

TARGET PRELIMS 2024

BOOKLET-41; EB&CC-10

INTERNATIONAL CONSERVATION EFFORTS

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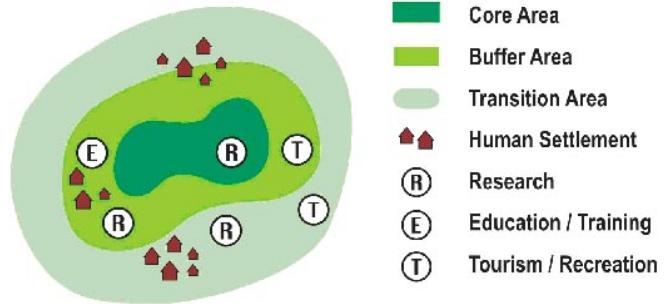
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2. UNESCO'S MAN AND BIOSPHERE PROGRAM (MAB)

- **Introduction**
 - » MAB Program is a **major effort in biodiversity conservation**, launched in 1971.
 - » It is an **inter-governmental scientific program** that aims to establish a scientific basis for improvement of relationships between people and their environments.
 - » MAB **combines natural and social sciences, economics and education** to improve human livelihood, and the equitable sharing of benefits.
- **Implementation of the MAB program**
 - » For implementation of its inter-disciplinary work on ground, MAB relies on the World Network of Biosphere Reserves (WNBR) and partnership for knowledge sharing, research and monitoring, education and training, and participatory decision making.
- **Characteristics of Biosphere Reserves**
 - » The characteristics feature of biosphere reserves are
 - **People are integral component**
 - **Remain under national jurisdiction** but share their experience and ideas nationally, regionally and internationally within the WNBR.
 - **Achieve three inter-connected functions:** Conservation, development and logistic support
 - **Zonation Scheme**
 - **Multi-stakeholder approach** with particular emphasis on the involvement of local communities in management.
 - **Integrating cultural and biological diversity**, especially the role of traditional knowledge in ecosystem management.
 - **Fostering dialogue** for conflict resolution in natural resource use.
- **Details about Zonation Scheme**
 - » While countries maintain flexibility at the national levels with regard to the definition of zones, the zonation needs to ensure that biosphere reserves effectively combine conservation, sustainable use of resources, and knowledge generation through integrated zonation and collaborative management.
 - » **Each biosphere reserve includes three zones: (Core, Buffer and Transition)**
 - i. **The Core Zone**

- Generally the strict nature reserves and wilderness portions are designated as core area in a BR.
- It should be kept absolutely undisturbed (or minimally disturbed).
- Non-destructive research and low impact uses (e.g. education) allowed.
- **Key functions of Core Area:**
 - **Conservation** function
 - **Range of ecosystem services:**
 - Employment opportunities can also complement conservation goals (e.g. environmental education, research, environmental rehabilitation and conservation measures, recreation and eco-tourism).

Structure of a model biosphere reserve.



ii. **The Buffer Zone** usually surrounds or adjoins the core area.

- It is used for cooperative activities compatible with sound ecological practices including, environmental education, recreation, ecotourism, and applied and basic research.
- They can also have important connectivity function in a larger spatial context as they connect biodiversity components within the core areas with those in transition areas.
- Human activities, if natural within BR, are likely to be permitted to continue if these don't affect the ecological diversity.

iii. **Transition Zone**

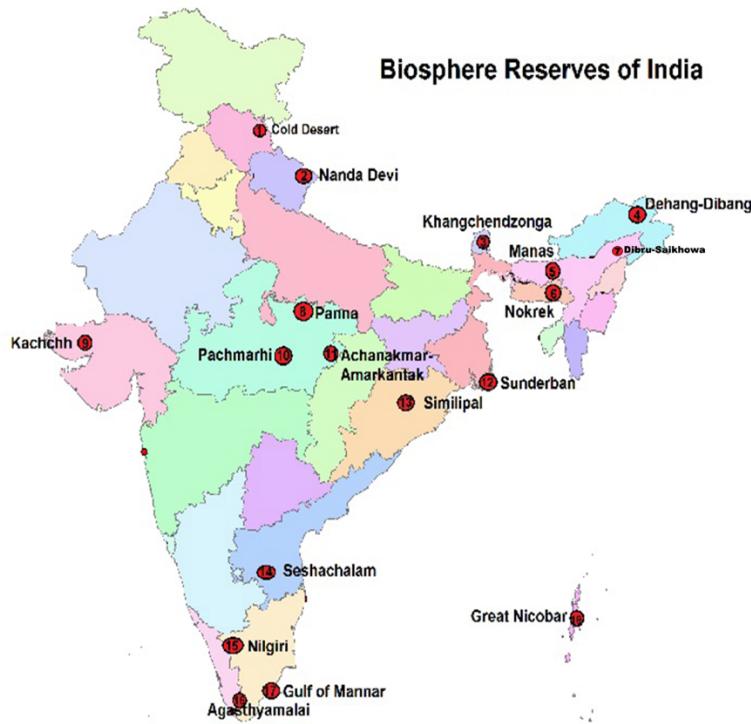
- Outermost part of biosphere reserve
- It has a central function in sustainable development which may contain a variety of agricultural activities, settlements, and other uses and in which local communities, management agencies, scientists and non-governmental organizations, cultural groups, economic interests, and other stakeholders work together to manage and sustainably develop the area's resource.
- Usually not delimited

- **Designation of Biosphere Reserves:** International Coordination Council (ICC) of the MAB program, UNESCO takes the final decision on the nomination for designation.
- **Relation between Biosphere Reserves and other protected areas (NP, WLS etc)**
 - BRs don't replace other PAs but it further strengthens the protected area network.
 - Existing PAs can become part of BR without any change in their legal status.
 - Inclusion of such PA in BR will enhance their national value
 - It doesn't mean the BR are to be established only around National Parks and WLS.
 - **Key differences**
 - » Conservation of overall biodiversity rather than a some specific flagship species.

- » **Increases broad-basing of stakeholders**, especially local people's participation and their training, compared to the features of scheme on WLS and NPs.
- » BRs are **internationally recognized** within the framework of UNESCO's MAB programme, after receiving consent from the participating countries.

- **Biosphere Reserves in India**

- The Indian government has established **18 biosphere reserves in India**, (categories roughly corresponding to IUCN Category 5 protected areas).
- A **scheme called Biosphere Reserve** is being implemented by GoI since 1986, in which financial assistance is given to states for maintenance, improvement and development of certain items. (60:40 general states, 90:10 - Northeastern and 3 Himalayan states)
- **The Indian National Man and Biosphere Committee** constituted by the Central govt identifies new sites, advises on policies and programmes, lays down guidelines, reviews progress and guidelines in the light of evaluation studies and feedback.
- **Management** of the biosphere reserves is the responsibility of concerned state/UT with necessary financing assistance, guidelines for management and technical expertise provided by the central government.
- **World Network of Biosphere reserves**
 - » **12** of the 18 biosphere reserves are a part of the World Network of Biosphere Reserves, based on the UNESCO Man and Biosphere (MAB) programme list.



Name	States	Key Fauna	Type	Year
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Great Nicobar Biosphere Reserves	Andaman and Nicobar Islands	Saltwater Crocodile	Islands	2013
Gulf of Mannar Biosphere Reserve	Tamil Nadu	Dugong or Sea cow	Coastal	2001
Agasthyamalai Biosphere Reserve	Kerala, Tamil Nadu	Nilgiri Tahr, Elephants	Western Ghats	2016
Nilgiri Biosphere Reserve	Tamil Nadu, Kerala, Karnataka	Nilgiri Tahr, Lion-tailed macaque	Western Ghats	2000
Simlipal Biosphere Reserve	Odisha	Gaur, Royal Bengal Tiger, Wild Elephant	Deccan Peninsula	2009
Achanakmar-Amarkantak Biosphere Reserve	Chhattisgarh, Madhya Pradesh	-	Maikala Hills	2012
Panna	Madhya Pradesh	Tiger, Chital, Chinkara, Sāmbhar, Sloth Bear	Ken River	2020
Panchmarhi Biosphere Reserve	Madhya Pradesh	Giant Squirrel, Flying Squirrel	Semi-Arid	2009
Sunderbans Biosphere Reserve	West Bengal	Royal Bengal Tiger	Gangetic Delta	2001
Nokrek Biosphere Reserve	Meghalaya	Red Panda	Tura Range, Meghalaya Plateau	2009
Khangchendzonga National Park	Sikkim		Himalayas	2018
Nanda Devi Biosphere Reserve	Uttarakhand	-	Western Himalayas	2004

- Other Biosphere reserves, not part of MAB include the following:

Name	States	Key Fauna	Type	Year
Seshachalam Hills	Andhra Pradesh (Eastern Ghats)		Eastern Ghats	2010
Little Rann of Kutch	Gujarat	Indian Wild Ass	Desert	2008
Manas	Assam	Golden Langur, Red Panda	Eastern Himalayas	1989
Dibru Saikhowa	Assam	Golden Langur	East Himalayas	1997
Dihang-Dibang	Arunachal Pradesh		Eastern Himalayas	1998

Cold Desert	Himachal Pradesh	Snow Leopard	Western Himalayas	2009
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1) PANNA BIOSPHERE RESERVE

- In 2020, UNESCO included Panna National Park/ TR in the list of UNESCO's World Network of Biosphere Reserves. Thus, Panna becomes the third biosphere reserve in MP after Panchmarhi and Amarkantak. MoEF&CC had declared Panna a Biosphere reserve in 2011 itself.
- **Details of Panna**
 - » It is a "Critical Tiger Habitat" in the state of Madhya Pradesh. It is also home to World Heritage Site of Khajuraho.
 - » It is characterized by forest and marshy vegetation, with an abundance of rare medicinal plants.
 - » **Ken river** flows through the reserve and the Ken-Betwa project will also be located in it.

CRITICAL TIGER HABITATS:

- Critical Tiger Habitat (CTH) refers to the areas within the tiger reserve that are considered to be the most important for the conservation of tigers.
- These areas are critical for:
 - i. Maintaining the breeding population and their prey species, as well as
 - ii. Providing connectivity to other habitats for long term survival of the tiger population.
- Certain areas under the Tiger Reserves are designated Critical Tiger Reserves under the Wildlife Protection Act, 1972. These areas are given highest level of protection under the law, and any development or human activity within these areas is strictly regulated to prevent any disturbance to the tiger population.
- The designation of Critical Tiger Habitats has played a significant role in conservation of tigers in India. As of March 2023, there are 54 tiger reserves in India, and each reserve has its own Critical Tiger Habitat area.

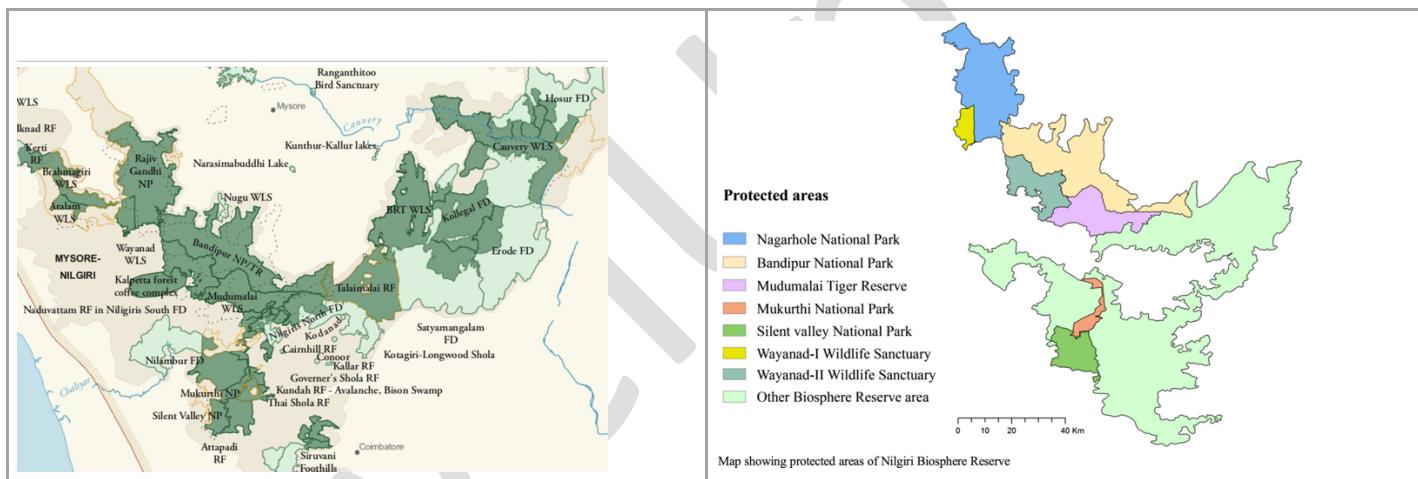
2) KANCHENJUNGA BIOSPHERE RESERVE

- **About Kanchenjunga Biosphere Reserve -**
 - » It is one of the highest ecosystems in the world. It falls within the Himalayan global biodiversity hotspots.
 - » **The core zone** alone has over 150 glaciers and 73 glacial lakes. **Zemu glacier** is one of the famous ones.
 - » 86% of the core lies in Alpine zone and the remaining portions are in the Himalayan Wet temperate and sub-tropical moist deciduous forest.
 - » It is also home to many threatened species including **musk deer, snow leopard, red panda, and Himalayan Tahr**.
 - » It is also home to many ethnic communities including **Lepcha, Nepalese, and Bhutia**.
- **Significance**
 - » The inclusion in the list will **boost the unique ecosystem of Sikkim** on two counts: Collaborative research and tourism.
 - It will boost the international research collaboration relating to flora and fauna and ecosystem of KBR.

- Further, this will help Sikkim get **more tourists**.

3) NILGIRI BIOSPHERE RESERVE

- The Nilgiri Biosphere Reserve was the first BR in India established in the year 1986. It is located in the Western Ghats and includes 2 of the 10 biogeographical provinces of India.
- Location and Area:** The reserve encompasses 5,520 km², in the state of Tamil Nadu (2537.6 Km²), Karnataka (1527.4 Km²) and Kerala (1455 km²). It forms an almost complete ring around the Nilgiri Plateau.
- Protected Area in Nilgiri BR include:**
 - Nagarhole NP**
 - Bandipur National Park**
 - Wayanad WLS**
 - Mudumalai WLS**
 - Sathyamangalam WLS**
 - Mukurthi NP**
 - Silent Valley NP**



- Vegetation type of Nilgiri BR**

Vegetational Types of the Nilgiri Biosphere Reserve

S.No	Forest type	Nature of Vegetation	Area of occurrence
1	Moist evergreen	Dense, moist and multi storeyed forest with gigantic trees	In the narrow valleys of Silent Valley
2	Semi evergreen	Moist, deciduous	Nilambur and Palghat division
3	Thorn	Dense	North east part of the Nilgiri district
4	Savannah woodland	Trees scattered amid woodland	Mudumalai and Bandipur
5	Sholas & grasslands	High elevated evergreen with grasslands	South and western catchment area, Mukurthi national park

- **The People:**

- » A variety of human cultural diversity can be found in the Nilgiri Biosphere Reserve.
- » Tribal groups like the Todas, Kotas, Irullas, Kurumbas, Paniyas, Adiyans, Edanadan Chettis, Cholanaickens, Allar, Malayan, etc., are native to the reserve. Except for Cholanaickens who live exclusively on food gathering, hunting and fishing, all the other tribal groups are involved in their traditional occupation of agriculture.

4) 3RD NOV: INTERNATIONAL DAY FOR BIOSPHERE RESERVE

- In the year 2022, at the 41st session of UNESCO's general conference, it was decided that Nov 3 would be celebrated worldwide as the International Day of Biosphere Reserve.
- This international day by UNESCO aims to:
 - i. Conserve nature, protecting biodiversity and cultural diversity.
 - ii. Promote scientific research, underpinning development through research monitoring, education and training.
 - iii. Promote socio-culturally and environmentally sustainable economic development.
 - iv. To foster the growth of local economies.

5) GLOBAL SITUATION OF BIOSPHERE RESERVES UNDER MAB NETWORK

- As of Nov 2023, there are 738 properties in 134 countries, including 12 in India, four in Sri Lanka and three in Maldives

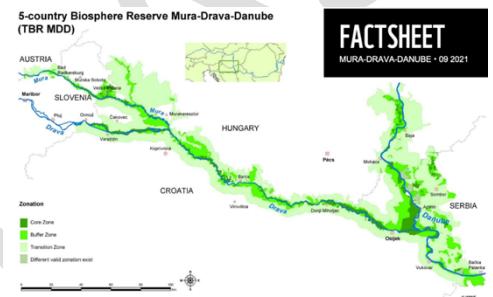
6) TRANSBOUNDARY BIOSPHERE RESERVES

- A TBR is first and foremost a cooperation between established Biosphere reserves. UNESCO formally designates it as a TBR if certain conditions are met:

- » A political agreement between the states concerned.
 - » A Common zoning that promotes the spatialization of conservation and development issues
 - » Identification of local and national partners and the establishment.
- TBR is an international recognition of a political will to cooperate in the conservation and sustainable use, through common management, of a shared ecosystem.

7) IN 2021 UNESCO DECLARED WORLD'S FIRST 5 COUNTRY BIOSPHERE RESERVE IN AMAZON OF EUROPE

- In Sep 2021, UNESCO designated **Mura-Drava-Danube** (MDD) as the world's first 'five country biosphere reserve'.
- **Unique Features:**
 - » It is Central Europe's largest near natural free-flowing river system without any dams across five countries.
 - » It is the first biosphere reserve in the world which is commonly shared and managed by five countries.
 - » With, 930,000 ha along 700 km of Mura, Drava and Danube Rivers Europe's largest river protected area.
 - » Flagship project for international understanding and regional cooperation.
- The reserve covers 700 kms of the Mura, Drava and Danube rivers and stretches across **Austria, Slovenia, Croatia, Hungary, and Serbia**.
- It is home to floodplain forests, gravel, and sand banks, river islands, oxbows, and meadows.
- It is home to continental Europe's highest density of breeding white-tailed eagle (more than 150 pairs), as well as endangered species such as the little tern, black stork, otters, beavers, and sturgeons.
- It is also an important annual resting and feeding place for more than 250,000 migratory birds, according to WWF. Almost, 900,000 people live in the biosphere reserve.
- The total area of the reserve - a million hectares - in the so called 'Amazon of Europe', makes it the largest riverine protected area on the continent.
- The new reserve represented an important contribution to the European Green Deal and contributes to the implementation of the EU Biodiversity Strategy in the Mura-Drava-Danube region.
 - » The strategy aims to revitalize 25,000 km of rivers and protect 30% of the EU's land area by 2030.



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3. UNESCO WORLD HERITAGE CONVENTION

- In 1972, UNESCO adopted the Convention Concerning the Protection of the World Cultural and Natural Heritage.
 - » This convention seeks to encourage the identification, protection, and preservation of cultural and natural heritage around the world, considered to be of outstanding value to humanity.
- **Strategic Objectives** (the "Five Cs")
 - » Credibility
 - » Conservation
 - » Capacity Building
 - » Communication
 - » Communities
- **What does the convention contain?**
 - » The Convention sets out the duties of state parties in identifying potential sites and their role in protecting and preserving them.
 - By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage.
 - » It explains how the World Heritage Fund is to be used and managed and under what conditions international financial assistance may be provided.
 - » The Convention obligates States Parties to report regularly to the World Heritage Committee on the state of conservation of their World Heritage properties.
 - » It also encourages States Parties to strengthen the appreciation of the public for World Heritage properties and to enhance their protection through educational and information programmes.
- **World Heritage Site**
 - » A world heritage site is a landmark which has been officially recognized by the UN, specifically by UNESCO.
 - » Sites are selected on the basis of cultural, historical, scientific or some other form of significance and they are legally protected by international treaties. UNESCO regards these sites as being important to the collective interests of humanity.
 - » The list is maintained by the International World Heritage Program administered by the UNESCO World Heritage Committee, composed of 21 UNESCO member states which are elected by General Assembly.
 - » While each World Heritage site remains part of legal territory of state wherein the site is located, UNESCO considers it in the interest of the International Community to preserve each site.
- **How UNESCO grants World Heritage Site tag?**
 - » Step 1: Inclusion in tentative list

- A tentative list is an "inventory" of properties a country believes deserves to be a World Heritage Site.

» **Step 2: Nomination File**

- After UNESCO includes a property in the Tentative List, the country has to prepare a nomination document.
- The Nomination file is evaluated by the International Council for Monuments and Sites and the World Conservation Union. These bodies then make recommendations to the World Heritage Committee.

» **Step 3: Consideration by UNESCO World Heritage Committee**

- The country meets once a year to determine whether or not to inscribe each nominated property on the World Heritage List and sometimes defer the decision to request more information from the country which nominated the sites.
- There are 10 selection criteria - a site must meet at least one.

- **10 Criteria**

- » Up to 2004 there were six criteria for cultural heritage site and four criteria for the natural heritage site.
- » In 2005 this was modified so that, now only one set of ten criteria.
- » Nominated sites must be of "outstanding universal value" and meet atleast one of the ten criteria.

1) WORLD HERITAGE SITES IN INDIA

As of Jan 2024, India has 42 World Heritage sites (34 Cultural, 7 Natural and 1 Mixed)

Cultural Heritage Sites in India	Year of Entry	State
#1 Agra Fort	1983	Uttar Pradesh
#2 Ajanta Caves	1983	Maharashtra
#3 Ellora Caves	1983	Maharashtra
#4 Taj Mahal	1983	Uttar Pradesh
#5 Group of Monuments at Mahabalipuram	1984	Tamil Nadu
#6 Sun Temple, Konark	1984	Odisha
#7 Churches and Convents of Goa	1984	Goa
#8 Fatehpur Sikri	1986	Uttar Pradesh
#9 Group of Monuments at Hampi	1986	Karnataka
#10 Khajuraho Group of Monuments	1986	Madhya Pradesh
#11 Elephanta Caves	1987	Maharashtra
#12 Great Living Chola Temples	1987	Tamil Nadu

#13 Group of Monuments at Pattadakal	1987	Karnataka
#14 Buddhist Monuments at Sanchi	1989	Madhya Pradesh
#15 Mountain Railways of India	1999	West Bengal, Tamil Nadu, Himachal Pradesh
#16 Humayun's Tomb, Delhi	1993	Delhi
#17 Qutub Minar and Monuments, Delhi	1993	Delhi
#18 Mahabodhi Temple Complex at Bodh Gaya	2002	Bihar
#19 Rock Shelters of Bhimbetka	2003	Madhya Pradesh
#20 Champaner-Pavagadh Archaeological Park	2004	Gujarat
#21 Chhatrapati Shivaji Terminus (formerly Victoria Terminus)	2004	Maharashtra
#22 Red Fort Complex	2007	Delhi
#23 Jantar Mantar	2010	Jaipur
#24 Hill Forts of Rajasthan	2013	Rajasthan
#25 Rani Ki Vav (The Queen's Stepwell)	2014	Gujarat
#26 Archaeological Site of Nalanda Mahavira at Nalanda	2016	Bihar
#27 The Architectural Work of Le Corbusier, an Outstanding Contribution to the Modern Movement	2016	Chandigarh
#28 Historic City of Ahmedabad	2017	Gujarat
#29 Victorian Gothic and Art Deco Ensembles of Mumbai	2018	Maharashtra
#30 Jaipur City	2019	Rajasthan
#31 Kakatiya Rudreshwara (Ramappa) Temple	2021	Telangana
#32 Dholavira, a Harappan City	2021	Gujarat
#33 Santiniketan	2023	West Bengal
#34 Sacred Ensembles of the Hoysala	2023	Karnataka

Natural Heritage Site in India	Year of Entry	State
#1 Sundarbans National Park	1987	West Bengal

#2 Western Ghats	2012	Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra, and Gujarat
#3 Nanda Devi and Valley of Flowers National Parks	1988	Uttarakhand
#4 Manas Wildlife Sanctuary	1985	Assam
#5 Great Himalayan National Park	2014	Himachal Pradesh
#6 Keoladeo National Park	1985	Rajasthan
#7 Kaziranga National Park	1985	Assam

Mixed Heritage Site in India	Year of Entry	State
#1 Khangchendzonga National Park	2016	Sikkim

2) ADVANTAGE OF GETTING WORLD HERITAGE TAG

- **Identity:** the recognized site gets a new identity world over. The status itself confirms that the outstanding and exceptional features of the listed site.
- **Funding:** the site gets fund from World Heritage Fund for its protection
- **Tourism:** International recognition attracts attention of both domestic and global tourists.
- **Protection during Wartime:** The site becomes protected under Geneva convention against destruction or misuse during war.
- **National governments also become more responsible** in the protection of the site.
- **Access to global project management resources**, as they are now more willing to participate with the project.

“MARATHA MILITARY LANDSCAPES OF INDIA” WILL BE INDIA’S NOMINATION FOR RECOGNITION AS UNESCO WORLD HERITAGE LIST FOR THE YEAR 2024-25 (JAN 2024)

- It was developed between 17th and 19th centuries, and represent an extraordinary fortification and military system envisioned by the Maratha rulers
- The **twelve component parts of this nomination** are, Salher Fort, Shivneri Fort, Lohgad, Khanderi fort, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala fort, Vijay durg, Sindhudurg in Maharashtra and Gingee Fort in Tamil Nadu.
- The Maratha Military Landscapes of India is nominated under **criterion (iii): To bear a unique or at least exceptional testimony to a cultural tradition or to a civilization that in living or which has disappeared**, **criterion (iv): to be an outstanding example of a type of building, architectural or technological ensemble, or landscape that illustrates significant stage(s) in human history** and **Criterion**

(vi): To be directly or tangibly associated with events or living traditions, with ideas or with beliefs, with artistic and literary works of outstanding universal significance.

UNESCO INSCRIBES KARNATAKA'S SACRED ENSEMBLE OF HOYSALAS IN WORLD HERITAGE LIST (SEP 2023)

- The ancient site was part of UNESCO's tentative list since 2014 and now the global body has decided to inscribe **Sacred Ensembles of the Hoysalas in the World Heritage List**.
 - » The serial property encompasses the **three most representative examples of Hoysalas-style temple complexes in Southern India** dating from 12th to 13th century.
 - » The Hoysala style was created through a careful selection of **contemporary temple features** and those from the past to create a different identity from neighbouring kingdoms.
 - The shrines are characterized by hyper real sculptures and stone carving that cover the entire architectural surface, a circumambulatory platform, a large-scale sculpture gallery, a multi-tiered frieze, and Sculpture of the Sala legend.
 - » Chennakesava Temple was constructed by King Vishnuvardhana of the Hoysala dynasty in the 12th century to commemorate his victory over Cholas.
 - Other temples which are part of the Sacred Ensemble of Hoysala at Belur are Kappe Chennigaraya temple, Veeranarayan Temple, and Ranganayaki Temple which are relatively smaller in size than Chennakesava Temple but are famous for their architectural marvel.
 - » **Sacred Ensembles of Hoysala at Halebid:**
 - Intricate carving, finely detailed sculptures, and star shaped architectural plans are the prime features of sacred ensembles of Hoysala at Halebid.
 - The main Hoysaleswara temple was built in the 12th century during the reign of the King Vishnuvardhana and is dedicated to Lord Shiva.
 - Kedareshwara temple showcases remarkable Hoysala architecture and stone carvings.

SANTINIKETAN: NEW INDIAN SITE IN THE UNESCO'S WORLD HERITAGE LIST (SEP 2023)

- Santiniketan, West Bengal has been inscribed on the UNESCO's list of World Heritage sites during the ongoing 45th session of the UNESCO World Heritage Committee in Riyadh, Kingdom of Saudi Arabia.
 - » It is **India's 41st UNESCO World Heritage site**.
 - Established in Rural West Bengal in 1901, Santiniketan was founded by Rabindranath Tagore, a renowned poet and philosopher.
 - It is an ensemble of historic buildings, landscapes, and gardens, pavilions, artworks, and continuing educational and cultural traditions that together express its outstanding Universal value.
 - The built and open spaces of Santiniketan constitute an exceptional global testimony to ideas of environmental art and educational reform where progressive education and visual art intertwined with architecture and landscape, with the Ashram, Uttarayan, and Kala Bhavan areas forming the prime sites of these practices.

4. CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

- **Introduction :**
 - The CBD is a multilateral treaty which was approved in 1992 at the Earth Summit in Rio and came into force on 29 Dec, 1993.
 - » NOTE: Other two convention finalized at Rio summit included UNFCCC and UNCCD.
 - It has **3 main objectives:**
 - » The conservation of Biodiversity.
 - » The sustainable use of the component of biodiversity.
 - » The fair and equitable sharing of benefits arising out of the utilization of genetic resources.
 - **Membership**
 - » As of Feb **2022**, 196 countries were parties to convention.
 - India ratified CBD in 1994.
 - USA - signed the convention in 1993, but has not ratified it.
- **Key provisions**
 - » The Convention requires governments to undertake to conserve and sustainably use biodiversity. They are required to **develop national biodiversity strategies and action plans** and to integrate these into broader national laws for environment and development
 - » **Key treaty commitments include**
 1. Identifying and monitoring important components of biological diversity.
 2. Establishing protected areas to conserve biodiversity while promoting environmentally sound development around the area.
 3. **Rehabilitating degraded ecosystems** and promoting recovery of threatened species in collaboration with local residents
 4. Respecting, preserving and maintaining traditional knowledge of the sustainable use of biodiversity with the involvement of indigenous people and local communities.
 5. **Preventing** introduction of, controlling and eradicating alien species that could threaten ecosystems, habitats or species.
 6. Controlling the risks posed by GM Organisms.
 7. Promoting **public participation**, educating people and raising awareness regarding the significance of biodiversity.
 8. **Reporting** on how countries are meeting biodiversity goals.



1) CARTAGENA PROTOCOL ON BIOSAFETY TO THE CONVENTION ON BIOLOGICAL DIVERSITY

- **Introduction**

- It is an international agreement which aims to ensure the **safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology** that may have adverse effects on biological diversity, taking also into account risks to human health.
- The protocol makes it clear that **products from new technologies** must be based on the **precautionary principle** and allow developing nations to balance public health against economic benefits.
- It was the **first international regulatory framework** on safer transfer, handling and use of LMOs.
- It was adopted in 2000 and entered into force on 11th Sep 2003.
- The protocol **promotes biosafety by establishing rules and procedures** for the safe transfer, handling, and use of LMOs.

- **Advanced Information Agreement**

- The Cartagena Protocol provides for **Advanced information agreement (AIA)** procedure for ensuring that countries are provided with the information necessary to make decisions before agreeing to the import of such organisms into their territory.
- **Biosafety Clearing House** is established by the protocol to facilitate the exchange of information on LMOs and to assist countries in the implementation of the Protocol.

2) NAGOYA-KUALA LUMPUR SUPPLEMENTARY PROTOCOL ON LIABILITY AND REDRESS TO THE CARTAGENA PROTOCOL ON BIOSAFETY

- Liability and redress in the context of Cartagena Protocol concerns the question of what would happen if the trans-boundary movement of LMO has caused damage.
- It provides international rules and procedures on liability and redress for damage to biodiversity resulting from LMOs.
- India ratified in 2014

3) NAGOYA PROTOCOL TO CBD

- **What is Nagoya Protocol and what is its objective?**

- The Nagoya Protocol on **Access to Genetic Resources and the Fair and Equitable Sharing of Benefits** Arising from their utilization (ABS) to the CBD is a supplementary agreement to the CBD.
- It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources.
- The Nagoya Protocol on ABS was adopted on 29 October 2010 in Nagoya, Japan and entered into force on 12 October 2014

- **Significance of Nagoya Protocol**

- Creates greater legal certainty and transparency for both providers and users of genetic resources by:
 - » Establishing more predictable conditions for access to genetic resources

- » Helping to ensure benefit sharing when genetic resource leave the country providing the genetic resources.
- **What is covered by NP?**
 - Genetic resources that are covered by CBD and benefits arising from their utilization.
 - » It also covers traditional knowledge (TK) associated with genetic resources that are covered by CBD and the benefits arising from its utilization.
- **Core Obligations of Nagoya Protocol wrt Genetic Resources**
 - **Access Obligation**
 - » Parties have to take domestic level access measures
 - **Benefit Sharing Obligation**
 - » Domestic level benefit sharing measures are to provide for the fair and equitable sharing of benefits arising from the utilization of genetic resources with the contracting party providing genetic resources
 - **Compliance Obligation**
 - » Specific obligations to support compliance with the domestic legislation or regulatory requirements of contracting party providing genetic resources , compliance with mutually agreed terms
- **What is the Access and Benefit-sharing Clearing House?**
 - The ABS clearing house is a platform for exchanging information on access and benefit sharing established by Article 14 of the Protocol, as part of the clearing house of the Convention.
 - It is one of the key tool in facilitating implementation of the Nagoya Protocol, by enhancing legal certainty and transparency on procedures for access and benefit-sharing and for monitoring the utilization of genetic resources along the value chain, including through internationally recognized certificates of compliance

4) CBD-COP15: KUNMING-MONTREAL BIODIVERSITY FRAMEWORK (DEC 2022)

- After multiple delays due to COVID-19, nearly 200 countries at the UN Biodiversity Conference (COP15) in Montreal sealed a landmark deal - ***The Kunming-Montreal Global Biodiversity Framework (GBF)***, with four goals and 23 action oriented targets.
- **Some Facts about COP15:**
 - COP15 was held in Montreal, Canada. It was chaired by China and hosted by Canada.
 - It resulted in the adoption of ***The Kunming-Montreal Global Biodiversity Framework (GBF)*** which replaces the Aichi Biodiversity targets set in 2010.
- **Key Features:**
 - **Four Goals and 23 action-oriented targets** were adopted.
 - **Four Goals:**

GOAL A

- The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050;
- Human induced extinction of known threatened species is halted, and, by 2050, extinction rate and risk of all species are reduced tenfold, and the abundance of native wild species is increased to healthy and resilient levels;
- The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.

GOAL B

- **Biodiversity is sustainably used and managed** and nature's contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development, for the benefit of present and future generations by 2050.

GOAL C

- **The monetary and non-monetary benefits from the utilization of genetic resources**, and digital sequence information on genetic resources, and of traditional knowledge associated with genetic resources, as applicable, are shared fairly and equitably, including, as appropriate with indigenous peoples and local communities, and substantially increased by 2050, while ensuring traditional knowledge associated with genetic resources is appropriately protected, thereby contributing to the conservation and sustainable use of biodiversity, in accordance with internationally agreed access and benefit-sharing instruments.

GOAL D

- Adequate means of implementation, including financial resources, capacity-building, technical and scientific cooperation, and access to and transfer of technology to fully implement the Kunming-Montreal global biodiversity framework are secured and equitably accessible to all Parties, especially developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, progressively closing the biodiversity finance gap of \$700 billion per year, and aligning financial flows with the Kunming-Montreal Global Biodiversity Framework and the 2050 Vision for Biodiversity.

▪ **23 Targets:**

- **TARGET 1:** Bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.
- **TARGET 2:** Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration,
- **TARGET 3** (commonly called **30X30**): Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures.
 - **Note:** Currently, 17% of terrestrial and 10% of marine areas are protected.

- **Note:** Countries are not individually required to attain the 30X30 target.
-
- **TARGET 4:** Ensure urgent management actions, to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species,
- **TARGET 5:** Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal,
- **TARGET 6:** Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services; reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 percent, by 2030, eradicating or controlling invasive alien species especially in priority sites, such as islands.
- **TARGET 7:** Reduce pollution risks and the negative impact of pollution from all sources, by 2030, to levels that are not harmful to biodiversity and ecosystem functions and services, considering cumulative effects.
- **TARGET 8:** Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions,
- **TARGET 9:** Ensure that the management and use of wild species are sustainable, thereby providing social, economic and environmental benefits for people, especially those in vulnerable situations and those most dependent on biodiversity,
- **TARGET 10:** Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably,
- **TARGET 11:** Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services,
- **TARGET 12:** Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably
- **TARGET 13:** Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030 facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.
- **TARGET 14:** Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors, in particular those with significant impacts on biodiversity, progressively aligning all relevant public and private activities, fiscal and financial flows with the goals and targets of this framework.
- **TARGET 15:** Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions:
 - (a) Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity including with requirements for all large as well as transnational companies and financial institutions along their operations, supply and value chains and portfolios;

- (b) Provide information needed to consumers to promote sustainable consumption patterns;
- (c) Report on compliance with access and benefit-sharing regulations and measures, as applicable;
- in order to progressively reduce negative impacts on biodiversity, increase positive impacts, reduce biodiversity-related risks to business and financial institutions, and promote actions to ensure sustainable patterns of production.
- **TARGET 16:** Ensure that people are encouraged and enabled to make sustainable consumption choices including by establishing supportive policy, legislative or regulatory frameworks, improving education and access to relevant and accurate information and alternatives, and **by 2030, reduce the global footprint of consumption in an equitable manner, halve global food waste.**
 - **TARGET 17:** Establish, strengthen capacity for, and implement in all countries in biosafety measures as set out in Article 8(g) of the Convention on Biological Diversity and measures for the handling of biotechnology and distribution of its benefits as set out in Article 19 of the Convention.
 - **TARGET 18:** Identify by 2025, and eliminate, phase out or reform incentives, including subsidies harmful for biodiversity, in a proportionate, just, fair, effective, and equitable way, while substantially and progressively reducing them by at least 500 billion US\$ per year by 2030, starting with the most harmful incentives, and scale up positive incentives for the conservation and sustainable use of biodiversity.
 - **TARGET 19:** Substantially and progressively increase the level of financial resources from all sources, in an effective, timely and easily accessible manner, including domestic, international, public and private resources, in accordance with Article 20 of the Convention, to implement national biodiversity strategies and action plans, by 2030 mobilizing at least 200 billion United States dollars per year.
 - **Financial Package to poor countries:** The agreement asks for increasing to at least \$20 billion annually by 2025 the money that goes to poor countries. That number would be increased to \$30 billion each year by 2030.
 - **TARGET 20:** Strengthen capacity-building and development, access to and transfer of technology, and promote development of and access to innovation and technical and scientific cooperation, including through South-South, North-South and triangular cooperation,
 - **TARGET 21:** Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public
 - **TARGET 22:** Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources, and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities and ensure the full protection of environmental human rights defenders.
 - **TARGET 23:** Ensure gender equality in the implementation of the framework

5) COMMEMORATIVE PERIODS

A) 2010: INTERNATIONAL YEAR OF BIODIVERSITY

B) 2011-2020: UN DECADE OF BIODIVERSITY

- This was announced on recommendation of the CBD signatories during COP10 at Nagoya in October, 2010.

C) INTERNATIONAL DAY FOR BIOLOGICAL DIVERSITY: 22ND MAY

- The UN has proclaimed May 22 as the International Day for Biological Diversity (IDB) to increase understanding and awareness of biodiversity issues.
- This day was chosen as **Convention on Biological Diversity was adopted by UN Conference** on this day.

6) REPORT: GLOBAL BIODIVERSITY OUTLOOK

- The report provides a summary of the status of biological diversity and an analysis of the steps being taken by the global community to ensure that biodiversity is conserved and used sustainably, and that benefits arising from the use of genetic resources are shared equitably.
- **The fifth edition (GBO-5)** is the final report card on progress against 20 global biodiversity targets agreed in 2010 with a 2020 deadline, and offers lessons learned and best practices for getting on track.
- None of the 20 targets have been fully achieved, though six targets have been partially achieved (Targets 9, 11, 16, 17, 19 and 20)

5. POLLINATORS AND ASSOCIATED ISSUES

- There are more than 20,000 species of wild bees alone, plus many species of butterflies, flies, moths, wasps, beetles, birds, bats, and other animals that contribute to pollination. Pollinated crops include those that provide fruit, vegetables, seeds, nuts, and oils. Many of these are important dietary sources of vitamins and minerals, without which the risks of malnutrition might be expected to increase. Several crops also represent an important source of income in developing countries from, for example, the production of coffee and cocoa

1) IPBES GLOBAL ASSESSMENT OF POLLINATORS

- This assessment, titled **Thematic Assessment of Pollinators, Pollination and Food Production** is the first ever assessment of pollinators issued by IPBES.
- **Key Highlights**
 - **Significance of Pollinators:**
 - » **75% of world's food crops** depend at least in part on pollination.
 - » **90% of the wild flowering plants** depend on pollinators
 - » **Volume of agri-production dependent on pollinators** has increased by 300% during the past 50 years.
 - **A number of pollinator species worldwide** are being driven towards **extinction**. This is threatening millions of livelihoods and 100s of billions of dollars' worth of food supply.
 - **Key factors affecting pollinators**
 - » Changes in land use
 - » Intensive agri production
 - » Pesticides (including neonicotinoid insecticides)
 - » Alien invasive species
 - » Diseases and pests are specially problematic for managed bees.
 - » Climate change
 - **Way forward** - Sustainable Agriculture, reducing chemical pesticides, Improved managed bee husbandry

2) ABOUT INTERGOVERNMENTAL SCIENCE POLICY PLATFORM ON BIODIVERSITY AND ECOSYSTEM SERVICES (IPBES)

- It is an **independent inter-governmental body** established by states to strengthen the science policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long term human well-being, and sustainable development.
- It was **established in 2012** at Panama city.
- It is **not an UN body**. However, at the request of the IPBES plenary and authorization of UNEP Governing Council, the **UNEP provides secretariat services to IPBES**.
- It currently has 134 member states. Many NGOs, organizations, conventions and civil society groupings also participate in the formal IPBES process as observers, with several thousand individual stakeholders,

ranging from scientific experts to representatives of academic and research institutions, local communities and the private sector, contributing to and benefiting from our work

- **The work of IPBES can be categorized in four complementary areas:**

1. **Assessments:** e.g., the Assessment of Pollinators
2. **Policy Support:** Identifying policy-relevant tools and methodologies, facilitating their use, and catalysing their further development.
3. **Building Capacity and Knowledge**
4. **Communication and Outreach**

3) ABOUT "THE GLOBAL COALITION OF THE WILLING ON POLLINATORS)

- The coalition was formed in 2016 to follow up on the findings of IPBES Assessment on Pollinators, Pollination and Food Production.
- The coalition has 28 signatories including 17 European countries, five from Latin America and the Caribbean and four from Africa.
- **Members are supposed to do the following:**
 - Taking action to protect pollinators and their habitats by developing and implementing national pollinator strategies
 - Sharing experience and lessons learnt in developing and implementing national pollinator strategies, especially knowledge on new approaches, innovations, and best practices
 - Reaching out to seek collaboration with a broad spectrum of stakeholders—countries as well as businesses, NGOs, farmers, and local communities
 - Developing research on pollinator conservation

4) WORLD BEE DAY: 20TH MAY

- The World observes Bee Day on May 20 to raise awareness about the importance of pollinators and how they contribute to our sustainable developments. The day has been designated by the UN.

6. CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES (CITES) ON WILD FLORA AND FAUNA

- **About Convention**

- » Convention also known as **Washington convention** is a multilateral treaty to protect endangered plants and animals.
- » It was drafted as a result of resolution adopted in 1963 at a meeting of members of the IUCN (International Union for Conservation of Nature).
- » It came into force in 1975 and now has **184 parties** (as of Nov 2022). Almost every country in the world has signed up + the European Union.

- The convention is **binding on Parties** in the sense that they are committed to implementing it; however, it doesn't take the place of national laws.
- **Aim:** It's aim is to ensure that **international trade** in specimens of wild animals and plants **does not threaten the survival of the species in wild**, and it accords varying degree of protection to more than 35,000 (>5000 plants, and > 30 thousand animals) species of plants and animals.
 - » In essence, **CITES ban hunting, capturing, and selling of endangered or threatened species.**
- **Categorization of Species covered by CITES according to degree of protection they need:**
 - » **Appendix I:**
 - The appendix includes those species which are **threatened with extinction** and where trade is a current or potential threat to their continued existence.
 - **Any international movement of these species** - or products made from them - **requires permits from both the exporting and importing country.**
 - **International trade for commercial purpose** is **generally not allowed** and is permitted **only in exceptional circumstances.**
 - The appendix currently has **over 1,000 species.**
 - » **Appendix II:**
 - Species included in this appendix are **not necessarily threatened with extinction**, but their **trade must be controlled** in order to avoid utilization incompatible with their **survival.**
 - **In practice**, the appendix includes many highly endangered species.
 - This is the **biggest appendix** and has around 40,000 species.
 - **International Trade** in the species is allowed but **requires a permission from exporting countries**, after determining that the export will not harm the survival of the species and that the specimen has been **obtained legally.**
 - » **Appendix III:**
 - This appendix is used when a country wants to regulate trade in a given species. Here, a **country can get a species listed unilaterally.**
 - **Export permits are then required** for that species be exported from the country.
 - **Note:** Additions to Appendix 1 and Appendix 2, **require the agreement of two-third of the COP.**
- **Significance**
 - » Even though **enforcement is difficult**, CITES has helped reduce trade in many threatened species including elephants, crocodiles, and chimpanzees.

A) COP OF CITES

- » CoP of CITES meet **every three years**. The **18th CITES was held in Geneva in 2019** and the **COP-19 was held in Panama in Nov 2022.**

7. CONVENTION ON CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (BONN CONVENTION – CMS)

- **Introduction:**
 - **Migratory species** are those animals that move from one habitat to another during different times of the year, due to various factors such as food, sunlight, temperature, climate, etc. The movement between habitats, can sometimes exceed thousands of miles/kilometres for some migratory birds and mammals. A migratory route can involve nesting and requires the availability of habitats before and after each migration.
 - To protect the migratory species throughout their range countries, a **Convention on Conservation of Migratory Species (CMS)**, has been in force, under the aegis of United Nations Environment Programme.
 - » Also referred to as the **Bonn Convention**, it provides a global platform for the conservation and sustainable use of migratory animals and their habitats and brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range.
 - It is only global convention specializing in the conservation of migratory species, their habitat and migration routes.
- **Appendix I and Appendix 2**
 - **Migratory species threatened with extinction** are listed on **Appendix I** of the Convention.
 - » CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them.
 - » Besides establishing obligations for each State joining the Convention, CMS promotes concerted action among the Range States of many of these species.
 - Migratory species that need or would significantly benefit from international co-operation are listed in **Appendix II** of the Convention.
 - » For this reason, the Convention encourages the Range States to conclude global or regional agreements.
- **Members**
 - Currently there are 132 members to the convention.
 - **India** has been party to the CMS since **1983**.
- **COP** is the decision making body of CMS.
- **Key Highlights: 13th COP Summit, Gandhinagar Gujarat**
 - i. **Gandhinagar Declaration** sends strong message on importance of migratory species for new global biodiversity strategy.

- iii. **The First Ever Report on the Status of Migratory Species**, presented to CMS COP13, shows that despite some success stories, the **populations of most migratory species covered by CMS are declining.**
 - iv. **Great Indian Bustard, Asian Elephant, and Bengal Florican** have been classified as "Endangered Migratory Species" (Appendix 1) by CMS as per Indian proposal.
 - v. **Animal Culture Linked to Conservation for the first time at UN Wildlife Conference in India**
 - vi. **Seven Migratory Species Champions** were recognized during the conference.
 - Under the Champion program, Germany, India, Italy, Monaco, Norway, the European Commission, and the Environmental Agency - Abu Dhabi were acknowledged for their **generous contributions to the CMS initiatives.**
- **India also has non-legally binding MoUs with CMS** on the conservation and management of **Siberian Crane** (1998), **Marine Turtles** (2007), **Dugongs** (2008) and **Raptors** (2016).
 - India is temporary home to **several migratory animals and birds**. The important among these include Amur Falcons, Bar headed Geese, Black necked cranes, Marine turtles, Dugongs, Humpbacked Whales, etc.

8. TRAFFIC

- **TRAFFIC** is a wildlife **trade monitoring network**. Its **mission** is to ensure that **trade in wild plant and animals is not a threat to the conservation of nature**. It plays a pivotal role in **tackling illegal wildlife trade** through research and analysis, advocacy, and awareness work and by supporting remedial action against illegal wildlife trade.
 - It **specializes** in **investigating and analyzing wildlife trade trends, impacts and drivers; informing and supporting governments** to enforce effective policies and laws; **advising private sector** on mechanism for sustainable sourcing of wildlife etc.
- It was established **in 1976 as a strategic alliance of IUCN and WWF.**
- **TRAFFIC and CITES**
 - **One of the TRAFFIC priorities** is to **promote international cooperation to address wildlife trade issues, with particular emphasis on CITES.**
 - It provides **information and assistance** to help the **decision making process of CITES**, supporting efforts to ensure that international wildlife trade is at sustainable levels and doesn't pose a threat to the conservation of species.
 - In 1999, **CITES and TRAFFIC** signed an MoU to undertake **joint activities for capacity building.**

9. BIRDLIFE INTERNATIONAL

- It is a **global partnership of conservation organizations (NGOs)** which work towards **conservation of birds, their habitats, and global biodiversity.**
 - Its priorities include **preventing extinction of bird species, identifying, and safeguarding important sites of birds**, maintaining, and restoring key bird habitats, and empowering conservationists worldwide.
- It is the **world's largest partnership** of conservation organizations, with over **121 NGO partner organizations.**
 - For e.g., in India, the partner organization is **Bombay Natural History Society (BNHS)**

- Birdlife International has so far identified more than 7,500 important bird areas.

10. IMPORTANT BIRD AND BIODIVERSITY AREAS (IBAS)

- Introduction

- An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird population. The program was developed and sites are identified by Bird Life International.
- Since the late 1970s, the **Bird Life Partnership** has been working collectively to identify, document and protect all places on earth of greatest significance for the conservation of the world's birds.
- As a result, over 13,000 Important Bird and Biodiversity Areas (IBAs) have been identified. All of these sites are also (Key Biodiversity Areas) KBAs for birds at the global or regional level.

- Significance

- IBA recognition enhance the conservation attention of the bird species of the region.
- Some of the region also get statutory protection.

- Criteria to be identified as IBAs

i. Globally Threatened Species

- The site qualifies if it is known, estimated, or thought to hold a population of a species categorized by the IUCN Red List as Critically Endangered, or Endangered or Vulnerable.
 - Presence of CR or EN -> sufficient for qualification
 - Presence of Vul -> presence of more than a threshold is necessary to trigger selection.

ii. Restricted Range Species

- The sites form one of a set selected to ensure that all restricted-range species of an Endemic Bird Area (EBA) or a Secondary Bird Area (SA) are present in significant numbers in at least one site and preferably more.

iii. Biome Restricted Species

iv. Congregations

- How do Birdlife International work to protect these habitats?

- Each of the **Birdlife Partners** has responsibility for their national network of Important Bird & Biodiversity Areas (IBAs).
- The Birdlife Secretariat takes the lead on all international aspects as well as in some priority countries where BirdLife is not present and in the High Seas

- Other Important sub-programs

▫ IBAs in Danger

- These are IBAs under threat from damaging development - the majority of which appears to be poorly planned and doesn't take environmental values into account.
- The IBAs in Danger initiative provides an essential focus for governments, development agencies, the international environmental and conservation conventions, business and

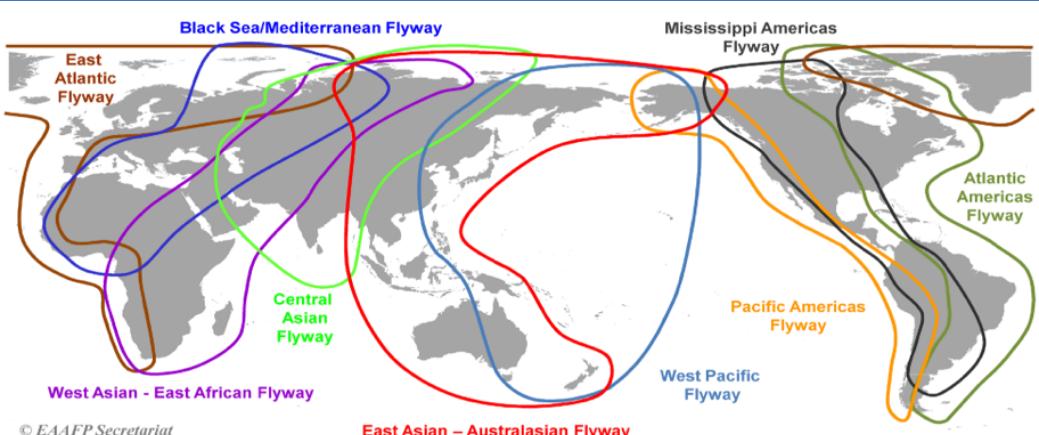
wider civil society to act to prevent the further damage or loss of the sites crucial to the survival of the world's birds.

11. MIGRATORY BIRDS AND FLYWAYS

- Bird migration is one of the great wonders of the natural world. A huge variety of birds, millions of them, make the journey: the tiny Rufous

Hummingbird

migrates up and down the North



American continent, while the Arctic Tern, BirdLife's emblem, migrates from pole to pole. In fact, roughly one in five bird species migrate.

- **Flyways**

- Flyways are **migratory path taken by birds every year between their summer breeding grounds and their wintering grounds**.
- While taking the migratory routes, **birds don't change path at random**. They follow set routes which **include habitats where they can rest and refuel along the way**.
- Many different **species share broadly similar routes**, which have **been loosely split into 9** (some sources mention 8) **major flyways**. They are like **bird super-highways across the sky**.

- **Flyways and India**

- **Major Bird Flyway Network through India**
 - » **370 species of birds visit India through three flyways:**
 - Central Asian Flyway (CAF)
 - East Asian - Australasian Flyway
 - Asian - East African Flyway
 - » **Over 80% of migratory birds through India comes through CAF** among which 87 species are of high conservation concern including two critically endangered, five endangered and 13 vulnerable species.
- **India has also launched the National Action Plan for conservation of migratory species under the Central Asian Flyway.**

- **Birdlife International's Flyway Program** focuses on **protecting birds across all major flyways**.

- Key aims of the BI's Flyway Program:
 - » **Save the threatened migratory species from extinction** by addressing main threats and conserve key sites and habitats which will be beneficial to a wider set of migratory species.
 - » **Address landscape-scale barriers** especially **illegal and unsustainable killings of birds** and **proliferation of poorly planned energy and power transmission infrastructure**.

- » **Conserve network of critical stopover sites** through action on the ground by BI's local conservation groups.
- » **Strengthen local and national capacity** in the stop-over sites by strengthening the collaboration between BirdLife Partners.

12. RAMSAR CONVENTION ON WETLANDS

- **What is a Wetland?**
 - A Wetland is a **transitional land between terrestrial and aquatic ecosystem**. It is an ecosystem that is flooded either permanently or seasonally.
 - **UN Ramsar Convention** defines wetlands as '*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh brackish or salt, including areas of marine water the depth of which at low tide doesn't exceed six meters*'.
- **Significance of Wetlands:** Wetlands provide a wide range of important resources and ecosystem services such as:
 - **Food:** Rice cultivation, fishery etc.
 - **Water storage and ground water recharge**
 - **Water purification, flood moderation and erosion control**
 - **Climate regulation**
 - **Tourism** is another area where Wetlands such as large lakes have played crucial role.
 - **Biodiversity** -> wetlands are transition zones between two different ecosystems and thus are highly productive.
 - **Coastal Protection** is ensured by Wetlands as they act as buffer zones.
- **Ramsar Convention**
 - **Introduction**
 - The **Convention on Wetlands of International Importance, called the Ramsar Convention**, is the intergovernmental treaty that provides the framework for the **conservation** and **wise use** of wetlands and their resources. It is the only global treaty that focuses on a single ecosystem (Wetlands).
 - The convention was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Since then almost 90% of UN member states, from all the world's geographic regions, have accepted and become contracting parties.
 - **Headquartered** in Geneva
 - **The aim** of the Ramsar list is "to develop and maintain an international network of wetlands which are important for the conservation of global biological diversity and for sustaining human life through the maintenance of their ecosystem components, processes and benefits".
 - **Concept of 'Wise use'** is at the centre of Ramsar Convention.
 - Through this, the convention continues to emphasize that **human use on sustainable basis is entirely compatible with Ramsar principles and wetland conservation in general**. Application of "wise use" concept is crucial to ensure that wetlands continue to support biological diversity as well as human well-being.

- The wise use guidelines emphasize on:
 1. Adoption of national wetland policies, involving review of local legislation and institutional arrangements to deal with wetland matters.
 2. Development of programs of wetland inventory, monitoring, research, training, education etc.
 3. Take action at wetland sites, involving the development of integrated management plans covering every aspect of the wetlands and their relationships.
- The concept applies to all wetlands and water resources in contracting parties territories (not just to Wetlands of International Importance)

1) LIST OF RAMSAR SITES IN INDIA: WETLANDS OF INTERNATIONAL IMPORTANCE

#	Name of the Site	State	Other Speciality				
1	Tso Kar Wetland Complex	Ladakh	<p>Tso Kar Wetland Complex was included in the Ramsar list in Dec 2020.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Location</th> <th style="text-align: center; padding: 5px;">Two Lakes</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; padding: 10px;">  </td><td style="text-align: center; padding: 10px;">  </td></tr> </tbody> </table> <p>The complex is a notable example of two connected lakes, the freshwater Startsapuk Tso & the hypersaline Tso Kar. They are situated in Changthang region of Ladakh.</p> <p>Tso Kar means white lake, because of the white salt efflorescence found on the margins due to the evaporation of highly saline water.</p> <p>The Tso Kar Basin is also an A1 category Important Bird Area (IBA) as per Bird Life International and a key staging site in the Central Asian Flyway.</p> <p>The site is also amongst the most important breeding areas of the Black-necked Crane (<i>Grus nigricollis</i>) in India.</p>	Location	Two Lakes		
Location	Two Lakes						
							

			This IBA is also the <u>major breeding area of Great Crested Grebe</u> (<u><i>Podiceps cristatus</i></u>), <u>Bar-headed Geese</u> (<u><i>Anser indicus</i></u>), Ruddy Shelduck, Brown headed Gull, Lesser Sand-Plover, and many other species.
2	Tso Moriri Lake	Ladakh	
3	Wular Lake	J&K	
4	Surinsar-Mansar Lakes	J&K	
5	Hokera Wetland	J&K	
6	Hygam Wetland Conservation Reserve	J&K	<p>It falls <u>within Jhelum River Basin</u> and plays an <u>significant role as a flood absorption basin, biodiversity conservation site, eco tourism site, and livelihood security of the local community.</u></p> <p>It is located in the <u>Baramulla district</u>. It serves as an <u>abode to many residents and migratory bird species</u>. It is also <u>recognized as an IBA</u>.</p> <p>High rate of siltation is leading to <u>wetland characteristics being changed to landmass in several areas</u>.</p>
7	Shallbugh Wetland Conservation Reserve	J&K	It is located in <u>Srinagar district</u> . It is an abode to <u>more than 4 lakh resident and migratory birds of at least 21 species</u> .
8	Harike Lake	Punjab	
9	Kanjli Lake	Punjab	
10	Ropar Lake	Punjab	
11	Keshopur-Miani Community Reserve	Punjab	
12	Beas Conservation Reserve	Punjab	
13	Nangal WIS	Punjab	
14	Chandertal Wetland	Himachal Pradesh	
15	Pong Dam Lake	Himachal Pradesh	
16	Renuka Wetland	Himachal Pradesh	Smallest of all Ramsar site in India.

17	Asan Conservation Reserve	UK	Became Ramsar Site in Oct 2020 It is a <u>444 hectare stretch of the Asan river</u> running down to its confluence with <u>Yamuna river</u> in <u>Dehradun</u> district of UK. The river was <u>dammed by the Asan Barrage</u> in 1967 and it resulted in <u>siltation above the dam wall</u> which created <u>suitable habitat for birds</u> . This supports, <u>330 species of birds</u> including the critically endangered vultures - (red headed vulture and white-rumped vulture) and <u>Baer's Pochard</u> . It is also a <u>significant ground for migratory birds</u> . It is strategically located <u>within the Central Asian Flyways</u> . This was <u>declared conservation reserve</u> in 2005 under <u>Section 36A of Wildlife Protection Act, 1972</u> .
18	Sultanpur	Haryana	<u>Sultanpur National Park from Haryana</u> supports more than <u>220 species</u> of resident, winter migratory and local migratory waterbirds at critical stages of their life cycles. More than ten of these are globally threatened, including the <u>critically endangered sociable lapwing</u> , and the <u>endangered Egyptian Vulture, Saker Falcon, Pallas's Fish Eagle and Black-bellied Tern</u>
19	Bhindwas	Haryana	Bhindwas Wildlife Sanctuary, <u>the largest wetland in Haryana</u> is a human-made freshwater wetland. Over 250 bird species use the sanctuary throughout the year as a resting and roosting site. The site supports more than ten globally threatened species including the endangered Egyptian Vulture, Steppe Eagle, Pallas's Fish Eagle, and Black-bellied Tern.
20	Keoldeo Ghana NP	Rajasthan	
21	Sambhar Lake	Rajasthan	
22	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh	
23	Nawab Ganj	Uttar Pradesh	
24	Parvati Agra	Uttar Pradesh	
25	Saman	Uttar Pradesh	
26	Samaspur	Uttar Pradesh	
27	Sandi	Uttar Pradesh	
28	Sarsai	Uttar Pradesh	

29	Sur Sarovar Lake (Keetham lake), Agra	Uttar Pradesh	<p>It is a <u>human made lake</u> that was created to <u>supply water to the city of Agra</u>. The wetland soon became an <u>important and rich ecosystem</u>. It now provides <u>refuge to resident and migratory birds</u>, and more than <u>60 species of fish</u>. It is located on <u>Delhi-Mathura Highway</u> in Agra district.</p> <p>It was <u>declared a bird sanctuary in 1991</u>.</p> <p>It is also listed as an <u>Important Bird Area</u>.</p> <p>Sur Sarovar also has the <u>biggest Bear Rescue Center</u> for rescued dancing bears.</p>
30	Bakhira WLS	Uttar Pradesh	
31	Haiderpur Wetland	Uttar Pradesh	<p>Haiderpur is one of the <u>largest human-made wetlands</u> that was <u>formed in 1984</u> after the construction of <u>Madhya Ganga Barrage</u> at the <u>confluence of Saloni and Ganga rivers</u>. It is a part of <u>Hastinapur WLS</u>.</p> <p>It covers an <u>area of 6,908 hectares</u> and is <u>situated on the Muzaffarnagar-Bijnor border</u>.</p> <p>Significance: Source of fresh water and ground water recharge Biodiversity Protection: It hosts, <u>more than 30 species of plants</u>, <u>over 300 species of birds</u> including <u>102 waterbirds</u> and <u>more than 40 fish and 10 mammals species</u>. It has <u>CR Gharials</u>; <u>EN Hog Deer</u>, <u>Swamp Deer</u>, <u>Black bellied Tern</u>, <u>Steppe Eagle</u>, etc.</p>
32	Kebartal Wetland (Kanwar Lake)	Bihar	<p>Kabartal (Kanwar Jheel) Wetland, Bihar Became Ramsar site in Oct 2020</p> <p>This is <u>Bihar's first Ramsar site</u>. It is located in Bihar's Begusarai district. It covers <u>2,620 hectares</u> of the Indo-Genetic plains in Northern Bihar. It is a <u>residual oxbow lake</u>, formed during the <u>meandering of Gandak river</u>, a tributary of Ganga in the geological past.</p> <p>It is an <u>important stopover along the Central Asian Flyway</u>, with <u>58 bird species</u> using it to rest and refuel.</p> <p>Some <u>critically endangered birds</u> of the site include <u>red-headed vulture</u>, <u>white rumped vulture</u>, <u>Indian Vulture</u>, <u>Baer's pochard</u>, and the <u>Sociable Lapwing</u>.</p> <p>Note: Kabartal is Asia's largest freshwater oxbow lake</p>

33	Deepor Beel	Assam	<p>It is a <u>lake located to the South West of Guwahati city</u> in Assam. It is a <u>permanent freshwater lake</u>, in a <u>former channel of Brahmaputra river</u>, to the south of the main river.</p> <p>It is also an <u>Important Bird Area</u>. It is <u>the only Ramsar site of Assam</u>.</p>  <p>The Deepor Bil WLS measures <u>4.1 sq km</u> within this wetland</p>
34	Loktak Lake	Manipur	
35	Pala Wetland	Mizoram	
36	Rudrasagar Lake	Tripura	
37	Nalsarovar Sanctuary	Bird	Gujarat
38	Thol Lake	Gujarat	Thol Lake Wildlife Sanctuary from Gujarat lies on the Central Asian Flyway and more than 320 bird species can be found here. The wetland supports more than 30 threatened waterbird species, such as the critically endangered White-rumped Vulture and Sociable Lapwing, and the vulnerable Sarus Crane, Common Pochard and Lesser White-fronted Goose
39	Wadhwan Lake	Gujarat	Wadhvana Wetland from Gujarat is internationally important for its birdlife as it provides wintering ground to migratory waterbirds, including over 80 species that migrate on the Central Asian Flyway. They include some threatened or near-threatened species such as the endangered Pallas's fish-Eagle, the vulnerable Common Pochard, and the near-threatened Dalmatian Pelican, Grey-headed Fish-eagle and Ferruginous Duck
40	Khijadia WLS	Gujarat	
41	Bhoj Wetlands	Madhya Pradesh	

42	Sakhya Sagar	Madhya Pradesh	
43	Sirpur Sagar	Madhya Pradesh	
44	Yashwant Sagar	Madhya Pradesh	<p>It is <u>one of the two Important Bird Areas (IBA) in the Indore region</u> as well as one of the <u>most important birding sites in Malwa region of Madhya Pradesh</u>.</p> <p>Presently it is being used for <u>water supply</u> to the city of Indore and is being also used for <u>fish culture on a commercial basis</u>.</p>
45	Sundarban Wetlands	West Bengal	<p>Largest Ramsar site in India Sundarbans</p> <ul style="list-style-type: none"> It comprises of <u>hundreds of islands</u> and a <u>network of rivers, tributaries and creeks</u> in the delta of the Ganga and the Brahmaputra at the mouth of Bay of Bengal in India and Bangladesh. Indian Sundarban consists of 60% of the country's total mangrove forest area. <p>Sundarbans Reserve Forest (SRF)</p> <ul style="list-style-type: none"> It is the <u>largest mangrove</u> in the world and is now a wetland of international importance. So, it has now become the largest protected wetland (4,23,000 hectare) in the country.
46	East Wetlands	Calcutta WB	<p>It comprises of <u>a larger number of waterbodies distributed east of city of Kolkata</u> across the districts of South and North 24 Parganas. It is spread <u>over 125 km²</u>.</p> <p>Along with the wetlands, it also <u>has 254 sewage-fed fisheries</u>, agricultural and solid waste farms and some built up areas.</p> <p>It was included in the Ramasar List in Aug 2002.</p> <p>The hydrology of this wetland is unique. It doesn't have a catchment area of its own. <u>Approximately 250 million gallons of sewage flows into it everyday</u>.</p> <ul style="list-style-type: none"> The sewage is then <u>drawn by the local fishery owners</u> into fish ponds or bheris directly from the tributary wastewater canals. .

			<ul style="list-style-type: none"> • Sunlight is enough to <u>promote high growth of dense plankton and algae</u> which serves as food for the fish population which thrive on the nutrient rich plankton. • Organic pollution in the wastewater is <u>thus reduced by 80% and the coliform bacteria in the wastewater is reduced by 99.9 %</u> in these ponds. <p>The Kolkata Municipal Corporation saves <u>Rs 5,000 - 7,000 crores every year</u> - the cost of sewage treatment plant for treating so much water.</p> <ul style="list-style-type: none"> • <u>Channels drain out the effluents and slurry from the treated wastewater</u>, that is then used <u>to grow rice and vegetables</u>. • <u>Around 25% of Kolkata's fish and vegetables are grown with the help of this water</u>. This wetland thus support livelihood of more than a lakh population. <p>It acts as kidney of Kolkata as <u>the wastewater from the city</u> is converted into food and used in fisheries and agriculture across this wetland.</p> <p>Bheris are a unique feature of the Kolkata wetlands, and are shallow fishponds fed by naturally treated wastewater rich in algae, which allows for low-cost fish cultivation.</p> <p>Safety of Fish/Vegetables: Some experts have raised the issue of <u>heavy metal contamination</u> from this kind of fishery and vegetable cultivation.</p>
47	Bhitarkanika Mangroves	Odisha	<p>Bhitarkanika is also the <u>second largest mangrove ecosystem</u> in the country (after Sundarbans).</p> <ul style="list-style-type: none"> • Freshwater mixed with seawater near the lower end of the <u>Brahmani and Kharasota river</u> to produce brackish water ideal for mangroves. <p>Key threats:</p> <ul style="list-style-type: none"> • Diversion of water from Brahmani river basin: The Talcher-Angul coal mines, steel and power generating units as well as the Kalinga Steel and power hub in Jajpur district were <u>drawing enormous quantities of freshwater from the Brahmani river</u>.
48	Chilka Lake	Odisha	
49	Satkosia Gorge	Odisha	

50	Tampara Lake	Odisha	<p>It is the <u>most prominent fresh water Lake</u> situated in the state of Odisha (Ganjam district). <u>The depression in the ground gradually filled with rainwater from catchment flow and was called "Tamp"</u> by the British and subsequently termed "Tampara" by the locals. It supports varied biodiversity including that of birds, fishes, phytoplanktons, and more than seven species of terrestrial plants and macrophytes. It is important habitat for <u>vulnerable species</u> such as <u><i>Cyprinus carpio</i></u>, <u>common pochard</u> (<i>Aythya ferina</i>), and river tern (<i>Sterna aurantia</i>).</p> <p>With large fish yield, it is an <u>important source of livelihood for the local communities</u>.</p>
51	Hirakud Reservoir	Odisha	<p>It is the <u>largest earthen dam</u> in Odisha which <u>started operating in 1957</u>.</p>
52	Ansupa Lake	Odisha	<p>It is the <u>largest freshwater lake of Odisha</u> situated in the <u>Banki</u> sub-division of Cuttack district and has its fame from time immemorial for its scenic beauty.</p> <p>It is an <u>oxbow lake</u> formed by <u>River Mahanadi</u> and is spread over 231 ha. It is home to several species of birds, fishes, mammals and macrophytes. It provides a safe habitat for <u>at least three threatened bird species</u> - <u><i>Rynchops albicollis</i> (EN)</u>, <u><i>Sterna acuticauda</i> (EN)</u> and <u><i>Sterna aurantia</i></u> and <u>three threatened fish species</u> - <u><i>Clarias magur</i> (Clariidae) (EN)</u>, <u><i>Cyprinus carpio</i> (Cyprinidae) (VU)</u>, and <u><i>Wallago attu</i> (VU)</u>.</p> <p>The lake also <u>sustains fresh water demand of the surrounding area</u> and supports <u>livelihood of local communities through fisheries and agriculture</u>.</p> <p>It is a <u>famous wintering ground for migratory birds</u> and is also <u>known for its scenic beauty</u>.</p>
53	Nandur Madhameshwar	MHA	
54	Lonar Lake	MHA	<p>It is an <u>ancient circular crater lake</u> created by <u>Meteorite strike</u> in Maharashtra</p> <p>It got <u>National geo-heritage tag in 1979</u>.</p> <p>It is <u>relatively young geo-logically</u>, just about 50,000 years old.</p> <p>A meteorite <u>estimated to weigh two-million-tonnes slammed into the Earth</u>, creating a 1.83-km diameter crater where the lake formed. It is distinguished by a <u>near-perfect</u>,</p>

			<p><u>circular ejecta blanket</u>, which refers to earth thrown up during the collision, around it.</p> <p>It is an <u>endorheic</u> (i.e., no outflow) basin, almost circular in shape.</p> <p>The lake is <u>high in salinity and alkalinity</u>, as the lack of outflow leads to a concentration of minerals as the lake water evaporates.</p> <p><u>Outside the lake</u>, there is a <u>considerable diversity of plant and animal life</u>, as springs which help feed the lake provide a source of fresh water.</p>
55	Thane Creek	Maharashtra	<p>It is located in <u>Maharashtra India</u>. Thane Creek is an <u>inlet in the shoreline of the Arabian Sea</u> that <u>isolates the city of Mumbai from the Konkan region of the Indian Mainland</u>. There are <u>several source of fresh water to the Creek</u>, the <u>largest being the Ulhas River</u>. It has been declared as <u>Thane Creek Flamingo sanctuary</u>.</p> <p>Thane creek is <u>fringed by Mangroves on both banks & comprise around 20% of the total Indian mangrove species</u>.</p> <p>The mangrove serves as a nursery for several fishes & sustains the local fishery. The area is an <u>important part of the wetland complex of the Central Asian Flyway of the birds</u> and has been categorized as IBA.</p> <p>Thane Creek Flamingo Sanctuary: The Western bank of the Thane Creek has been declared the "<u>Thane Creek Flamingo Sanctuary</u>".</p> 
56	Kolleru Lake	AP	
57	Nanda Lake	Goa	

58	Ranganathittu Bird Sanctuary	Karnataka	
59	Magadi Kere Conservation Reserve	KAR	Artificial Lake One of the <u>largest nesting ground for bar headed goose</u> in southern India
60	Ankasamudra Bird Conservation Reserve	KAR	Artificial Lake Home to 210 species of plants, 8 species of mammals, 25 species of birds, and 41 species of fish
61	Aghanashini Estuary	KAR	The site is an estuary where the <u>Aghanashini River</u> flows into the <u>Arabian Sea</u> in Karnataka state. It addition to its <u>estuarine and shallow marine waters</u> , it features <u>rocky and pebble shores</u> , intertidal mudflats and some aquaculture ponds and rice fields. These diverse environments provide <u>habitat to more than 80 fish, 115 birds</u> and 45 mangroves species.
62	Karaivetti Bird Sanctuary	TN	It is <u>one of the most important fresh water feeding grounds for migratory water birds</u> in the state of TN. It is also an important nesting site for threatened species like the <u>spotted eagle</u> and the <u>tawny eagle</u> .
63	Longwood Shola Reserve Forest	TN	It is among the <u>last vestiges of urban shola forest</u> , where everything <u>else has been lost to tea cultivation</u> and other land use changes.
64	Point Calimere	TN	
65	Karikili Bird Sanctuary	TN	
66	Pallikaranai Marsh Reserve Forest	TN	
67	Pichavaram Mangrove	TN	
68	Gulf of Mannar Marine Biosphere Reserve	TN	
69	Konthankulam Bird Sanctuary	TN	
70	Udhayamarthandapuram Bird Sanctuary	TN	
71	Vedanthangal Bird Sanctuary	TN	

72	Vellode Sanctuary	Bird	TN	
73	Vembannur Wetland Complex		TN	
75	Chitrangudi Sanctuary	Bird	TN	<p>Chitrangudi Bird Sanctuary, locally known as "Chitrangudi Kanmoli" is located in <u>Ramnathapuram district of TN</u>. Notable waterbirds spotted from the site are <u>spot billed Pelican</u>, <u>little egret</u>, <u>grey heron</u>, <u>large egret</u>, <u>Open billed stork</u>, <u>Purple</u>, and <u>pond herons</u>.</p>
75	Suchindram Theroor Wetland Complex		TN	<p>It is part of the <u>Suchindram-Theroor Manakudi Conservation Reserve</u>. It is an <u>important bird area</u> and <u>lies at the southern tip of the Central Asian Flyway</u> of migratory birds.</p> <p>It was <u>formed for birds' nesting purposes</u> and it attracts <u>thousands of birds</u> every year.</p>
76	Vaduvur Sanctuary	Bird	TN	<p>It is a <u>large human made irrigation tank</u> and <u>shelter for migratory birds</u> as it <u>provides a suitable environment for food, shelter, and breeding ground</u>.</p> <p>While these irrigation tanks have <u>socio-economic and cultural significance</u>, very little is known of their ecological importance.</p> <p>These tanks have the potential to harbor good populations of resident and wintering water birds but no studies have been done to confirm this.</p>
77	Kanjirankulam Sanctuary	Bird	TN	<p>It is a protected area <u>near Mudukulathur Ramanathapuram District, TN</u>. It is <u>notable nesting site for several migratory heron species</u> that roost in the prominent growth of babul trees here.</p> <p>The breeding population of migratory waterbirds arrive here between October and February and include: Painted stork, white ibis, black ibis, little egret, great egret.</p>
78	Ashtamudi Lake		Kerala	
79	Sashthamkotta Lake		Kerala	
80	Vembanad Wetland	Kol	Kerala	

- **Note1:** Globally, there are around 2500 wetlands in Ramsar list. India with 80 Ramsar Sites have the highest number of wetlands in South Asia.

2) HOW A SITE IS DESIGNATED AS RAMSAR SITE

- According to Ramsar convention "**Each contracting party shall designate** suitable wetlands within its territory for inclusion in a List of Wetlands of International Importance".
- The wetlands are selected on account of their international significance in terms of ecology, botany, zoology, limnology, or hydrology. Accordingly any wetland which meets **at least one of the criterion of identifying Wetlands of International Importance (9 criteria)** can be designated by the appropriate national authority to be added in the Ramsar list.
- The **Ramsar secretariat ensures that data and map meet the standards set by the Conference of parties**, before publishing the information on the site of the **Ramsar Sites Information System**.
- The **nine criteria for identifying Wetlands of International Importance**:
- **Group A of the Criteria:** Sites containing representative, rare or unique wetland types
 - **Criterion 1:**
 - A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.
- **Group B of the Criteria.** Sites of international importance for **conserving biological diversity Criteria based on species and ecological communities**
 - **Criterion 2:** It supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
 - **Criterion 3:** It supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.
 - **Criterion 4:** It supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.
- **Specific criteria based on water birds**
 - **Criterion 5:** It regularly supports 20,000 or more water birds.
 - **Criterion 6:** It regularly supports 1% of the individuals in a population of one species or subspecies of water bird.
- **Specific criteria based on fish**
 - **Criterion 7:** It supports a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity.
 - **Criterion 8:** It is an **important source of food for fishes, spawning ground, nursery and/or migration path** on which fish stocks, either within the wetland or elsewhere, depend.
- **Specific criteria based on other taxa**

- Criterion 9: It regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species

3) MONTREUX RECORD

- It is the principle tool of the Ramsar Convention for highlighting those sites, where an adverse change in ecological character:
 - Has occurred
 - Is occurring
 - Is likely to occur as the result of technological developments, pollution or other human interference and which are therefore, in need of priority conservation attention.
- If such changes are brought to the notice of the Convention Secretariat (by Government or by NGOs), the site is then placed under Montreux Record.
 - This is a **means to drawing attention** to such sites, and it is subject to continuous review.
 - Convention Secretariat, will help the country in taking conservation measures, and if they succeed, the site may be removed from the Montreux Record after a review, and at the request of the country.
- **Indian Ramsar Sites in Montreux Record:**
 - Keoladeo National Park
 - Loktak Lake
 - Chilka lake was once placed on the record. Later, when conservation measures were implemented and succeeded, it was removed from the record.

4) THREATS FACED BY WETLANDS IN INDIA

- **Water Pollution**
- **Noise Pollution** caused by rapid urbanization around the wetlands continues to be an irritant and is putting migratory visitors away.
- **Dumping of Wastes** (Municipal solid waste, construct waste) etc is leading to loss of Wetlands.
- **Very less focus** on small non-notified wetlands.
 - Absence of any inventory related to wetlands.
- **Lack of resources with local bodies** to ensure proper care and protection of the wetlands.

5) WORLD WETLAND DAY: 2ND FEBRUARY

- World wetland day is celebrated every year on 2nd February. The date marks the day of adoption of Ramsar Convention on Wetlands on 2nd February 1971, in the Iranian city of Ramsar on the shores of the Caspian sea.
- **Theme for 2023:** "Wetland Restoration"
 - It highlights the urgent need to prioritize wetland restoration.
- **Why Wetland is significant for Biodiversity?**

- It is stressed by the recently released global **IPBES assessment** which identifies wetlands as the most threatened ecosystem. This impacts **40% of the world's plants and animals** that live or breed on wetlands.

6) WETLAND (CONSERVATION AND MANAGEMENT) RULES, 2017

- It was notified by MoEF&CC replacing the 2010 rules.
- **Key Highlights**
 - **Decentralization** -> empowers states and Uts to identify and manage their wetlands.
 - **State Wetland authorities** to be established in each state and UT
 - Headed by State environment minister.
 - **National Wetland Committee:** It will replace Central wetland regulatory authority and will be responsible for monitoring the implementation of these rules
 - Headed by Secretary, MoEF&CC.
 - It will also advise the central government on appropriate policies and action programmes.
 - **Banned activities** like dumping solid waste, electronic etc.
 - **Applicability**
 - Wetland classified under RAMSAR
 - Wetland notified by Central, state or UTs.

13. WORLD WILDLIFE DAY: 3RD MARCH

- It is celebrated on 3rd March
- **UNGA** in 2013 had passed a resolution for choosing 3rd of March as the WWD. This day was chosen as on March 3, 1973, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was adopted.

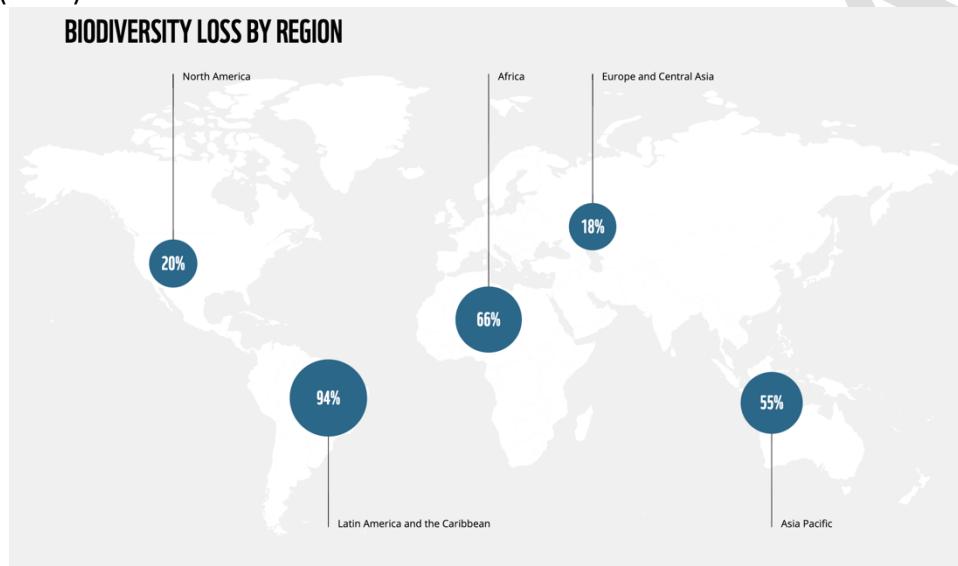
14. WORLD WILDLIFE FUND FOR NATURE (WWF)

1) ABOUT WWF

- The World Wildlife Fund for Nature is an international NGO founded in 1961, working in the field of wilderness preservation, and the reduction of human impact on the environment.
- It is considered the world's largest privately financed conservation organization, with over 5 million supporters worldwide working in more than 100 countries and on more than 3,000 projects.
- **Important Reports:** The Living Planet Report has been published every two years since 1998
- **Important Campaigns by WWF**
 - **Earth Hour** - Encourages everyone to switch off non-essential electric lights, for one hour, from 8:30 - 9:30, on a specific day towards the end of March.
 - Earth hour 2020 was held on 28th March.
 - **Debt for Nature Swaps** are financial transactions in which a portion of a developing countries foreign debt is forgiven in exchange for local investments in environmental conservation measures.

2) REPORT: LIVING PLANET REPORT

- The Living Planet Report comprehensive study of trends in global biodiversity and the health of the planet.
- A Living Planet Index (LPI), featuring about 32,000 populations of 5,230 species across the world, showed that vertebrates wildlife populations are plummeting at a particularly staggering rate in tropical regions of the world.
- In last 50 years, there has been 69% decline in the wildlife populations of mammals, birds, amphibians, reptiles and fish.
- **Region with highest decline** -> Latin America and the Caribbean region (-94%); followed by Africa (-66%) and Asia Pacific (-55%)



- **Freshwater species** populations has globally reduced by 83%, confirming that the planet is experiencing a "biodiversity and climate crisis."
 - Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species.
- **WWF has identified six key threats to biodiversity:**
 - Agriculture; Hunting; Logging; Pollution; Invasive Species and Climate Change
- **Recommendations/Suggestions:**
 - Biodiversity crisis and Climate Change has to be dealt with together - instead of two different issues, as they are intertwined.

15. INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIP'S BALLAST WATER AND SEDIMENTS (ALSO KNOWN AS "BALLAST WATER MANAGEMENT CONVENTION")

- Convention was **adopted in Feb 2004 by 74 countries** (now 86 countries are signatories).
 - It **came into force in Sep 2017**.
- It is a maritime treaty which **requires signatory states to ensure** that ships flagged by them comply with standards and procedures for the management and control of ship's ballast water and sediments.
- **Objective**
 - Prevent, minimize, and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control, and management of ship's ballast water and sediments.

- **Main Provisions**
 - **General Abilities:** Ships must have facilities to treat the ballast water before releasing it in foreign waters.
 - **Reception Facilities:** Under Article 5 Sediment Reception Facilities Parties undertake to ensure that ports and terminals where cleaning or repair of ballast tanks occurs, have adequate reception facilities for the reception of sediments.
 - **Research and Monitoring**
 - » Article 6 calls for parties individually or jointly to promote and facilitate scientific and technical research on ballast water management; and monitor the effects of ballast water management in waters under their jurisdiction.
- **Note:** India is **not participating** in the convention.

16. INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE (ITPGR)

- **Why in news?**
 - India hosted the 9th session of the Governing Body (GB9) of the ITPGR (Sep 2022)
- **Introduction**
 - This is a treaty which is aimed at:
 - » **Conservation and sustainable use of all plant genetic resources for food and agriculture and;**
 - » **The fair and equitable sharing of the benefits** arising out of their use, in harmony with the CBD, for sustaining agriculture and food security.
 - **Recognizing the contribution of farmers** to the diversity of crops that feed the world.
 - Ensuring that the recipients share the benefits they derive from the use of genetic materials with the countries where they have been originated.
 - » Establishing **a global system to provide farmers, plant breeders and scientists with access to plant genetic material.**
- It was adopted by the **31st session of the Conference of Food and Agriculture Organization (FAO) of the UN on Nov 3, 2001.**
- **Main Provisions**
 - 1. Multilateral System**
 - It is the treaty's innovative solution to access benefit sharing.
 - It puts **64 of the world's most important crops** - crops that together account for 80% of the food we derive from plants - into an easily accessible global pool of genetic resources that is freely available to potential users in the Treaty's ratifying nations for some uses.
 - 2. Access and Benefit Sharing**
 - Ratifying nations are provided facilities to access the genetic material for the 64 crops in the Multilateral System for research, breeding and training for food and agriculture.
 - Prevent the recipient of genetic resources from claiming IPR over those resources in the form in which they received them.

- Those who access genetic materials through the multilateral system agree to share the benefits from their use through the benefit sharing mechanisms established by the treaty.

3. Farmer's right

- The treaty calls for protecting the traditional knowledge of these farmers, increasing their participation in national decision-making process, and ensuring that they share in the benefits from the use of these resources.

4. Sustainable Use

- Most of the world's food comes from four main crops - Rice, Wheat, Maize and Potatoes.
- However, local crops, not among the main four, are a major food source for hundreds of millions of people and has potential to provide nutrition to countless others.
- The treaty helps maximize the use and breeding of all crops and promotes development and maintenance of diverse farming systems.

- The Ninth session of the Governing Body (GB9) of the International Treaty on Plant Genetic Resources of Food and Agriculture (ITPGRFA) was held in New Delhi (Sep 2022)

- Key Highlights:

- In a historical first, Federation of Seed Industry of India (FSII) contributed Rs 20 lakhs (USD 25,000) to the Benefit Sharing Fund (BSF) as the first collective contribution from Indian seed sector, during the GB-9 meeting.
 - The BSF is the funding mechanism of the treaty used for support of capacity building, Conservation and sustainable use projects among the Contracting parties of the Treaty.
- India appointed as the co-chair of the Working Group on "Enhancement of MLS (Multilateral System)"
- Consensus on Implementation of Farmers Rights Reached after extensive negotiation at GB9
- India flags issue regarding genebank funding

17. WORLD SEED VAULTS

- Introduction:

- Seed vaults are places where seeds of various plants are stored to ensure protection of genetic resources and diversity.
 - » They are stored at very low temperatures (at around -18 degree C).
 - » Even at this temperature, seeds have a shelf life and thus seed vaults are regularly updated with fresh, viable samples.

- Svalbard's Vaults, at Spitsbergen, Norway

- It stores crop seeds.
- It is built inside a mountain on the remote Arctic Archipelago of Svalbard. It was opened in 2008 with the intention of being politically neutral and safe location to protect the world's crop diversity. It is designed to survive nuclear war and world war.

- Samples sent here are the duplicates from seed and gene banks, research facilities, and communities around the world, ranging from large institutions like ICARDA, to the Cherokee Nation, who in 2020, became the first tribe in the U.S. to send important heirloom seeds to Svalbard.
- During the **Syrian war**, scientists uplicated and safely transported genetic resources from International Center for Agriculture Research in the Dry Areas facility in Tal Hadia.
- **Millennium Seed Bank** at the Royal Botanic Gardens, Kew, UK is the world's largest wild seed conservation project.
 - It has recently completed 20 years of its formation.
 - Its vault has been built to withstand bombs, radiation, and floods. It holds **2.4 billion seeds** from 39,681 species, coming from 190 countries and territories.
 - The facility claims that they have contributed to protecting 16% of the world's seed-bearing plants.
 - **After the recent massive bushfire in Australia**, the seed bank sent backup seeds of **clover glycine (Glycine latrobeana)**, a rare, wild pea, to its partners in Australia so that the plant could be cultivated and used to restore the ecosystem.
- **Other important seed banks**
 - **The Australian Grains Genebank (AGG)**
 - **Vavilov Institute of Plant Industry**, Russia

18. ANTARCTIC TREATY SYSTEM

- a. **Antarctic Treaty:**
 - It is a treaty that was negotiated during the middle of the Cold War by 12 countries with Antarctic interests. It acts as a foundation for rule based international order for a continent without a permanent population. It remains the only example of a single treaty that governs a whole continent.
 - It is a **remarkably short treaty** and contains only 14 articles. Key provisions include promotion of Freedom of Scientific Research, the use of continent only for peaceful purposes, and the prohibition of military activities, nuclear tests, and the disposal of radioactive waste.
 - The **most important provision** of the treaty is **Article IV**, which effectively seeks to neutralize territorial sovereignty in Antarctica. This means that a limit was placed on making any new claim or enlargement of an existing claim. Further, **no formal recognition** was given to any of the **seven territorial claims** on the continent, by Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom.
 - **Russia, USA, and China** - who are signatory to the conventions but have not made any formal territorial claims - are also bound by the limitations of Article IV.
 - **How has the treaty expanded for 60 years?**
 - Though the compact was held for 60 years, there have been tensions from time to time. For e.g. between UK and Argentina.
 - A key reason because of which the treaty has survived is that it has kept on evolving through a series of additional conventions and other legal protocols.
 - Various disputes have been addressed through the expansion of the treaty framework with new agreements. This framework is now referred to as the "**Antarctic Treaty System**".

- These measures have been a great success, but tensions have arisen in recent years over the promotion of Southern Ocean Marine Reserves. In 2016, agreement was reached on Ross Sea Marine Protected Area, and momentum is building for a broader network of Southern Ocean Marine Protected Areas. China and Russia have resisted these initiatives.
- By, 2020 the treaty has 54 signatories.
- **Changing Circumstances between 1950s to 2020s**
 - Though the treaty has been successful in responding to various challenges so far, the circumstances are radically different now. Antarctic is much more accessible both due to climate change and technological improvement. More countries now have substantive interest in the region when compared to only 12 in the beginning.

19. CONVENTION FOR THE CONSERVATION OF ANTARCTIC MARINE LIVING RESOURCES (CCAMLR)

- **About the CCAMLR**
 - It is part of Antarctic Treaty System. It was entered into force on 7th April 1982 and is headquartered in Hobart City of Tasmania State, Australia.
 - The immediate reason for the convention was the concerns related to increased krill catches in the Southern Ocean which could have had a serious impact on populations of other marine life which are dependent upon krill for food.
 - It is aimed at preserving marine life and the environmental integrity in and near Antarctica. It thus wants to ensure sustainable utilization of resources of Southern Ocean and regulates the use of resources in the region.
 - The commission has 26 members (25 countries + European Union) presently.
 - Note:** India is a member state.
- **Marine Protected Areas**
 - In 2009, the commission by consensus decided to create a network of Marine Protected Areas (MPAs).
 - It was the first international body to do this on the recommendations from the United Nations World Summit on Sustainable Development.
- **Designated or Proposed Marine Protected Areas**

South Orkneys MPA - Designated

Designated in 2009, around South Orkneys Island in the Southern Ocean



Ross Sea MPA - Designated

Designated in 2016



- **East Antarctica, Weddell Sea and Antarctic Peninsula** are the three others proposed MPAs yet to be approved by the commission.
- **East Antarctica** (proposed MPA) will protect blocks of oceans and ocean floor along the East Antarctica, an area rich in cold water corals that provide foraging ground for penguins.
 - It has been proposed by Australia, France, and European Union. It will protect one million square kms of ocean but has been repeatedly been struck down at the meetings of CCAMLR since 2010.
 - Members like **China** and **Russia** have opposed it due to economic and political reasons.
 - **All 26 members** must consent for the creation of Marine Park.
 - **What will be the impact of creation of MPA in East Antarctica?**
 - Ban on fishing in a vast area of the Weddell Sea and parts of Antarctic Peninsula. It will lead to safeguarding of species including penguins, killer whales, leopard seals, and blue whales.
 - It would also play an important role in fighting climate change as the seas around Antarctic are very important sink for Carbon dioxide.
- **Weddell Sea** - lies adjacent to Antarctic Peninsula. It made an MVA, it would become the largest nature reserve anywhere in the world.
- **Antarctica Peninsula** (the area to the west of Antarctic Peninsula) is particularly vulnerable to tourism impacts, fishing activities and global warming. About 75% of the Antarctic Krill is located here.
- In Sep 2021, India announced that it is considering to co-sponsor an MPA proposal at the CCAMLR and getting aligned with countries such as Argentina, Brazil, Chile, Korea, New Zealand, South Africa and USA, which are also proactively supporting the MPA proposals.

A) KRILL FISHERY AND ASSOCIATED ISSUES:

- Krill is the most abundant species in the world, with a biomass of 400 million tons in the Antarctic.
- **Significance:**
 - **Main Source of food for ocean wildlife** including whales, penguins and seals, any disruption to krill populations will ripple across the ecosystem.
 - **Note:** Krill is not a fish, it's a **Crustacean** (a type of arthropod).
- **Fighting Climate Change:** Krill are integral in influencing atmospheric carbon levels, and have the capacity to remove upto 12 billion tonnes of carbon every year from the Earth's atmosphere.
- **Competition for krills is increasing** as the human demand for krill products increase.

- Useful Video: <https://youtu.be/4euvH0K3lsQ>
 - Antarctic Krill Fishery: [Krilling for Oil | Oceans. Inc](#)

20. 6TH MASS EXTINCTION/ HOLOCENE EXTINCTION/ ANTHROPOCENE EXTINCTION

- **Background: Earth's previous five extinction:** Earth is the only known planet to support life. Various kinds of life forms have survived here for at least 3.5 billion years. But it's hospitality doesn't show consistency. In fact, **within the last 500 million years, the natural disasters have caused at least 5 mass extinctions** which wiped out **50-90% of all species on the planet** at the time.

1. End-Ordovician, 443 million years ago

- A severe ice age led to sea level falling drastically upto 100 meters, which wiped out 60-70% of all species which were prominently ocean dwellers.
- Then soon after the ice melted leaving the oceans starved of oxygen.

2. Late Devonian, 360 million years ago

- A messy prolonged climate change event, hit the life in shallow seas very hard, killing 70% of the species including almost all corals.

3. Permian-Triassic, 250 million years ago

- It has been the biggest and worst mass extinction in last 500 million years. More than 90% of the species perished, including trilobites and giant insects - strongly linked to massive volcanic eruptions in Siberia that caused a savage episode of global warming.

4. Triassic-Jurassic, C 200 million years ago

- 75% of species were lost, again most likely due to another huge outburst of volcanism. It left earth clear for dinosaurs to flourish.

5. Cretaceous - Tertiary, 65 million years ago

- A giant asteroid impact on Mexico, just after large volcanic eruptions in India saw the end of 60% of the species that populated the planet including dinosaurs.
- Mammals, and eventually humans took advantage.

- **6th Mass Extinctions** refers to ongoing extinction of various plants and animal species mostly as **a result of human activity**. Scientists believe that billions of population of mammals, birds, reptiles and amphibians have been lost all over the planet, leading them to say a sixth mass extinction has already progressed further than was thought.

- According to a research published in the journal proceedings of the National Academy of Sciences of the United States of America (PNAS), **the ongoing sixth mass extinction** may be one of the most serious environmental threats to the persistence of civilization.

- » This extinction is human caused and is more immediate than climate destruction.
- » The study found that 515 species of terrestrial vertebrates are near extinction.
 - Most of these species are from South America (30%), followed by Oceania (21%), Asia (21%), and Africa (16%) among others.
- » The current loss of species has been occurring since 1800s.

- A study published by University of Hawaii (Jan 2022)
 - » The current mass extinction has been going on since 16th century. Since then earth has lost 1,50,000 to 260,000 species (around 7.5 to 13 percent of its two million species)
 - » It also said that the Red List is biased and leaves out most invertebrates - a group that has seen a dramatic loss and is the majority of diversity on Earth.
- Some other scientists believe that sixth mass extinction is not already under way, but we are on the edge.
- Scientists blame the following factors for this:
 - » Human Over-population and over-exploitation of resources
 - Habitat loss and fragmentation represent primary threat for 85% of all species on the IUCN Red list.
 - It includes deforestation for farming, logging and settlement.
 - » Poaching in case of large animals prized for their body parts (tiger, elephant, lion etc)
 - » Pollution is pervasive in many species, from chemicals like mercury that accumulate in fish to the plastic debris that slowly kill sea turtles, sea birds and cetaceans.
 - » Introduction of Invasive species
 - It threatens a variety of native plants and animals around the world by killing them directly or by outcompeting them for food and nest sites.
 - » Climate Change has also negatively impacted entire ecosystems
 - An economy based on fossil fuels (that pollute the atmosphere) and are producing global warming with dire consequence for ecosystem.
 - An example of the impact of climate change can be seen in case of Corals. The warming of the water and acidification of oceans (due to high CO₂ in the atmosphere) are the principle reason for corals dying.
- This mass extinction will have serious ecological, economic and social consequences
 - » Human civilization is completely reliant on healthy ecosystem for food, water and other resources.

21. IMPORTANT DAYS

1) UN WORLD WATER DAY: 22ND MARCH

- The day is used to advocate for the sustainable management of freshwater resources.
- The **UN World Water Development Report** is released around World Water Day by **UN-Water** every year.

2) WORLD ENVIRONMENT DAY: 5TH JUNE

- The United Nations has designated 5th June as the World Environment Day. The UNEP annually organizes events for World Environment Day, which encourages worldwide awareness and action for the protection of the environment. Since 1974, it has been celebrated every year engaging governments, businesses, celebrities, and citizens to focus their efforts.

3) WORLD OCEAN DAY: 8TH JUNE

- June 8 is the World Ocean Day, the UN day for celebrating the role of oceans in our everyday life and inspiring actions to protect ocean and sustainably use marine resources.
 - » Many countries have been celebrating this day since 1992, following the UN conference on Environment and Development, held in Rio de Janeiro.

» UNGA officially decided this in 2018.

4) EARTH DAY: 22ND APRIL

- The day is celebrated world-wide to demonstrate support for environment protection.
- The day was first proposed in UNESCO conference in 1969 and the first Earth Day Celebrations took place in 1970.

