DAILY CURRENT AFFAIRS ANALYSIS

28 AUGUST 2024

1 - The State of the World's Mangroves 2024: A Comprehensive Overview:

GS III

Environmental Conservation related issues:

- **Context/Why in News?**

- On World Mangrove Day (July 26), the Global Mangrove Alliance (GMA) released a significant report titled "The State of the World's Mangroves 2024." This report highlights the critical role of mangroves in environmental conservation and the alarming challenges they face globally. The GMA, an alliance of over 100 members, is at the forefront of mangrove conservation and restoration efforts worldwide.

- **Introduction:**

- Mangroves, often termed as the "coastal guardians," are unique ecosystems providing immense ecological, economic, and cultural benefits. The "State of the World's Mangroves 2024" report by the Global Mangrove Alliance sheds light on the current status of these vital ecosystems, highlighting their importance, challenges, and the necessary steps for their protection and restoration.

- **Key Benefits of Mangroves as Highlighted in the Report:**

- **Improved Mapping:** The latest world map (GMW v4.0), developed by the Global Mangrove Watch, showcases a significant enhancement in spatial resolution, offering a sixfold improvement. This map details 147,256 km² of mangroves as of 2020, with new data added for six additional territories.
- **Global Distribution:** Southeast Asia emerges as the hub of the world's mangroves, holding about one-third of the total, with Indonesia alone accounting for 21%.
- **Carbon Storage:** Mangroves are exceptional carbon sinks, holding an average of 394 tonnes of carbon per hectare in their biomass and soil. Certain areas, such as in the Philippines, surpass this average, storing over 650 tonnes per hectare.
- **Biodiversity Hotspots:** Mangroves serve as a vital ecotone, supporting a diverse range of species. Indian mangroves alone harbor over 5,700 species across 21 phyla, emphasizing their ecological richness.
- **Flood Mitigation:** Mangroves are natural barriers against flooding, reducing flood depths by 15-20%, and in some regions, by over 70%. This capability is crucial as flooding becomes more frequent due to climate change.
- **Food Security:** Mangroves play a critical role in global fisheries, supporting nearly 800 billion young aquatic species annually. They also provide non-aquatic resources like honey, leaves, and fruits, essential for the livelihoods of local communities.

- **Cultural Significance:** Various mangrove species are integral to traditional medicine, offering health benefits to indigenous populations.
- **Highlights on India's Mangrove Ecosystems:**

- **Mangrove Cover in India:** West Bengal leads in mangrove cover in India, followed by Gujarat, with significant areas in the Gulf of Kutch and Gulf of Khambhat.
- **Biodiversity:** Indian mangrove ecosystems are among the most biodiverse globally, with a recorded total of 5,746 species. Of these, 4,822 species (84%) are animals, showcasing the rich biodiversity within these ecosystems.
- **Threats to Mangroves:** The report identifies critical threats to India's mangroves, particularly in the southern Indian coast. Natural mangrove forests in regions like the Lakshadweep archipelago and Tamil Nadu are critically endangered due to rising sea levels. Shrimp aquaculture has been pinpointed as a major driver of mangrove loss in states such as Andhra Pradesh, West Bengal, and Gujarat. On the western coast, extending from Gujarat to Kerala, human activities and natural threats like tropical storms pose significant challenges to mangrove conservation.
- **Conservation Initiatives:** The Indian government has launched the Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) program, aiming to expand mangrove cover by planting in 540 sq km across 11 states and two Union territories. Corporate entities have also joined the conservation efforts, with six major corporations signing MoUs with the Gujarat forest department to plant mangroves in 30 sq km.

- **Challenges Highlighted in the Report:**

- **Conversion to Aquaculture:** A significant portion (26%) of mangrove loss between 2000 and 2020 is attributed to conversion to aquaculture, particularly shrimp farming. The expansion of oil palm plantations and rice cultivation further exacerbates this destruction, accounting for 43% of mangrove losses.
- **Logging and Degradation:** Mangroves are being degraded due to logging for timber and charcoal production, leading to severe ecosystem damage.
- **Climate Change Impacts:** Rising sea levels, driven by climate change, pose a serious threat to mangrove habitats, especially those with limited freshwater and sediment input. Natural retraction influenced by climate change, sediment shifts, and sea-level rise has impacted 26% of mangrove areas.
- **Cyclonic Storms:** The increasing frequency and intensity of cyclonic storms are causing significant damage to mangrove ecosystems, further threatening their survival.
- **Global Protection Gaps:** Despite conservation efforts, only 40% of the world's remaining mangrove forests are under protected areas. Some countries, such as Malaysia and Myanmar, have less than 5% of their mangroves protected.
- **Pollution and Financial Challenges:** Pollution, particularly from oil spills (8.2%), poses severe risks to mangrove health, notably in regions like the Niger Delta. Securing adequate financing for mangrove conservation remains a major challenge.

- **Steps Suggested for Mangrove Protection:**

- **Guiding Principles for Mangrove Restoration:**
- **Safeguard Nature and Maximize Biodiversity:** Protect existing mangrove ecosystems, enhance their resilience, and implement science-based restoration protocols. International frameworks like the Kunming-Montreal Global Biodiversity Framework are essential for guiding these efforts.
- **Employ the Best Practices:** Utilize the best available scientific knowledge, including Indigenous, traditional, and local insights, for mangrove interventions. Successful community-led restoration projects in the Philippines, Colombia, and Kenya serve as exemplary models.
- **Empower Communities:** Integrate social safeguards in project design to protect and enhance community rights, knowledge, and leadership, ensuring fair and equitable benefit sharing.
- **Operate Locally and Contextually:** Align conservation efforts with local contexts, including cultural customs and resource management, while considering broader international trends.
- **Design for Sustainability:** Create sustainable mangrove projects that consider long-term viability, including financing, threat abatement, community stewardship, and climate resilience.
- **Mobilize High-Integrity Capital:** Ensure that capital flows are sufficient to support large-scale projects. Innovative financial tools like carbon credits and mangrove insurance are crucial for conservation success.
- **Expanding Protected Areas:** The Global Mangrove Alliance aims to halt mangrove loss, restore half of the world's lost mangroves, and double the protection of existing mangroves by 2030. Expanding legal protection for mangrove areas is vital, with a target to protect 80% by 2030.
- **Implementing OECMs:** Other Effective Area-Based Conservation Measures (OECMs) should be implemented, integrating biodiversity into sectors such as food and water security, even when conservation is not the primary objective.

- **Conclusion/Way Forward:**

- The "State of the World's Mangroves 2024" report underscores the urgent need for global action to protect and restore mangrove ecosystems. With climate change, human activities, and natural threats intensifying, it is imperative to adopt the recommended principles and expand conservation efforts. By leveraging scientific knowledge, empowering local communities, and securing sustainable financing, we can ensure the survival of these vital coastal ecosystems for future generations. The path forward requires a concerted effort from governments, corporations, and communities to safeguard mangroves, not just as an environmental necessity but as a legacy for global biodiversity and human well-being.

- ***Source → The Hindu***

2 - Genetic Testing in Sports: Unveiling Athletic Potential and Ethical Dilemmas:

GS II

Sports related issues:

- **Context/Why in News?**

- The application of genetic testing in sports is gaining momentum as athletes increasingly use it to enhance their performance in preparation for the 2024 Paris Olympics. This development has ignited debates regarding the advantages and ethical implications of genetic screening in athletics.

- **Introduction:**

- Genetic testing is revolutionizing the way athletes approach their training and performance. By analyzing an individual's DNA, scientists can identify genetic markers that may influence athletic capabilities. This technology, while promising, also raises important ethical concerns and questions about its impact on sports.

- **What is Genetic Testing?**

- **Overview**: Genetic testing involves examining an individual's DNA to identify genetic variations that may affect health, traits, and performance. It detects changes in chromosomes, genes, or proteins to confirm or exclude genetic conditions and predict the likelihood of developing or passing on genetic disorders. Testing can be performed on samples from blood, hair, skin, amniotic fluid, or other tissues.

- **Types of Genetic Testing**:

- **Cytogenetic Testing**: Analyzes entire chromosomes for structural abnormalities.
- **Biochemical Testing**: Measures the levels of proteins produced by genes.
- **Molecular Testing**: Detects small mutations in DNA.

- **Applications**:

- **Newborn Screening and Diagnostic Testing**: Conducted after birth to identify treatable genetic disorders. It helps confirm or rule out specific genetic conditions based on observable symptoms.

- **Carrier Testing**: Identifies individuals carrying one copy of a gene mutation that could cause a genetic disorder if present in two copies. This is particularly useful for those with a family history of genetic disorders or belonging to certain high-risk ethnic groups.
- **Preimplantation Testing (PGD)**: Used with in-vitro fertilization to test embryos for genetic changes before implantation, thereby reducing the risk of genetic disorders.
- **Forensic Testing**: Utilizes DNA sequences for legal purposes, such as identifying crime victims, suspects, or establishing biological relationships.

- **Understanding Genes, DNA, and Chromosomes:**

- **DNA**: A long molecule containing the genetic code. It consists of two strands that form a double helix structure, resembling a spiral staircase. DNA is made up of four basic building blocks: adenine (A), cytosine (C), guanine (G), and thymine (T).
- **Gene**: A section of DNA that contains instructions for producing specific proteins, which control various bodily functions and characteristics. Each cell contains two sets of genes, one inherited from each parent, organized into 46 chromosomes.
- **Chromosome**: Thread-like structures in the cell nucleus composed of DNA wrapped around proteins called histones. Chromosomes are not visible under a microscope in their natural state.

- **How is Genetic Testing Used to Improve Athlete's Performance?**

- **Identification of Genetic Markers**: Reveals specific markers associated with physical traits that contribute to athletic performance. For example, variations in the ACE (angiotensin-converting enzyme) gene are linked to endurance, while ACTN3 (alpha-actinin 3) gene variations are associated with strength.
- **Assessment of Muscle Fiber Composition**: The ACTN3 gene affects the proportion of fast-twitch muscle fibers, which are essential for explosive strength and sprinting. Genetic variants may indicate predispositions toward power sports or endurance activities.
- **Evaluation of Recovery and Injury Risk**: Identifies genetic predispositions to injuries or recovery times. Variations in genes related to collagen production, for instance, can suggest susceptibility to tendon and ligament injuries, allowing for preventive measures.
- **Nutritional Needs and Metabolism**: Genetic insights can guide dietary choices by identifying how well an athlete metabolizes nutrients, such as lactose intolerance or vitamin D metabolism, optimizing performance and health.
- **Psychological Traits**: Genetic variants may influence traits like motivation, stress response, and pain tolerance, impacting competitive success. Understanding these traits can aid in mental conditioning.
- **Tailored Training Programs**: Coaches can design personalized training regimens based on an athlete's genetic makeup, aligning with their strengths and weaknesses to enhance performance.

- **What are the Limitations of Genetic Testing?**

- **Scientific Uncertainty**: The link between genetics and athletic performance is complex and not fully understood, with many studies producing conflicting results.

- **Small Sample Sizes**: Limited sample sizes in genetic studies can affect the reliability and generalizability of findings across different populations and sports.
- **Overemphasis on Genetics**: Excessive focus on genetic factors can overshadow the importance of training, practice, nutrition, and psychological aspects in athletic success.
- **Ethical Concerns**: Privacy issues, potential discrimination, and misuse of genetic information pose significant ethical challenges.
- **Misinterpretation of Data**: Genetic data can be complex and may be misinterpreted without expert guidance, leading to incorrect conclusions about an athlete's potential.
- **Commercial Exploitation**: Direct-to-consumer genetic testing often prioritizes profit over scientific validity, raising concerns about result accuracy and testing motivations.

- **Way Forward:**

- **Independent Research**: Encourage comprehensive studies by independent scientific bodies to validate genetic influences and better understand gene interactions.
- **Education and Training**: Provide training for coaches and nutritionists to accurately interpret genetic data and apply it effectively in athlete development.
- **Ethical Guidelines**: Develop clear ethical guidelines to protect athletes' privacy and prevent discrimination based on genetic information, ensuring responsible data use.
- **Holistic Approach**: Integrate genetic insights with traditional training, nutrition, and psychological support, recognizing the interplay between genetics and environment.
- **Collaboration with Regulatory Bodies**: Work with sports organizations to establish policies governing the use of genetic testing, ensuring fairness and standardization.
- **Public Awareness Campaigns**: Educate athletes and the public about the benefits and limitations of genetic testing to promote informed decision-making.

- **Conclusion:**

- Genetic testing holds promise for enhancing athletic performance by providing valuable insights into individual capabilities. However, it is essential to balance these findings with traditional training methods and personal dedication to fully unlock an athlete's potential. Combining genetic insights with a comprehensive approach will ensure a fair, ethical, and effective application in sports.

- ***Source → The Hindu***

3 - Recent Developments in Governor Appointments:

GS II

Government Policies and Interventions:

- **Context/Why in News?**

- Recently, the President of India has appointed six new Governors and made changes to the roles of three existing Governors. This development highlights the dynamic nature of gubernatorial appointments and their impact on state governance.

- **Introduction:**

- The Governor serves as the chief executive head of an Indian state, a role that is pivotal in maintaining the balance of power between the central and state governments. The office of the Governor draws from the Canadian model, emphasizing a neutral stance in local politics. Understanding the appointment process, the constitutional provisions, and the privileges associated with the role is crucial for comprehending the broader framework of Indian federalism.

- **Appointment Process for the Governor:**

- **Role and Model**:

- The Governor acts as the chief executive head of the state.
- The office is modeled after the Canadian system.
- Conventionally, the Governor should not be from the state of appointment to avoid local political biases.

- **Appointment Procedure**:

- The President appoints the Governor by warrant under his hand and seal.
- Unlike the President, the Governor is not elected either directly or indirectly.
- The appointment is made based on the President's discretion, in consultation with the Chief Minister of the concerned state to ensure smooth functioning.
- The Governor holds office at the pleasure of the President and can be removed at any time. However, the Supreme Court's ruling in the Surya Narain v Union of India Case (1982) clarified that the President's pleasure is not justifiable.

- **Independence of Office**:

- Despite being a nominee of the Central government, the Supreme Court in Hargovind Pant Vs. Raghukul Tilak Case emphasized that the Governor's office is independent and not a Central government employment.

- **Conditions of the Governor's Office**

- **Residence and Emoluments**:

- The Governor is entitled to use the official residence (Raj Bhavan) without paying rent.
- Emoluments, allowances, and privileges are determined by Parliament.
- If a person serves as Governor for multiple states, the emoluments and allowances are apportioned as decided by the President.
- The Governor's salary and allowances cannot be reduced during their term.

- **Privileges**:

- **Immunity**:

- Under Article 361, the Governor enjoys personal immunity from legal liability for official acts.
- During their term, the Governor is immune from criminal proceedings related to personal acts.
- The Governor cannot be arrested or imprisoned. However, civil proceedings can be initiated after giving a two-month notice concerning personal acts.

- **Oath of Office**:

- Before assuming office, the Governor must take an oath or affirmation to:
- Faithfully execute the office.
- Preserve, protect, and defend the Constitution and laws.
- Devote to the service and well-being of the state's people.
- The Chief Justice of the concerned state High Court administers the oath, or the senior-most judge available in the absence of the Chief Justice.

- **Constitutional Provisions Related to the Governor**

- **Article 153**:

- Specifies that there must be a Governor for each state.
- A single individual can be appointed as the Governor of multiple states, as recommended by the Sarkaria Commission.

- **Articles 157 and 158**:

- Define the eligibility criteria for the role of Governor.

- **Article 163**:

- Establishes a Council of Ministers, headed by the Chief Minister, to aid and advise the Governor, with some discretionary powers allowed in certain conditions.

- **Conclusion/Way Forward:**

- The role of the Governor is integral to the Indian federal structure, balancing the interests of the central and state governments. The recent appointments and reshuffles reflect the ongoing adjustments within this framework. For UPSC aspirants, understanding these nuances not only helps in grasping the dynamics of Indian governance but also prepares them for questions related to constitutional roles and responsibilities. Staying updated on such appointments can provide deeper insights into the interplay of federal and state politics and governance.

- ***Source → The Hindu***

4 - India Elected as Vice-Chair of IPEF Supply Chain Council:

GS II

International Relations:

- **Context/Why in News?**

- India's recent election as Vice-Chair of the Supply Chain Council within the Indo-Pacific Economic Framework (IPEF) underscores its growing role in shaping regional economic and strategic partnerships. This development highlights India's influence in strengthening global supply chains and fostering economic resilience in the Indo-Pacific region. The IPEF, an initiative comprising 14 member countries, has established several key bodies to address critical economic and supply chain issues.

- **Introduction:**

- The Indo-Pacific Economic Framework (IPEF), inaugurated in May 2022 in Tokyo, Japan, aims to bolster economic cooperation and stability across the Indo-Pacific region. Comprising 14 countries, the IPEF focuses on advancing economic growth through four primary pillars: Fair and Resilient Trade, Supply Chain Resilience, Clean Economy, and Fair Economy. Recently, the IPEF's Supply Chain Council, one of its crucial bodies, elected India as its Vice-Chair, highlighting India's pivotal role in enhancing regional supply chain resilience.

- **What is the Supply Chain Council?**

- **Overview**: The Supply Chain Council is one of three specialized bodies created under the IPEF's Supply Chain Resilience Agreement. It focuses on enhancing the stability and efficiency of supply chains critical to national security, public health, and economic well-being.

- **Other Bodies Under IPEF**:

- **Crisis Response Network**: This body provides a platform for coordinated responses to urgent supply chain disruptions.
- **Labour Rights Advisory Board**: It brings together various stakeholders, including workers, employers, and governments, to improve labor rights and workforce development within regional supply chains.

- **Recent Appointments**:

- **Supply Chain Council**: USA (Chair) and India (Vice-Chair)
- **Crisis Response Network**: Republic of Korea (Chair) and Japan (Vice-Chair)
- **Labour Rights Advisory Board**: USA (Chair) and Fiji (Vice-Chair)

- **Significance of the Appointments:**

- **Enhanced Cooperation**: The first virtual meetings of the Supply Chain Council, Crisis Response Network, and Labour Rights Advisory Board mark a significant advancement in regional cooperation for supply chain resilience.

- **Future Plans**:

- **Supply Chain Council**: The Council has adopted its Terms of Reference and will discuss initial priorities at its upcoming in-person meeting in Washington, scheduled for September 2024, coinciding with the Supply Chain Summit.
- **Crisis Response Network**: The Network will focus on immediate and long-term strategies, including a tabletop exercise and its first in-person meeting at the Supply Chain Summit.
- **Labour Rights Advisory Board**: The Board will work on enhancing labor rights across IPEF supply chains and addressing labor provisions in the IPEF Clean Economy and Fair Economy Agreements.

- **What is IPEF?**

- **Formation and Objectives**: Launched in May 2022 in Tokyo, Japan, the IPEF aims to strengthen economic engagement among its 14 member countries. The framework seeks to foster economic stability and growth through its four main pillars:
- **Fair and Resilient Trade**: Promotes economic growth, peace, and prosperity.

- **Supply Chain Resilience**: Enhances the robustness and integration of supply chains.
- **Clean Economy**: Focuses on advancing clean energy and climate-friendly technologies.
- **Fair Economy**: Targets effective anti-corruption measures and tax policies.
- **India's Participation**: India is actively involved in Pillars II to IV of the IPEF and holds observer status in Pillar I.

- **Conclusion/Way Forward:**

- India's election as Vice-Chair of the Supply Chain Council reflects its strategic importance in the Indo-Pacific region and its commitment to improving regional economic and supply chain resilience. As the IPEF continues to evolve, India's role will be crucial in shaping effective responses to supply chain challenges and contributing to the overall economic stability of the region. The forthcoming in-person meetings and ongoing initiatives will provide opportunities for further collaboration and advancement in these areas, reinforcing India's position as a key player in regional economic dynamics.

- ***Source → The Hindu***