Scheme** aims aimed at **instilling awareness about menstrual hygiene** among adolescent girls.
 - It was started in 2013-14 initially as a **Centrally-sponsored one**.
 - However, the **Centre asked States to take over the scheme from 2015-16**.
- **Menstrual Hygiene Scheme:**
 - **Menstrual Hygiene Scheme** focuses on promotion of menstrual hygiene among adolescent girls (10-19 years) in rural areas of selected districts in 2011.
- **SABLA programme:**
 - It was implemented by the Ministry of Women and Child Development.
 - It focuses on **nutrition, health, hygiene and reproductive and sexual health** (linked to rural mother and childcare centres).
- **National Rural Livelihood Mission:**
 - It supports **self-help groups** and small manufacturers to produce sanitary pads.
- **Swachh Bharat Mission and Swachh Bharat: Swachh Vidyalaya (SB:SV):**
 - Menstrual hygiene management is also an integral part of the **Swachh Bharat Mission**.
- **Guidelines for Gender Issues in Sanitation (2017):**
 - These have been evolved by the **Ministry of Drinking Water and Sanitation** to ensure **gender equality and empowerment of women and girls** with respect to sanitation.
 - Safe and effective menstrual hygiene management is a trigger for better and stronger development for adolescent girls and women.
- **The National Guidelines on Menstrual Hygiene Management:**
 - It was released by the **Ministry of Drinking Water and Sanitation in 2015**.
 - It seeks to address every component of menstrual hygiene ranging from, raising awareness, addressing behaviour change, creating a demand for better hygiene products, capacity building etc.

Way Forward

- The Government of India should also consider the approach as of Scotland's and make the period products available or at reasonable concession/discount.
- The government can also promote small-scale sanitary pad manufacturing units to make low-cost pads more easily available, it will also help in generating income for women.

- The government needs to provide, efforts directed at awareness and education about menstruation and menstrual hygiene, and access to safe products, and responsive [water, sanitation and hygiene \(WASH\) infrastructure](#).
- However, menstrual health cannot be achieved only through governmental efforts without addressing it as a social issue, requiring interventions at societal, community and familial level.

[Source: TH](#)

Validity of Child Gang-Rape Law

For Prelims: Supreme Court, Section 376-DB, Section 376-AB, Indian Penal Code, Article 21, Article 14.

For Mains: Reforms required for Life Imprisonment in Indian Penal System.

Why in News?

Recently, a petition was filed by a 29-year-old man, in the [Supreme Court](#), who is serving a life sentence, for the gang rape of a nine-year-old in Maharashtra.

- The **Supreme Court** will examine the validity of a law which sends a guilty man either to a lifetime in prison or to the gallows for gangraping a child under 12 years without affording him a chance to atone for his crime or reform.

What are the Issues Highlighted in the Petition?

- **Restrict judge's options:**
 - It argued that **Section 376DB (gang rape of a child under 12 years of age)** of the [Indian Penal Code](#) restricted the trial judge's options to either a **sentence for the remainder of the person's natural life or the death penalty**.
 - However, Life imprisonment is the minimum, mandatory punishment under the provision.
- **Anomaly in 2018 Amendment:**
 - The petitioner further argued that there is **an anomaly in the sentencing system drafted through the criminal amendments carried out in August 2018**.
 - Section 376DB was introduced in 2018 when the penal code was **amended to provide harsher sentences for the offense of rape**.
- **Arbitrariness:**
 - While **Section 376-AB** provided for a **minimum sentence of 20 years for a person convicted of raping an under-12 girl**.
 - **Whereas, Section 376-DB provides for a mandatory minimum punishment of life imprisonment for each of the persons involved in the gang rape of an under-12 girl**.
 - Both sections provided the **death penalty as maximum punishment**.
 - This life sentence without remission could mean 60-70 years of jail for a person who is in his twenties.
- **Violates Right to Life:**
 - Section 376DB offered a trial court no option but a life sentence or the higher punishment of the death penalty.
 - The petition argued that Section 376DB violated [Articles 21](#) (Right to life) and **Article 14** (right to equality) of the Constitution.
- **Global Scenario:**

- **Given** the global **context of this** issue, the **European Court of Human Rights** in the case of **Winter vs the United Kingdom** ruled that life **imprisonment** without a **real** prospect of **parole** was a violation of Article 3 of the European Convention on Human Rights.
 - It held that life sentences cannot be considered just punishment as they provided the prisoner with no opportunity for atonement and such sentences were incompatible with respect for human dignity.
 - The U.S. Supreme Court had held that in extreme cases, a disproportionate sentence **violated the Eighth Amendment, which prohibits cruel and unusual punishment, of the U.S. Constitution.**

What's the View of the Supreme Court?

- The SC bench said that this question required consideration, as the SC has already quashed the provision imposing mandatory death sentence as unconstitutional.
 - Further, it asked an additional solicitor general, as well as the petitioner to submit written submissions and propositions on the issue.
- **Historical Perspective:**
 - Also, the SC in '**Mithu Vs Punjab**' in **1983**, had ruled that **Section 303 of IPC was unconstitutional** to the extent it provided for the mandatory death penalty to a person who committed a murder while serving a life sentence in another case.
 - Section 303 had mandated that courts would impose no other punishment but the death penalty in such cases.

What are the Other Related Initiatives for Child Protection?

- [POSCO \(Protection of Children from Sexual Offences\).](#)
- [Child Abuse Prevention and Investigation Unit.](#)
- [Beti Bachao, Beti Padhao.](#)
- [Juvenile Justice Act/Care and Protection Act, 2000.](#)
- [Child Marriage Prohibition Act \(2006\).](#)
- [Child Labour Prohibition and Regulation Act, 2016.](#)

[Source: TH](#)

Himachal Pradesh Freedom of Religion (Amendment) Bill-2022

For Prelims: States that have passed anti conversion laws, Constitutional provisions on freedom of religion, Article 21 of the Constitution.

For Mains: Haryana Prevention of Unlawful Conversion of Religious Bill, 2022, Anti-conversions laws and associated issues, Related Supreme Court judgements.

Why in News?

Recently, the Himachal Pradesh government has proposed the **Himachal Pradesh Freedom of Religion (Amendment) bill 2022**, seeking to **criminalise mass religious conversions.**

- The Bill amends Himachal Pradesh Freedom of Religion Act-2019, which was enacted **with a view to provide freedom of religion by prohibition of conversion from one religion to another.**

Why is the Proposed Amendment?

- Himachal Pradesh Freedom of Religion Act-2019 prohibits conversion from one religion to another by **misrepresentation, force, undue influence, coercion, inducement or any other fraudulent means** or by marriage and for matters connected there with.
- However, there is **no provision to curb mass conversion**.

What are the Key Provisions of the Bill?

- It defines mass conversion as conversion of two or more persons at the same time.
- The maximum sentence has been proposed **to be extended to maximum 10 years and increase the amount of fine**, if a person contravenes the provisions of Section 3 in respect of mass conversion.
 - **Section 3 of the Freedom Act** states that **no person shall convert or attempt to convert**, either directly or otherwise, any other person from one religion to another **by use of misrepresentation, force, undue influence, coercion, inducement or by any fraudulent means or by marriage**.
- Complaints received should be **investigated or inquired into by a police officer not below the rank of sub-inspector**.
- The offences punishable under the Act **would be triable by the sessions court**.
- If a person marries someone by concealing his religion in such a manner that other person believes that his religion is truly the one professed by him **shall be punished with minimum imprisonment of not less than three years** and maximum imprisonment of 10 years.

What is Religious Conversion?

- Religious conversion is the adoption of a set of beliefs identified with one particular religious denomination to the exclusion of others.
- Thus "religious conversion" would **describe the abandoning of adherence to one denomination and affiliating with another**.
 - **For example**, Christian Baptist to Methodist or Catholic, Muslim Shi'a to Sunni.
- In some cases, religious conversion "**marks a transformation of religious identity and is symbolized by special rituals**".

What is the Need for Anti-Conversion Laws?

- **No Right to Proselytize:**
 - The Constitution confers on **each individual the fundamental right to profess, practice and propagate** his religion.
 - Proselytizing is the **act of trying to convert another individual from the converttee's religion** to the converter's religion.
 - The individual right to freedom of conscience and religion **cannot be extended to construe a collective right to proselytize**.
 - For the right to religious freedom belongs equally to the person converting and the individual sought to be converted.
- **Fraudulent Marriages:**
 - In the recent past, several instances have come to the notice that **whereby people marry persons of other religion by either misrepresentation or concealment** of their own religion and after getting married they force such other person to convert to their own religion.
- **SC Observations:**
 - Recently, the Supreme Court took judicial notice of instances of **people marrying by either misrepresentation or concealment** of their own religion.
 - According to the court, such incidents not only infringe the freedom of religion of the persons so converted but also **militate against the secular fabric of our society**.

What is the Status of Anti-Conversion Laws in India?

- **Constitutional Provision:**
 - The Indian Constitution **under Article 25 guarantees the freedom to profess, propagate, and practice religion**, and allows all religious sections to manage their own affairs in matters of religion; subject to public order, morality, and health.
 - However, **no person shall force their religious beliefs and consequently, no person should be forced to practice any religion** against their wishes.
- **Existing Laws:**
 - There has been **no central legislation restricting or regulating religious conversions**.
 - However, since 1954, on multiple occasions, [Private Member Bills](#) have been introduced in (but never approved by) Parliament, to regulate religious conversions.
 - Further, in 2015, the Union Law Ministry stated that **Parliament does not have the legislative competence to pass anti-conversion legislation**.
 - Over the years, several states have **enacted 'Freedom of Religion' legislation to restrict religious conversions** carried out by force, fraud, or inducements.

What are the Issues Associated with Anti-Conversion Laws?

- **Uncertain and Vague Terminology:**
 - The uncertain and vague terminology like **misrepresentation, force, fraud, allurements presents a serious avenue for misuse**.
 - These terms **leave room for ambiguities or are too broad**, extending to subjects far beyond the protection of religious freedom.
- **Antithetical to Minorities:**
 - Another issue is that the **present anti-conversion laws focus more on the prohibition of conversion** to achieve religious freedom.
 - However, the **broad language used by the prohibitive legislation might be used by officials** to oppress and discriminate against minorities.
- **Antithetical to Secularism:**
 - These laws **may pose a threat to the secular fabric of India** and the international perception of our society's intrinsic values and legal system.

What are Supreme Court Judgements on Marriage and Conversion?

- **[Hadiya Judgement 2017:](#)**
 - Matters of dress and of food, of ideas and ideologies, of love and partnership are within the central aspects of identity.
 - Neither the State nor the law can dictate a choice of partners or limit the free ability of every person to decide on these matters.
 - The principle that the right to marry a person of one's choice is integral to [Article 21](#).
- **[K.S. Puttaswamy or 'privacy' Judgment 2017:](#)**
 - The autonomy of the individual was the ability to make decisions in vital matters of concern to life.
- **Other Judgements:**
 - The SC in its various judgments, has held that faith, the state and the courts have no jurisdiction over an adult's absolute right to choose a life partner.
 - India is a **"free and democratic country"** and any interference by the State in an adult's right to love and marry has a "chilling effect" on freedoms.
 - Intimacies of marriage lie within a **core zone of privacy**, which is inviolable and the choice of a life partner, whether by marriage or outside it, is part of an individual's "personhood and identity".
 - The absolute right of an individual to choose a life partner is not in the least affected by matters of faith.

Way Forward

- The governments implementing such laws need to ensure that **these do not curb one's Fundamental Rights** or hamper the national integration instead, these laws need to strike a

balance between freedoms and malafide conversions.

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. Right to Privacy is protected as an intrinsic part of Right to Life and Personal Liberty. Which of the following in the Constitution of India correctly and appropriately imply the above statement? (2018)

- (a) Article 14 and the provisions under the 42nd Amendment to the Constitution.
- (b) Article 17 and the Directive Principles of State Policy in Part IV.
- (c) Article 21 and the freedoms guaranteed in Part III.
- (d) Article 24 and the provisions under the 44th Amendment to the Constitution.

Ans: (c)

Exp:

- In 2017, a nine-judge bench of the Supreme Court (SC) in its verdict in Justice K.S. Puttaswamy v. Union of India case unanimously affirmed that the Right to Privacy is a Fundamental Right under the Indian Constitution.
- The SC bench held that **the privacy is a Fundamental Right** as it is intrinsic to guarantee of life and personal liberty as provided **under Article 21 of the Constitution**.
- The bench also stated that the elements of privacy also arise in varying contexts from the other facets of freedom and dignity recognised and guaranteed by the Fundamental Rights contained in Part III of the Constitution.
- **Therefore, option (c) is the correct answer.**

Mains

Q. How the Indian concept of secularism is different from the western model of secularism? Discuss. (2018)

[Source: IE](#)

National Mission on Interdisciplinary Cyber-Physical Systems

For Prelims: Cyber-Physical Systems, Technology Innovation Hubs, SMART Cities, Sustainable Development Goals (SDGs).

For mains: Objectives and Significance of National Mission on Interdisciplinary Cyber-Physical Systems.

Why in News?

Recently, the Ministry of Science and Technology has organised a workshop to discuss joint research projects under [NM-ICPS \(National Mission on Interdisciplinary Cyber-Physical Systems\)](#).

- A total of 35 joint projects have been identified which will be implemented by **TIHs (Technology Innovation Hubs)** and research institutions from the USA.
- This endeavour will help achieve **collaborative research and development between the two countries in the area of CPS (Cyber-Physical Systems)**.

What are Cyber-Physical Systems?

- **About:**
 - Cyber-physical systems **integrate sensing, computation, control and networking into physical objects and infrastructure**, connecting them to the Internet and to each other.
- **Applications:**
 - **Driverless cars** that communicate securely with each other on smart roads,
 - **Sensors in the home to detect changing health conditions**
 - Improving agricultural practices and **enabling scientists to address issues arising out of climate change**, etc.
- **Significance:**
 - Advances in cyber-physical systems will enable capability, adaptability, scalability, resiliency, safety, security and usability that will far exceed the simple embedded systems of today.

What is National Mission-Interdisciplinary Cyber-Physical Systems?

- **About:**
 - It was launched in 2018 by the Ministry of Science and Technology with an outlay of **Rs. 3,660.00 crore for a period of five years** to encourage innovation in new age technologies.
 - It covers the entire India which includes Central Ministries, State Governments, Industry and Academia.
- **Objectives:**
 - The NM-ICPS is **a comprehensive Mission which would address technology development, application development**, human resource development & skill enhancement, entrepreneurship and start-up development in Cyber Physical System (CPS) and associated technologies.
 - The Mission aims **at the establishment of 15 Technology Innovation Hubs (TIH)**, six Application Innovation Hubs (AIH) and four Technology Translation Research Parks (TTRP).
 - These Hubs & TTRPs will connect to **Academics, Industry, Central Ministries and State Government in developing solutions** at reputed academic, R&D and other organizations across the country in a hub and spoke model.
 - The Hubs & TTRPs have **four focused areas along which the Mission implementation** would proceed, namely:
 - Technology Development,
 - HRD & Skill Development,
 - Innovation, Entrepreneurship & Start-ups Ecosystem Development, and
 - International Collaborations.
- **Significance:**
 - CPS technologies provide **a cutting edge to a Nation's scientific, engineering, and technologically innovative capabilities**, support other missions of the government, provide industrial and economic competitiveness and have truly become a Strategic Resource.
 - The Mission can act as an **engine of growth that would benefit national initiatives in health, education, energy, environment, agriculture**, strategic cum security, and industrial sectors, **Industry 4.0, SMART Cities, Sustainable Development Goals (SDGs)** etc.
 - CPS is an integrated system of upcoming technology, which in turn is being taken up on priority basis by countries in the race for development. **CPS will indeed bring a**

paradigm shift in entire skill sets requirements.

- The job opportunities **will be enhanced through the Mission by imparting advanced skills and generating skilled manpower** as per the requirement of the industry/society.

[Source: PIB](#)

Italy's Lake Garda

Why in News?

Italy's worst **drought** in decades has reduced **Lake Garda**, the country's largest lake, to near its lowest level ever recorded.

- It has exposed **swaths of previously underwater rocks and warmed the water** to temperatures that approach the average in the **Caribbean Sea**.



What do we need to know about the Shrink of Lake Garda?

- **Northern Italy** saw significantly **lower rainfall for months**, and **snowfall in 2022 was also down 70%**, drying up important rivers like the Po, which flows across Italy's agricultural and industrial heartland.

- The **parched condition** of the Po, Italy's longest river, caused billions of euros in losses to farmers who normally rely on it to irrigate fields and rice paddies.
 - To compensate for the loss, **authorities allowed more water from Lake Garda** to flow out to local rivers.
 - But in late July 2022, **they reduced the amount to protect the lake** and the financially important tourism tied to it.
 - With huge amounts of **water being diverted to rivers, the lake recorded its lowest level.**

What do we need to know about Drought?

- **About:**
 - **Drought** is generally considered as a **deficiency in rainfall/precipitation** over an extended period, usually a season or more, resulting in a **water shortage** causing adverse impacts on **vegetation, animals, and/or people.**
- **Types:**
 - **Meteorological Drought:**
 - It is based on the degree of dryness or rainfall deficit and the length of the dry period.
 - **Hydrological Drought:**
 - It is based on the impact of rainfall deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
 - **Agricultural Drought:**
 - It refers to the impact on **agriculture** by factors such as rainfall deficits, soil water deficits, reduced ground water, or reservoir levels needed for irrigation.
 - **Socioeconomic Drought**
 - It considers the **impact of drought conditions** (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods such as fruits, vegetables, grains and meat.
- **Causes:**
 - The **variability in rainfall is a major cause of drought.** The percentage of variability is inversely related to the total rainfall.
 - A deviation in the route of monsoon winds, or an early withdrawal of the monsoon too can also lead to drought conditions in an area.
 - Drought can also be caused due to **forest fires**, making the soil **unsuitable for cultivation and making the soil water deficit.**
 - **Land degradation** in addition to **Climate change** results in an increase in droughts.
- **Way to Tackle:**
 - **Water management:**
 - Saving, reuse of treated water, rainwater harvesting, desalination, or direct use of seawater for salt-loving plants.
 - **Farmer Managed Natural Regeneration (FMNR)**
 - Enabling **native sprouting tree growth** through selective pruning of shrub shoots.
 - The residue from pruned tress **can be used to provide mulching for fields** thus increasing **soil water retention and reducing evaporation.**
 - **Other Measures:**
 - **Buttressing** the soil through sand fences, windbreaks etc.
 - Need for **enriched** and **hyper fertilization of soil.**
 - Install **irrigation devices that are the most water efficient** for each use, such as **micro** and **drip irrigation**, and **soaker hoses.**
- **Indian Government's Initiative:**
 - **[Integrated Watershed Management Programme](#)**
 - **[National Mission on Green India](#)**
 - **Desert Development Programme**
 - launched in 1995 to minimize the adverse effects of drought and to rejuvenate the natural resource base of the identified desert areas.

Prelims

Q. Consider the following pairs: (2014)

Programme/Project Ministry

1. Drought-Prone: Ministry of Area Programme Agriculture
2. Desert Development: Ministry of Programme Environment and Forests
3. National Watershed: Ministry of Rural Development Project Development for Rainfed Areas

Which of the above pairs is/are correctly matched?

- (a) 1 and 2 only
(b) 3 only
(c) 1, 2 and 3
(d) None

Ans: (d)

Exp:

- **The aim of Drought-Prone Area Programme** is to minimise the adverse effects of drought on production of crops and livestock and productivity of land, water and human resources, ultimately leading to drought proofing of the affected areas. It comes **under the Department of Land Resources, Ministry of Rural Development. Hence, pair 1 is not correctly matched.**
- **The objective of the Desert Development Programme** is to minimise the adverse effect of drought and control desertification through rejuvenation of the natural resource base of the identified desert areas. **It comes under the Department of Land Resources, Ministry of Rural Development. Hence, pair 2 is not correctly matched.**
- **National Watershed Development Programme for Rain fed Areas (NWDPA)** is a programme for the conservation, development and sustainable management of natural resources and enhancement of agricultural productivity and production in a sustainable manner. It comes under **Department of Agricultural Cooperation and Farmer Welfare (Ministry of Agriculture and Farmers' Welfare).** Hence, pair 3 is not correctly matched.
- **Therefore, option (d) is the correct answer.**

Q. With reference to agriculture in India, how can the technique of 'genome sequencing', often seen in the news, be used in the immediate future? (2017)

1. Genome sequencing can be used to identify genetic markers for disease resistance and drought tolerance in various crop plants.
2. This technique helps in reducing the time required to develop new varieties of crop plants.
3. It can be used to decipher the host-pathogen relationships in crops.

Select the correct answer using the code given below:

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

Ans: (d)

Exp:

- Chinese scientists decoded rice genome in 2002. The Indian Agricultural Research Institute (IARI) scientists used the genome sequencing to develop better varieties of rice such as Pusa Basmati-1 and Pusa Basmati-1121, which currently makes up substantially in India's rice export. Several transgenic varieties have also been developed, including insect resistant cotton, herbicide tolerant

soybean, and virus resistant papaya. **Hence, 1 is correct.**

- In conventional breeding, plant breeders scrutinize their fields and search for individual plants that exhibit desirable traits. These traits arise spontaneously through a process called mutation, but the natural rate of mutation is very slow and unreliable to produce all the plant traits that breeders would like to see. However, in genome sequencing it takes less time, thus it is more preferable. **Hence, 2 is correct.**
- The host-pathogen interaction is defined as how microbes or viruses sustain themselves within host organisms on a molecular, cellular, organism or population level. The genome sequencing enables the study of the entire DNA sequence of a crop, thus it aids in understanding of pathogens' survival or breeding zone. **Hence, 3 is correct.**
- **Therefore, option (d) is the correct answer.**

Mains

Q. The process of desertification does not have climate boundaries. Justify with examples. **(2020)**

New Elephant Reserve in Tamil Nadu

Why in News?

Recently, the Government of India has announced the notification of one more [Elephant Reserve \(ER\)](#) Agasthiyamalai in Tamil Nadu during a programme in the [Periyar Wildlife Sanctuary in Kerala](#).

- This will be the **32nd Elephant Reserve in the country** after Singphan ER in Nagaland was notified in 2018.
- Agasthiyamalai is Tamil Nadu's 5th Elephant Reserve and also a [Biosphere Reserve](#).

What do we need to know about Indian Elephant?



- **About:**
 - It is also known as “**Elephas maximus**”.
- **Location:**
 - Central and Southern Western Ghats
 - North East India
 - Eastern India
 - Northern India
 - Some parts of Southern Peninsular India.
- **Protection Status:**
 - [IUCN Red List](#): Endangered
 - [CITES](#): Appendix I
 - [Wildlife Protection Act 1972](#): Schedule I
- **Statistics in India:**
 - The population of elephants in India has reached up to about 27,312 (2017 Census).
 - **Karnataka had the highest number** of elephants (6,049), followed by Assam (5,719) and Kerala (3,054).

What is Project Elephant?

- **About:**
 - It is a [centrally sponsored scheme](#) and was launched in February 1992 for the **protection of elephants, their habitats and corridors**.
 - The Ministry of Environment, Forest and Climate Change provides financial and technical support to major elephant range states in the country through the project.
- **Objectives:**
 - To protect elephants, their habitat & corridors
 - To address issues of man-animal conflict
 - Welfare of captive elephants

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. With reference to Indian elephants, consider the following statements: (2020)

1. The leader of an elephant group is a female.
2. The maximum gestation period can be 22 months.
3. An elephant can normally go on calving till the age of 40 years only.
4. Among the States in India, the highest elephant population is in Kerala.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 4 only
- (c) 3 only
- (d) 1, 3 and 4 only

Ans: (a)

Exp:

- The elephant herd is led by the oldest and largest female member (known as the matriarch). This herd includes the daughters of the matriarch and their offspring. Hence, statement 1 is correct.
- Elephants have the longest-known gestational (pregnancy) period of all mammals, lasting up to 680 days (22 months). Hence, statement 2 is correct. Females between 14 - 45 years may give birth to calves approximately every four years with the mean interbirth intervals increasing to five years by age 52 and six years by age 60. Hence, statement 3 is not correct.
- As per Elephant Census (2017), Karnataka has the highest number of elephants (6,049), followed by Assam (5,719) and Kerala (3,054). Hence, statement 4 is not correct.
- **Therefore, option (a) is the correct answer.**

'Udarashakti' Exercise

Why in News?

Recently, a contingent of the [Indian Air Force](#) left for Malaysia to participate in a bilateral exercise named 'Udarashakti'.

- While **Harimau Shakti is Joint military exercises** which are held annually between the two countries.



What are the Highlights of the Exercise?

- **About:**
 - The Indian Air Force is **participating in the air exercise with [Su-30 MKI](#) and C-17 aircraft** while Malaysian Air Force will be flying **Su 30 MKM aircraft**.
 - The four days of exercise will witness the conduct of various aerial combat drills between the two Air Forces.
- **Background:**
 - The first bilateral Air Force exercise that **staged frontline Sukhoi-30 combat aircraft was conducted in 2018**.
 - From 2008 to 2010, the Indian Air Force Training Team was deployed in Malaysia to give training to Malaysian pilots on the SU-30SKM aircraft.

What is the Significance of the Exercise?

- Exercises will **strengthen long-standing friendships** and enhance defense cooperation between both armies. As a result, regional security will be strengthened.

- IAF will have an **opportunity to share and learn best practices** with the Royal Malaysian Air Force through this exercise. It is also likely that they will discuss mutual combat capabilities.

Source: PIB

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