NEXT IAS

SUMMARY OF DOWN TO EARTH

[1–15 JANUARY, 2025]

DELHI CENTRE:

Vivekananda House: 6-B, Pusa Road, Metro Pillar no. 111, Near Karol Bagh Metro, New Delhi-110060 | Phone: 8081300200

Mukherjee Nagar: 1422, Main Mukherjee Nagar Road, Near Batra Cinema, New Delhi-110009 | Phone: 8081300200

JAIPUR CENTRE: A-1, Lion's Colony, Sitabari, Near The Theme Hotel, Tonk Road, Jaipur-302018 | Phone: 9358200511

PRAYAGRAJ CENTRE: 31/31 Sardar Patel Marg, Civil Lines, Prayagraj, Uttar Pradesh - 211001 | Phone: 9958857757

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CONTENT

[1–15 January, 2025]

Europe Faces Russian Natural Gas Supply Cuts

Context

- Recently, the Ukraine Prime Minister said that its gas transit agreement with Russia will expire on January 1, 2025, and will not be renewed.
    - The agreement was to allow transit of natural gas to Europe amid the Russia-Ukraine conflict.

More about the news

- For decades, Europe has relied heavily on Russian natural gas, with pipelines traversing Ukraine being a critical supply route.
- However, the ongoing conflict between Russia and Ukraine has led to a cessation of this vital energy flow.
- Ukraine's decision not to renew the transit agreement with Russia, which expires at the end of 2024, has effectively cut off a major source of natural gas to Europe.

Impact

- Countries such as **Austria, Slovakia and Moldova,** which are highly dependent on **Russia for energy**, fear the disruption of future supply.
- Before the invasion of Ukraine in 2022, Russia supplied about 35% of Europe's pipeline natural gas exports. This figure has now dwindled to less than 10%.
- **Moldova** imposed a **60-day emergency in the energy sector** over fears of natural gas supply cuts.
- **Slovakia** has rejected the EU's stance on moving away from Russian piped gas supply, saying it would result in high energy prices.
- The country has declared that it will block any sanctions on Russia related to nuclear energy.
    - Nuclear programmes in Slovakia are developed by Russia.

Geopolitical Ramifications

- Ukraine's move is seen as a strategic effort to weaken Russia financially by cutting off a major revenue stream.
- It aligns with broader European efforts to reduce dependency on Russian energy, a dependency that has been perceived as a tool for political leverage by Moscow.

Economic Consequences

- Russia stands to lose significant revenue from gas exports, which have been a cornerstone of its economy.
- On the other hand, European countries are likely to face higher energy prices and potential shortages, especially during the winter months.
- The transition to alternative energy sources will require substantial investment and time.

Postponement of Deforestation Law By European Parliament

Context

- In a significant move, the European Parliament has voted to postpone the implementation of the European Deforestation Regulation (EUDR) by one year.

Background and Purpose of European Deforestation Regulation (EUDR)

- The EUDR aims to ensure that products sold within the EU are not sourced from deforested land, addressing the urgent issues of climate change and biodiversity loss.
- It imposes supply chain due diligence requirements on operators and traders dealing with products linked to deforestation and forest degradation.

Reasons for Postponement

- The postponement comes in response to concerns from various stakeholders, including EU Member States, non-EU countries, traders, and operators, who indicated difficulties in fully complying with the rules by the original deadline.
- The European Council supported the above.

Proposed Amendments

- A new category of countries deemed to pose 'no risk' of deforestation was introduced.
- This category will have less stringent due diligence requirements, focusing mainly on compliance with the legislation of the country of production.
- The European Commission is tasked with finalizing the country benchmarking system by June 30, 2025.

Impact and Future Steps

- Despite the delay, the core substance of the deforestation law remains unchanged.
- The postponement is seen as a necessary step to ensure legal clarity and effective implementation of the regulation.
- Europe continues to lead in global forest protection efforts, with the next significant step being the publication of risk categories by country before June 2025.

Legalising Minimum Support Price (MSP)

Context

- Recently, a Parliamentary Standing Committee recommended implementing a legally-binding MSP in India, as farmers in northern states mounted multiple protests to demand for guaranteed MSP for crops.

About the Minimum Support Price (MSP)

- It has been a cornerstone of India's agricultural policy, aimed at ensuring farmers receive a fair price for their produce.
- However, the debate over legalising MSP has gained momentum, especially in light

of recent farmer protests and economic challenges.

Need for MSP

- Farmers in India face numerous challenges, including rising production costs, soil fertility loss, and insufficient irrigation.
- These factors, combined with market fluctuations and the necessity to sell crops to meet household expenses, often result in farmers receiving prices below their production costs.
- MSP aims to provide a safety net by guaranteeing a minimum price for certain crops, thus protecting farmers from market volatility.

Current MSP Framework

- The **Commission for Agricultural Costs and Prices (CACP)** recommends **MSPs for 23 commodities**, including cereals, pulses, oilseeds, and commercial crops.
- The Union Ministry of Tribal Affairs also provides **MSP for 87 minor forest produce**.
- However, the current MSP system is not legally binding, meaning there is no legal obligation for the government or private buyers to procure crops at MSP.

Arguments for Legalising MSP

- **Farmer Security:** Legalising MSP would provide farmers with a guaranteed income, reducing their vulnerability to market fluctuations and ensuring they can cover their production costs.
- **Market Stability:** A legally binding MSP could help stabilise market prices by setting a floor price, preventing prices from falling below a certain level.
- **Rural Economy Boost:** Ensuring fair prices for farmers can lead to increased rural incomes, boosting the overall rural economy and reducing poverty.

Challenges and Concerns

- **Fiscal Burden:** Implementing a legally binding MSP for all crops could impose a significant financial burden on the government.
    - Estimates suggest that procuring all MSP-covered crops could require up to ₹7.5 lakh crore annually.
- **Market Distortion:** A legally binding MSP could distort market dynamics, leading to overproduction of certain crops and underproduction of others, potentially affecting food security.
- **Implementation Complexity:** Ensuring compliance with a legally binding MSP would require robust monitoring and enforcement mechanisms, which could be challenging to implement.

Alternative Approaches

- **Private Sector Involvement:** One alternative is to legally obligate private buyers to purchase crops at or above MSP, similar to the current system for sugarcane procurement.
- **Direct Compensation:** Another approach is to provide direct compensation to

farmers if they sell their produce below MSP, reimbursing them for the difference.

- This method could be more cost-effective and easier to implement than direct procurement.

Conclusion

- Legalising MSP in India is a complex issue with significant implications for farmers, the economy, and the agricultural sector.
- While it offers potential benefits in terms of farmer security and market stability, it also poses challenges related to fiscal burden and market distortion.
- A balanced approach, involving stakeholder dialogue and exploring alternative mechanisms, is essential to address these challenges and ensure a sustainable and equitable agricultural system.

Electronic Waste in India

Context

- As per data shared by the Union Minister of State for Housing and Urban Affairs in the Rajya Sabha, India's electronic waste surged from 1.01 million tonnes in 2019-20 to 1.75 million tonnes in 2023-24.

About the Electronic Waste (or e-Waste)

- India is witnessing a rapid surge in electronic waste (e-waste) generation, driven by the increasing use of electronic devices. This rise poses significant environmental and health challenges, necessitating effective management strategies.

Current Scenario

- India's e-waste generation has surged by 73% over the past five years, reaching 1.75 million metric tonnes in 2023-24.
- The sharpest increase occurred during the COVID-19 pandemic, as remote work and learning boosted electronic consumption.
- E-waste contains hazardous materials like heavy metals and persistent organic pollutants, which can harm the environment and human health if not properly managed.

Environmental and Health Impacts

- E-waste contains hazardous substances such as lead, mercury, cadmium, and brominated flame retardants.
- When e-waste is not managed properly, these toxic substances can leach into the soil and water, causing contamination.
- Additionally, informal recycling practices, which are prevalent in India, expose workers to harmful chemicals, leading to serious health issues such as respiratory problems, skin diseases, and even cancer.

Government Initiatives and Regulations

- **E-Waste (Management) Rules, 2022:** These rules emphasize **Extended Producer Responsibility (EPR),** requiring producers to meet annual recycling targets based on the quantity of e-waste generated or products sold.

- Producers must purchase EPR certificates from registered recyclers, ensuring proper disposal and recycling of e-waste.
- **Extended Producer Responsibility (EPR)** is a key component of these rules, requiring manufacturers to establish e-waste collection centers and ensure environmentally sound recycling practices.

Role of the Informal Sector

- Informal recyclers often use rudimentary methods to extract valuable materials from e-waste, which can be hazardous.
- Efforts are being made to integrate the informal sector into the formal e-waste management system.
- Training programs and awareness campaigns are being conducted to educate informal workers about safe recycling practices and the importance of environmental protection.

Public Awareness and Participation

- Initiatives such as ***e-waste collection drives, awareness campaigns, and educational program***s are being organized to inform citizens about the importance of proper e-waste disposal.
- Consumers are encouraged to dispose of their electronic devices at authorized collection centers and participate in recycling programs.

Challenges and Solutions

- Despite these efforts, **over 95% of India's e-waste is handled by the informal sector,** which lacks the necessary infrastructure and expertise for safe recycling. This informal handling exacerbates environmental and health risks. To address this, there is a need for:
- **Strengthening Formal Recycling Infrastructure:** Investing in advanced recycling facilities and technologies to handle e-waste safely and efficiently.
- **Public Awareness Campaigns:** Educating consumers about the hazards of improper e-waste disposal and encouraging responsible recycling practices.
- **Incentivizing Formal Sector Participation:** Providing incentives for businesses and individuals to engage with formal recycling channels.

Shared Resources and India's Marginalised Communities

Context

- A landmark 2011 Supreme Court ruling to protect shared resources deepens struggles for India's marginalised communities.

About

- Shared resources, or commons, such as water bodies, forests, and grazing lands, play a crucial role in the livelihoods of India's marginalized communities.

- These resources are often the backbone of rural economies, providing essential goods and services to those who lack access to private property.
- However, the management and protection of these commons have been fraught with challenges, leading to conflicts and further marginalization of vulnerable groups.

Historical Context

- The concept of commons in India has deep historical roots, with traditional community-based management systems ensuring equitable access and sustainable use.
- However, colonial and post-colonial land policies disrupted these systems, leading to the privatization and commercialization of shared resources.
- This shift has often resulted in the exclusion of marginalized communities, such as Scheduled Castes (SCs), Scheduled Tribes (STs), and landless laborers, from accessing these vital resources.

Legal Framework and Challenges

- A landmark 2011 Supreme Court ruling aimed to protect shared resources and prevent their encroachment.
- The court mandated the eviction of illegal occupants and the restoration of commons, with exceptions for marginalized groups.
- Despite this, implementation has been inconsistent, and many marginalized communities continue to face eviction without adequate rehabilitation.

Case Study: Rohar Jagir Village

- In Rohar Jagir village, Punjab, the 2011 Supreme Court verdict has had limited impact.
- The village pond, a crucial resource, remains encroached upon, and the affected families, primarily from marginalized backgrounds, have not benefited from the ruling.
- This case highlights the systemic inequities and the gap between legal provisions and ground realities.

Impact on Marginalized Communities

- The misinterpretation and selective enforcement of legal protections for commons have disproportionately affected marginalized communities.
- Studies have shown that evictions often occur without prior notice or fair hearings, violating the rights of the affected individuals.
- Furthermore, the lack of regularization policies for indigent persons and SC/ST communities exacerbates their vulnerability.

Way Forward

- To address these challenges, it is essential to strengthen the legal and institutional frameworks governing shared resources.
- This includes ensuring transparent and participatory decision-making processes,

providing legal aid to marginalized communities, and implementing comprehensive rehabilitation and compensation schemes.

- Additionally, reviving traditional community-based management systems can promote sustainable and equitable use of commons.

'Nexus Assessment' and 'Transformative Change Assessment'

Context

- Recently, reports **'Nexus Assessment'** and **'Transformative Change Assessment'** from the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** have highlighted the urgent need for a unified approach to tackle the interconnected global crises of biodiversity, water, food, health, and climate change.

About the Nexus Assessment

- It focuses on the interlinkages among biodiversity, water, food, and health. It emphasizes that addressing these issues in isolation can lead to counterproductive outcomes.
- For instance, prioritizing food production without considering its impact on biodiversity and water resources can exacerbate environmental degradation. It recommended:
    - **Integrated Decision-Making:** Moving beyond single-issue silos to manage and govern the interconnected elements effectively.
    - **Adaptive Governance:** Implementing flexible policies that can adapt to changing circumstances and new scientific insights.
    - **Sustainable Practices:** Promoting practices that balance the needs of biodiversity, water, food, and health to achieve long-term sustainability.

Transformative Change Assessment

- It provides actionable solutions to halt biodiversity loss and achieve a sustainable future.
- It underscores the importance of transformative changes in policies, practices, and societal values to meet global biodiversity targets by 2050.

Key Aspects

- **Holistic Approaches:** Encouraging holistic approaches that consider the broader impacts of actions on biodiversity and ecosystem services.
- **Stakeholder Engagement:** Involving diverse stakeholders, including indigenous communities, in decision-making processes to ensure inclusive and effective solutions.
- **Policy Integration:** Integrating biodiversity conservation into broader policy frameworks, such as climate change

mitigation and sustainable development goals.

Additional Information

- **Earth Summit (1992):** The world agreed on the links between climate change, desertification and biodiversity loss, and resolved to protect nature.
  - Still, the planet has continued to lose an estimated 2-6% of its biodiversity every decade.
- **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES):** It is a Bonn-based intergovernmental body that assesses the state of the planet's biodiversity and ecosystems, and has looked for solutions to arrest this loss of biodiversity for the past three years.
- **Kunming-Montreal Global Biodiversity Framework (KMGBF):** It aims to reverse and halt biodiversity loss by 2030 recognises this and has identified IPLCs as crucial for meeting many of the targets.
  - At the recently held **COP16 of the Convention on Biological Diversity (CBD),** a new **Subsidiary Body on Article 8(j)** and Other Provisions of CBD related to indigenous peoples was established.
  - This would ensure that their views are included in the future policy decisions.
- **Biodiversity loss** — one of the crises that defines the polycrisis — has reached such a level that nature is no longer able to provide the services that ensure human survival.
  - Only 25% of the world's tropical rainforests, home to over 16,000 terrestrial mammals, bird, reptile and amphibian species, are of high quality.
  - IPBES also estimates that a million animal and plant species are threatened with extinction.
  - The first **'Global Tree Assessment'** published in an update of the **IUCN Red List** of Threatened Species, finds that one in three tree species faces extinction.

Burden of Poverty

Context

- According to the World Bank, poverty reduction has slowed amid poor economic growth and shocks like the covid-19 pandemic, high inflation, increased conflict and fragility.

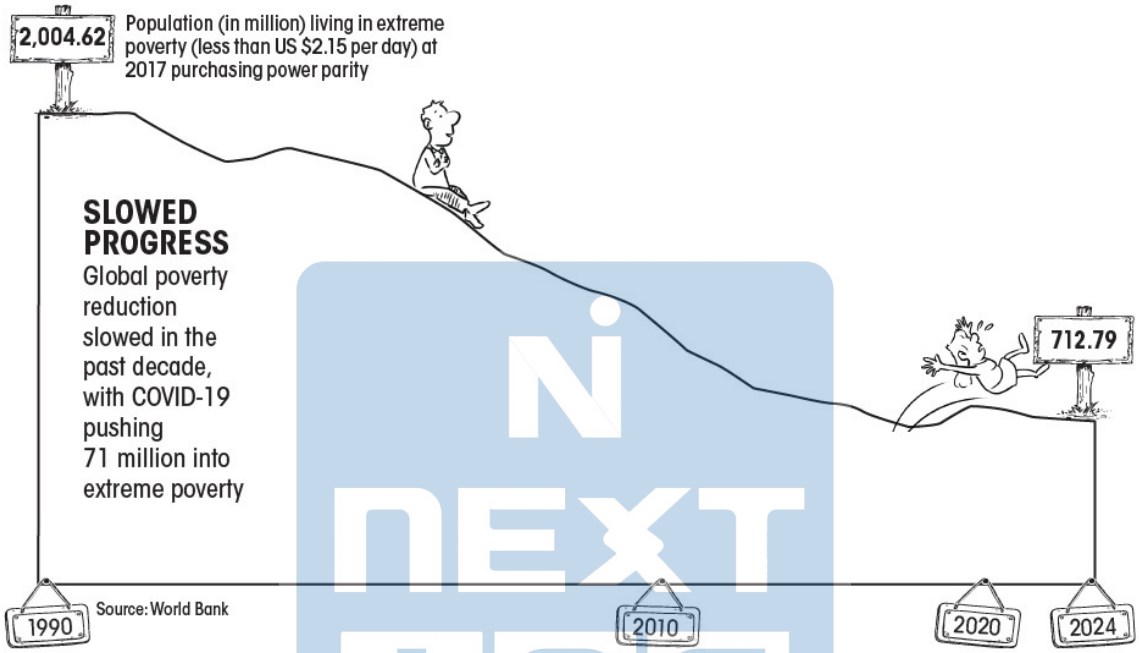
About

- Poverty remains one of the most pressing issues globally, affecting millions of lives and hindering sustainable development.
- Despite efforts to alleviate poverty, recent trends indicate a worrying rise in poverty

levels, exacerbated by economic shocks, conflicts, and climate change.

Current Trends

- According to the World Bank, as of 2024, approximately 700 million people, or 8.5% of the global population, live in extreme poverty, surviving on less than $2.15 per day.
- It has stagnated due to slow economic growth, the impacts of the COVID-19 pandemic, and increased fragility in many regions.



Regional Disparities

- Sub-Saharan Africa and South Asia are the most affected regions.
- In Sub-Saharan Africa, 67% of the population lives in extreme poverty, a figure that rises to 75% when including all fragile and conflict-affected countries.
- South Asia also saw a significant increase in poverty rates during the pandemic.

Income Inequality in India

- The richest 10% of the population now capture 52% of the national income, while the poorest half receive only 8.5%.
- This disparity has widened over the years, making it increasingly difficult for the poor to escape the cycle of poverty.
- The **World Inequality Lab** reports that the share of the top 10% in national income surged by 60% in recent years, compared to the 1990s.
    - Top 1% earning 23 times the average income in India.

Debt Distress

- More than half of low-income countries are facing debt distress, spending nearly 7.5% of their budgets on external debt servicing.

- This financial strain limits their ability to invest in welfare and development, pushing more people below the poverty line.

Impact of Climate Change

- Climate change is another factor contributing to the burden of poverty in India. Extreme weather events, such as floods and droughts, disproportionately affect the poor, who often lack the resources to recover from such shocks.
- The World Bank highlights that nearly one in five people globally are at risk of experiencing welfare losses due to extreme weather events.

Future Projections

- By 2030, the share of the global population living in extreme poverty is projected to decrease slightly to 7.3%, but in absolute numbers, the count of poor people will likely increase.
- It underscores the need for increased social spending and international cooperation to address the root causes of poverty.

Immigration and Depopulation

Context

- In recent years, the twin phenomena of immigration and depopulation have become central to discussions on global demographics and socio-economic policies.

About

- Immigration and depopulation are two interconnected phenomena that significantly impact global demographics.
- As fertility rates decline and populations age, many countries face the challenge of maintaining their population size and economic vitality.
- Immigration emerges as a crucial factor in addressing these demographic shifts.

Immigration Surge

- According to the **International Organization for Migration (IOM)**, there were approximately 281 million international migrants in 2020, a significant increase from previous decades.
- This surge is driven by various factors, including economic opportunities, political instability, and environmental changes.
- Countries like the United States, Germany, and Canada have seen substantial inflows of immigrants, which have contributed to their economic growth and cultural diversity.
- However, this influx has also sparked debates over national identity, resource allocation, and social integration.

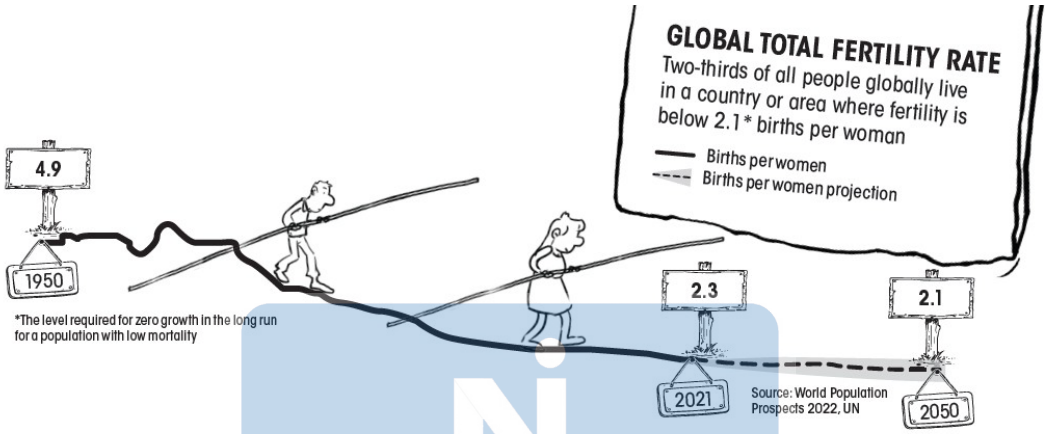
Depopulation Trends

- The **United Nations' World Population Prospects 2022** report highlights that 61 countries are projected to experience a population decline of 1% or more between 2022 and 2050.

- It is primarily due to low fertility rates and high emigration levels.

- Countries like Japan, Italy, and Russia are facing significant population declines, leading to challenges such as labor shortages, increased healthcare costs, and economic stagnation.

- These nations are implementing various policies to encourage higher birth rates and attract immigrants to mitigate the effects of depopulation.



Interplay Between Immigration and Depopulation

- **High-income countries** with declining populations often rely on immigrants to sustain their workforce and support their aging populations.
    - For instance, in the period from 2000 to 2020, international migration was a crucial factor in population growth in many developed nations.

- Conversely, **low and middle-income countries,** which continue to experience natural population growth, are often the source of emigrants seeking better opportunities abroad.
    - It creates a complex global landscape where migration patterns are influenced by economic disparities, demographic trends, and geopolitical factors.

Depopulation Trends

- Depopulation is a growing concern in many developed countries.

- The UN projects that by 2050, the population of developed regions will start to decline due to low fertility rates and an aging population.

- Without immigration, these regions would experience a significant reduction in population size, leading to potential economic and social challenges.

Immigration as a Solution

- Immigration can mitigate the effects of depopulation by replenishing the workforce and supporting economic growth.

- For instance, the **UN's medium-variant projection** suggests that continued immigration could help stabilize population sizes in developed regions.
- However, managing immigration effectively requires comprehensive policies that address integration, social cohesion, and economic opportunities for immigrants.

Challenges and Opportunities

- Countries must balance the benefits of immigration with the need to maintain social harmony and provide adequate resources for newcomers.
- Effective integration policies are essential to ensure that immigrants contribute positively to their new communities.

Policy Implications

- Countries must balance the need for economic growth and demographic stability with the challenges of social integration and resource management.
- Policies that promote inclusive growth, support family planning, and facilitate the integration of immigrants are essential.
- Moreover, international cooperation is crucial in addressing the root causes of migration, such as conflict, poverty, and climate change. By fostering global partnerships and sharing best practices, nations can create a more equitable and sustainable future.

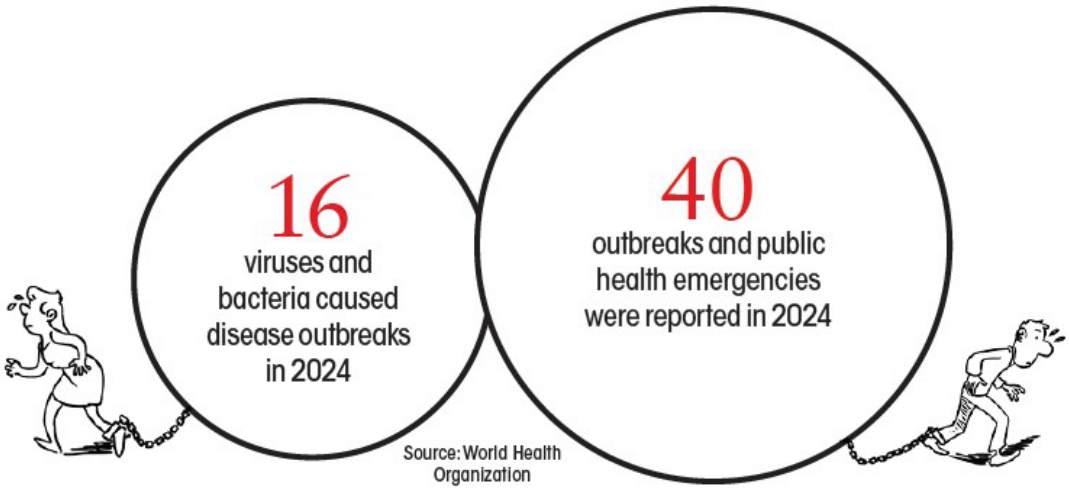
New Pathogens

Context

- The world faces an increasing threat from new and re-emerging pathogens. The **United Nations Environment Programme (UNEP)** has warned that the next pandemic could strike **by 2030** due to emerging zoonotic diseases.

Climate Change and Pathogen Spillover

- Climate change is a significant driver of pathogen spillover from animals to humans. Rising temperatures, deforestation, and habitat destruction are accelerating the spread of diseases.
    - For instance, the highly pathogenic **avian influenza (H5N1)** is just one mutation away from human-to-human transmission.
- Additionally, vector-borne diseases like dengue and chikungunya are spreading to new regions due to changing climate conditions.



Antimicrobial Resistance (AMR)

- The crisis of AMR is worsening, posing a grave threat to global health.
- The World Health Organization (WHO) has been negotiating the **International Treaty on Pandemic Prevention, Preparedness, and Response** since 2021, but significant gaps in collaboration and preparedness remain.
- In 2024, the UN approved a political declaration aimed at reducing the estimated 4.95 million human deaths linked to bacterial AMR.

Emerging and Re-emerging Diseases

- The year 2024 saw outbreaks of re-emerging and zoonotic diseases such as **cholera, M-pox, Marburg, and Oropouche fever.**
- In Africa, a more virulent form of **M-pox, Clade 1b**, spread rapidly, causing up to 50,000 cases and over 1,000 deaths.
- In Latin America, large outbreaks of vector-borne diseases were reported in new areas, with Brazil experiencing over 6 million suspected dengue cases.

New Pathogens in New Territories

- Known pathogens are infecting new species in new places and evolving to acquire newer transmission routes.
- For example, the highly infectious avian influenza strain H5N1 clade 2.3.4.4b reached the sub-Antarctic region by the end of 2023, killing penguins for the first time in January 2024.
- Additionally, a new COVID-19 variant, XEC, emerged in 2024, spreading to 27 countries.

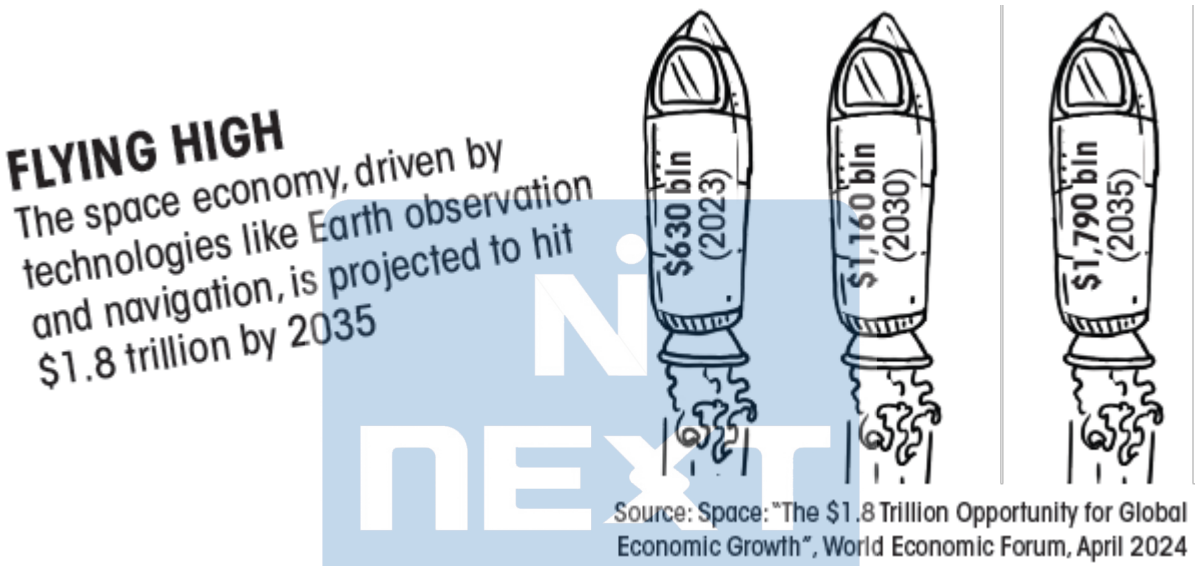
Space: New Marketplace

Context

- According to the World Economic Forum (WEF) and McKinsey & Company, Private players dominated the space economy, slated to be worth US $1.8 trillion by 2035 in 2024.

About

- The space industry is undergoing a remarkable transformation, evolving from a domain dominated by government agencies to a vibrant marketplace teeming with commercial opportunities.
- According to a recent report by the **World Economic Forum (WEF),** the global space economy is **projected to reach $1.8 trillion by 2035**, **up from $630 billion in 2023.**
- This shift, often **referred to as 'NewSpace'** is characterized by increased private sector participation, innovative technologies, and a growing array of applications that extend far beyond traditional space exploration.



Source: Space: "The $1.8 Trillion Opportunity for Global Economic Growth", World Economic Forum, April 2024

Rise of 'NewSpace'

- The term "NewSpace" encapsulates the burgeoning commercial space sector, which includes satellite communications, Earth observation, space tourism, and even asteroid mining. This new era is driven by several key factors:
- **Technological Advancements:** Innovations in satellite technology, miniaturization of electronics, and reusable launch vehicles have significantly reduced the cost of accessing space.
    - Companies like SpaceX and Blue Origin have pioneered reusable rockets, making space missions more affordable and frequent.
- **Private Sector Involvement:** The entry of private companies has revolutionized the space industry.
    - Firms such as SpaceX, OneWeb, and Planet Labs are leading the charge, offering services ranging from satellite internet to high-resolution Earth imaging.
    - This has opened up new revenue streams and business models.
- **Regulatory Reforms:** Governments worldwide are enacting policies to encourage private investment in space.

- In India, for instance, the government has introduced reforms to facilitate private sector participation, leading to a surge in space startups.

- **Venture Capital and Investment:** The space sector is attracting significant venture capital investment.
  - In India, the 2024-25 budget announced a ₹1,000 crore venture capital fund to boost the space economy.
  - This fund aims to support startups and small businesses, propelling the sector's growth fivefold over the next decade.

Applications and Opportunities

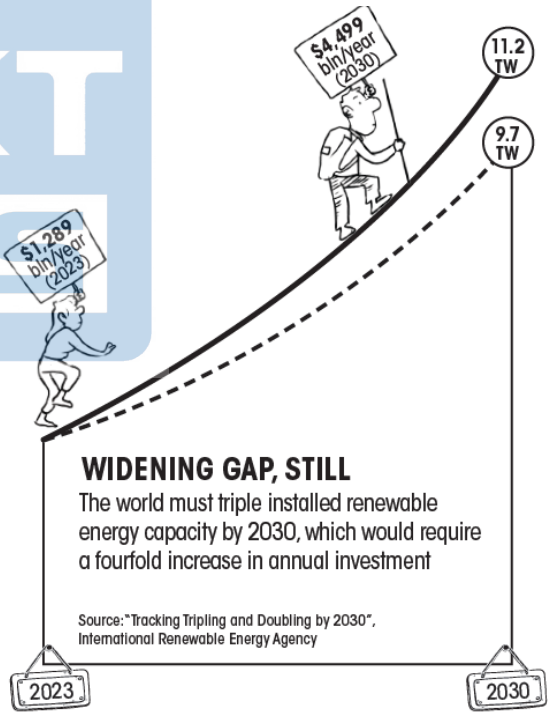
- **Satellite Communications:** Providing global internet coverage, enhancing telecommunications, and supporting remote sensing applications.
- **Earth Observation:** Offering critical data for agriculture, disaster management, environmental monitoring, and urban planning.
- **Space Tourism:** Companies like Virgin Galactic and Blue Origin are making space travel accessible to private individuals, heralding a new era of space tourism.
- **Asteroid Mining:** The potential to extract valuable minerals from asteroids presents a lucrative opportunity for future space missions.

Challenges and the Way Forward

- **Regulatory Hurdles:** Navigating the complex web of international and national regulations can be daunting for new entrants.
- **Sustainability:** Ensuring the long-term sustainability of space activities, including space debris management, is crucial.
- **Funding and Investment:** While venture capital is flowing into the sector, sustained investment is necessary to support long-term projects and innovations.

Our Last Chance

Context



- Recently, it is observed that the 16th of the last 17 months when global average surface air temperatures exceeded the warming limit of 1.5°C above pre-industrial levels, at 1.62°C above the pre-industrial level.

1.5°C Guardrail

- The **1.5°C target, set by the Paris Agreement**, is not just a number; it represents a threshold beyond which the impacts of climate change become increasingly catastrophic.
- Exceeding this limit could lead to more severe weather events, loss of biodiversity, and significant disruptions to human life. Despite this, current climate plans fall short.
- The latest nationally determined contributions (NDCs) are projected to result in greenhouse gas emissions of 51.5 gigatonnes of CO2 equivalent by 2030, only 2.6% lower than in 2019.

Path Forward: Renewable Energy and Energy Efficiency

- To stay within the 1.5°C limit, nations must triple their renewable power capacity and double energy efficiency by 2030. This ambitious goal requires a cumulative investment of $31.5 trillion.
    - While investments in solar photovoltaic are on track, other technologies remain underfunded.
- The **International Renewable Energy Agency (IRENA)** estimates that tripling renewable capacity will necessitate an average addition of 1,044 gigawatts annually from 2024 to 2030.

Challenges for Developing Countries

- Financial aid and technology transfer are crucial to enable these nations to transition to sustainable energy sources.
- The disparity in resources and capabilities between developed and developing countries must be addressed to ensure a global effort in combating climate change.

Role of International Cooperation

- The **COP28 in 2023** emphasized the need for enhanced international cooperation.
- Countries agreed to update their NDCs by February 2025, reflecting plans to significantly increase renewable energy capacity and improve energy efficiency.
- It is essential to meet the Paris Agreement's goals and secure a sustainable future.

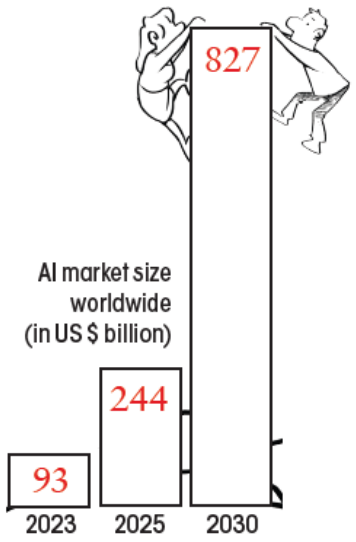
Evolution With Artificial Intelligence (AI)

Context

- AI's impact on various sectors continues to grow, bringing both opportunities and challenges.

Current Landscape of AI

- In 2024, AI advancements were recognized with Nobel Prizes in Physics and Chemistry, highlighting the technology's scientific significance.



MARKET BOOM
The global artificial intelligence market is projected to expand nearly eightfold from 2023 to 2030

- Investment in AI is projected to reach $200 billion globally by 2025, underscoring its economic importance.
- AI now features in nearly every technology we use, from automated teller machines to food delivery platforms to stock trading algorithms.
- However, AI also poses several concerns. The ability of AI systems to 'lie' and 'deceive' has raised alarms about fraud, election tampering, and loss of control over AI systems.
- In 2024 alone, over 30 AI-related lawsuits were filed, many concerning the use of copyrighted materials for training AI.
- The United Nations has also warned about the deployment of AI-based weapons in conflicts, prompting the adoption of a global resolution on AI to safeguard human rights.

AI and Human Evolution

- The integration of AI into our lives is not just a technological shift but also a potential driver of human evolution.
- An evolutionary biologist recently explored how AI might alter our physical, biological, and social environments, influencing natural selection.
    - For instance, AI's ability to capture user attention and influence behavior could have profound effects on social interactions and mental health.
- Predicting the exact impact of AI on human evolution is challenging. However, the relationship between humans and AI can be seen as a form of mutualism, where both species provide benefits to each other.
    - This dynamic could lead to significant changes in human traits and behaviors over time.

Future Trends and Ethical Considerations

- Looking ahead, several trends are expected to shape the AI landscape in 2025.
- Nations may begin discussions on the need for a treaty on AI, although achieving international consensus may prove difficult.
- The number of AI agents performing tasks autonomously is expected to double the workforce, with significant implications for employment and productivity.

- Ethical considerations will remain at the forefront of AI development.
- The 'Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence' in the US aims to establish new standards for AI safety and security, protect privacy, and promote innovation.
    - However, political changes could impact the implementation of such policies.

Treat of the Treaties

Context

- As 2025 begins, the world stands at a critical juncture, facing both significant challenges and opportunities.
- It is set to be transformative, with several landmark treaties and agreements poised to reshape global governance and address pressing issues such as climate change, health, and environmental sustainability.

Global Pandemic Treaty

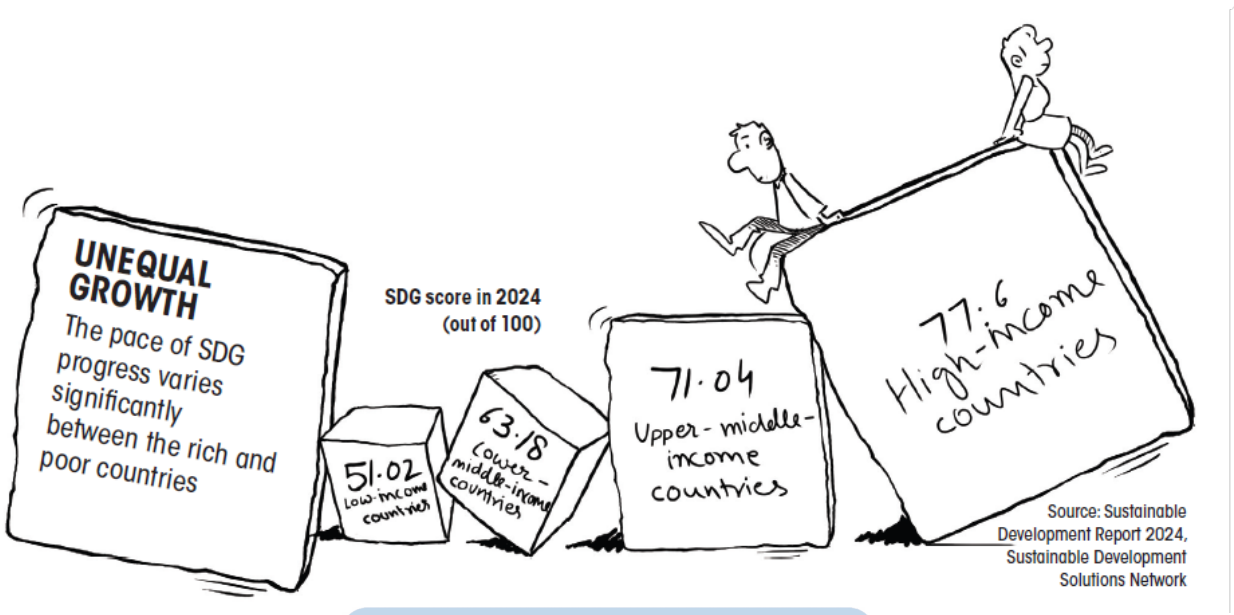
- It is expected to be finalized at the **78th WHO Health Assembly in Geneva.**
- It aims to address the weaknesses exposed by the COVID-19 pandemic by focusing on prevention, equity measures, health systems, financing, and governance.
- Its goal is to ensure equitable global health security and prevent future pandemics.

Plastics Treaty

- After missing its initial deadline in 2024, the world is now expected to finalize a plastics treaty later this year.
- While there is a consensus on the fundamental framework, disagreements persist between oil producers and other nations over whether the treaty should impose limits on plastics production or focus solely on waste management.

UN Environment Assembly

- The **7th session of the UN Environment Assembly (UNEA-7)** will take place in December 2025 under the **theme 'Advancing sustainable solutions for a resilient planet'.**
- This session will see the finalization of proposals by the Open-ended Working Group, established in 2022, to create a science-policy panel for the environmentally sound management of chemicals and waste.



Minamata Convention

- On April 25, amendments adopted at the **5th Conference of the Parties to the Minamata Convention (COP-5)** in 2023 will come into force.
- These amendments include the elimination of the mercury threshold in cosmetics and the **phasing out of mercury-added batteries, switches, and relays** by 2025.
    - COP-6 is scheduled for November 2025.

UN Ocean Conference

- Building on the success of previous conferences, the 3rd UN Ocean Conference in June will bring together UN member states and other stakeholders to advance **Sustainable Development Goal 14** on ocean protection.
- The conference will conclude with the adoption of voluntary commitments under the **Nice Ocean Action Plan.**

CITES Conference

- The **20th Conference of the Parties to the Convention on International Trade in Endangered Species (CITES)** will take place in Uzbekistan from November 24 to December 5, commemorating 50 years since the Convention's inception.
- This conference will address critical issues related to the trade in endangered species and biodiversity conservation.

Conclusion

- The treaties and agreements set to be finalized in 2025 represent a significant step towards addressing global challenges and achieving sustainable development.
- If successfully implemented, these treaties will play a crucial role in bringing balance to the planet and ensuring a resilient future for all.

On the Horizon

Context

- As we step into 2025, the global community is at a critical juncture in addressing environmental challenges, and highlights several key trends and initiatives that will shape our efforts towards a sustainable future.

Global Biodiversity Framework

- The **Kunming-Montreal Global Biodiversity Framework (December 2022)** sets an ambitious pathway to achieve a world living in harmony with nature by 2050.
- It includes four goals for 2050 and 23 targets for 2030, focusing on reducing threats to biodiversity, sustainable use, and benefit-sharing.
    - It has 23 targets for 2030 and 4 Goals for 2050.

Sustainable Development Goals (SDGs)

- The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, remains a cornerstone for global efforts.
- The 17 SDGs aim to end poverty, improve health and education, reduce inequality, and spur economic growth, all while tackling climate change and preserving oceans and forests.
    - It has 169 Targets under 17 Goals

International Trade in Endangered Species

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) aims to ensure that international trade in wild fauna and flora is legal and sustainable by 2030.
- It contributes to halting biodiversity loss and achieving the 2030 Agenda for Sustainable Development.
    - It has 1 target.

Montreal Protocol (1987)

- The Montreal Protocol targets the phase-out of ozone-depleting substances.
- By 2030, it aims to eliminate hydrochlorofluorocarbons (HCFCs), significantly contributing to the protection of the ozone layer.
    - It has 1 target.

Global Methane Pledge (2021)

- It commits 159 countries to collectively reduce methane emissions by at least 30% below 2020 levels by 2030.
- This initiative is crucial for mitigating climate change and improving air quality.
    - It has 1 target.

Combatting Desertification

- The **UN Convention to Combat Desertification (UNCCD)** aims to restore 1.5 billion hectares of degraded land by 2030.

- This target is part of a broader strategy to achieve land degradation neutrality and support sustainable land management.
    - It has 1 target.

Nutrition Targets

- The World Health Organization (WHO) has extended its nutrition targets to 2030, aiming to eliminate all forms of malnutrition and achieve universal coverage for essential nutrition services.
- This effort is vital for improving global health and well-being.
    - It has 6 targets.

India's Groundwater Recovery

Context

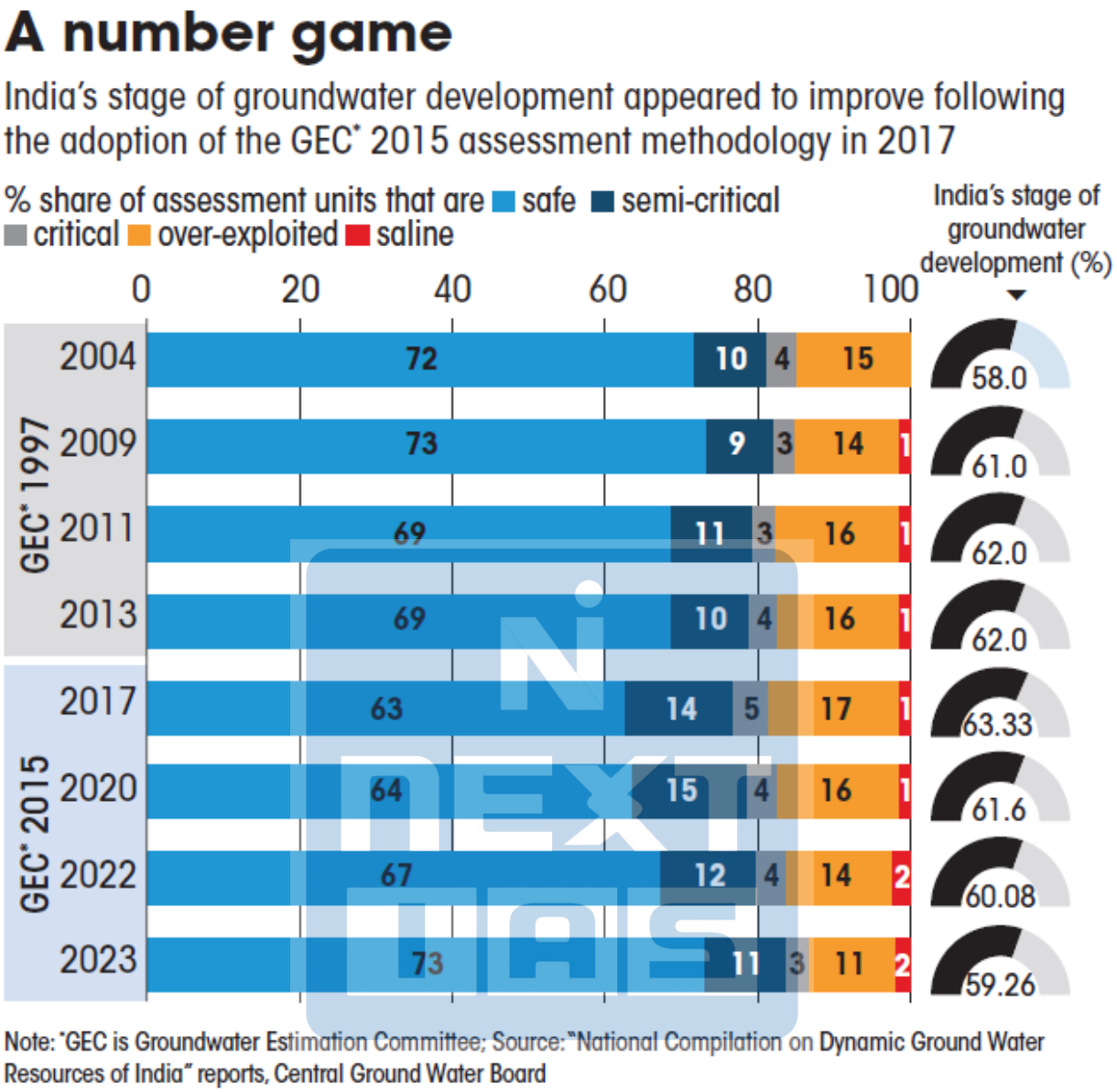
- Recent studies and reports highlight the urgent need for effective groundwater management and recovery strategies.

About

- India's groundwater resources are under severe stress due to over-extraction, urbanization, and climate change.
- Groundwater is a critical resource for agriculture, drinking water, and industrial use, but its unsustainable exploitation has led to alarming depletion rates.

Current State of Groundwater in India

- Groundwater depletion in India is a significant concern. A study published in Down to Earth indicates that the rate of groundwater depletion **could triple by 2041-2080 due to climate change.**
- This accelerated depletion is driven by increased irrigation demands as temperatures rise, despite potential increases in precipitation.
- The study emphasizes that **more than 60% of India's irrigated agriculture relies on groundwater,** making its sustainable management crucial for food and water security.



Factors Contributing to Groundwater Depletion

- **Agricultural Practices:** The Green Revolution led to increased agricultural productivity but also resulted in excessive groundwater extraction for irrigation.
    - Policies providing free or subsidized electricity for pumping groundwater have exacerbated the problem.
- **Urbanization and Industrialization:** Rapid urbanization and industrial growth have significantly impacted groundwater reserves.
    - Urbanization and industrial activities in states like Punjab, Haryana, Uttar Pradesh, West Bengal, and Kerala have led to substantial groundwater depletion.

- **Climate Change:** Rising temperatures increase crop water demand, leading to higher groundwater extraction.
    - Climate change projections suggest that this trend will continue, further stressing groundwater resources.

Efforts and Strategies for Groundwater Recovery

- **Regulating Groundwater Extraction:** Implementing stricter regulations on groundwater extraction, especially in over-exploited regions, is essential. This includes metering groundwater use and revising policies that encourage over-extraction.
- **Promoting Sustainable Agricultural Practices:** Encouraging farmers to adopt water-efficient irrigation techniques, such as drip and sprinkler systems, can significantly reduce groundwater use. Crop diversification and the cultivation of less water-intensive crops are also crucial.
- **Rainwater Harvesting and Recharge:** Enhancing rainwater harvesting and artificial recharge of aquifers can help replenish groundwater levels. Community-based initiatives and government programs should focus on constructing recharge structures and promoting water conservation practices.
- **Urban Water Management:** Urban planning should integrate sustainable water management practices, including the use of treated wastewater for non-potable purposes and the implementation of green infrastructure to enhance groundwater recharge.
- **Awareness and Education:** Raising awareness about the importance of groundwater conservation and educating communities on sustainable water use practices are vital for long-term groundwater management.

PRELIMS

Korku Language

Context

- Korku language makes education accessible for the tribal community in Madhya Pradesh and Maharashtra.

About the Korku Language

- It is an **Austroasiatic language**, spoken by the Korku tribal community primarily in the **central Indian states** of **Madhya Pradesh and Maharashtra.**
- It belongs to the Munda group, is the westernmost Austroasiatic language, making it unique in its geographical and cultural context.

Historical and Cultural Significance

- The Korku people have a rich cultural heritage, closely associated with the **Nihali people,** who traditionally lived in special quarters of Korku villages.
- The language is an integral part of their identity, reflecting their traditions, beliefs, and way of life.

Current Status and Challenges

- Despite its cultural significance, the Korku language is classified as "vulnerable" by UNESCO.
- The 2011 Indian census reported approximately 730,000 Korku speakers.
- However, the influence of dominant languages like Hindi has led to a decline in the use of Korku, especially among the younger generation.
- Literacy in Korku is low, and most adult men are bilingual or multilingual, often speaking Hindi and local Dravidian languages.

Rising cases of severe illness among humans

Context

- In recent years, the world has witnessed a troubling increase in severe illnesses among humans. This trend is driven by a combination of factors, including climate change, urbanization, deforestation, and the emergence of new pathogens.

Emerging Pathogens and Zoonotic Diseases

- According to a 2024 report by the **UN Environment Programme**, the **next pandemic could strike by 2030** due to emerging zoonotic diseases like the highly pathogenic avian influenza, H5N1.
- The report emphasizes that climate change accelerates the spillover of these diseases, with fatalities projected to be **12 times higher by 2050 than in 2020.**
- In 2024, the world saw outbreaks of re-emerging and zoonotic diseases such as **Cholera, M-pox, Marburg, and Oropouche fever.**
- These diseases are spreading rapidly due to factors like deforestation, urbanization, and habitat destruction, which bring humans into closer contact with wildlife.

Impact of Climate Change

- Increasing temperatures and changing precipitation patterns create favorable conditions for the spread of vector-borne diseases.
- For instance, Brazil reported over 6 million suspected dengue cases in 2024, the highest ever recorded.
- Similarly, dengue, a tropical disease, is now spreading across Europe, with the invasive mosquito species Aedes Albopictus establishing itself in 13 EU countries.

Antimicrobial Resistance

- The World Health Organization (WHO) has been negotiating the International Treaty on Pandemic Prevention, Preparedness, and Response since 2021, but significant gaps in collaboration and preparedness remain.
- In September 2024, the UN approved a political declaration aimed at reducing the 4.95 million estimated human deaths linked to bacterial AMR.

Regional Outbreaks and Public Health Responses

- In Africa, a more virulent form of M-pox, Clade 1b, has caused up to 50,000 cases and over 1,000 deaths since its detection in the Democratic Republic of Congo in September 2023. In Latin America, large outbreaks of vector-borne diseases like dengue, chikungunya, zika, and Oropouche fever are being reported in new areas.
- In North America, the highly pathogenic H5N1 influenza spread from poultry to dairy cows, affecting 16 US states and infecting at least 65 people by the end of 2024.
- It raises concerns about mutations and rapid adaptation of the virus.

Oil Spilled Into Black Sea

Context

- Vast amounts of oil spilled into the Black Sea after two tankers (Volgoneft-212 and Volgoneft-239) carrying fuel collided recently.

Catastrophic Oil Spill in the Black Sea

- The Black Sea is facing a severe environmental crisis after two Russian tankers sank in the Kerch Strait, releasing thousands of tonnes of fuel oil into the water.
    - **The Kerch Strait,** a crucial marine ecosystem connecting the Black Sea and the Azov Sea, is now at the center of this environmental disaster.
- It has exacerbated the ecological challenges in a region already struggling with the impacts of war and pollution.
- The **Black Sea** is bordered by **Bulgaria, Romania, Georgia, Moldova, Russia, Turkey and Ukraine.**

Environmental Impact

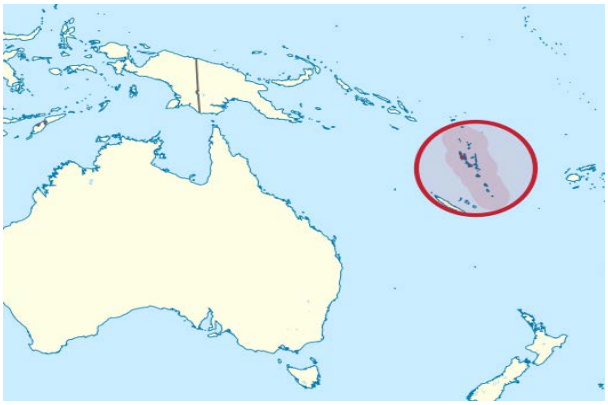
- The heavy fuel oil, or mazut, poses a significant threat as it does not float to the surface but sinks, affecting marine life at various depths.
- The region has a history of similar incidents, with a major spill in 2007 causing long-lasting damage.

Vanuatu Earthquake

Context

- Recently, **Efate, the main island of Vanuatu,** was hit by a 7.3-magnitude earthquake, killing at least 14 people and injuring 200 others.

Vanuatu Earthquake and Ring of Fire Connection



- Vanuatu is located within the **Pacific Ring of Fire,** ***a belt of tectonic activity that surrounds the Pacific Ocean.***

- This region is characterized by frequent earthquakes and volcanic eruptions due to the movement of tectonic plates.
- The **Pacific plate and the Australian plate** meet to the immediate **west of Vanuatu,** with the Australian Plate being subducted beneath the Pacific plate at a rate of about 80 to 90 millimeters per year.

Causes of Earthquakes in the Pacific Region

- The primary cause of earthquakes in the Pacific region is the interaction of tectonic plates.
- The Pacific Plate, one of the largest tectonic plates, is constantly moving and interacting with surrounding plates such as the North American Plate, the Eurasian Plate, and the Indo-Australian Plate.

Interactions

- **Subduction Zones:** In these areas, one tectonic plate is forced under another. This process generates significant seismic activity. Notable subduction zones in the Pacific include the Japan Trench and the Peru-Chile Trench.
- **Transform Boundaries:** Here, plates slide past each other horizontally. The San Andreas Fault in California is a well-known example of a transform boundary.
- **Divergent Boundaries:** At these boundaries, tectonic plates move away from each other, creating new crust. The East Pacific Rise is an example of a divergent boundary.

Siang Upper Multipurpose Project

Context

- Recently, villages in **Siang, Upper Siang and East Siang districts of Arunachal Pradesh** began protests against a 12-gigawatt hydropower project proposed on the Siang river.

About Siang Upper Multipurpose Project (SUMP)

- It is a proposed hydropower project on the Siang River in Arunachal Pradesh, India.
- It is designed **to generate 12.5 GW** of electricity, making it one of the largest hydropower projects in the world.
- The **Siang River, known as the Yarlung Tsangpo in Tibet**, flows into Arunachal Pradesh and later **becomes the Brahmaputra in Assam.**
- It aims to harness the river's potential to meet India's growing energy demands.

Strategic Importance

- One of the key motivations behind the SUMP is **to counter China's ambitious hydropower projects on the Yarlung Tsangpo,** including a proposed 60,000 MW 'super dam' in Tibet's Medog County.
- This project by China poses significant threats, such as flash floods and water scarcity, to downstream regions in India.
- The SUMP is seen as a strategic move to mitigate these risks and ensure water security for India.

African Swine Fever (ASF)

Context

- Recently, **Kerala** confirmed an outbreak of African Swine Fever (ASF) in pig farms in **Kottayam district**, placing several areas under surveillance.

About African Swine Fever (ASF)

- It is a highly contagious **viral disease** that affects domestic and wild pigs.
- With a near **100% mortality rate,** ASF has become a significant concern for pig farmers and the global pork industry.
- The disease, first reported in Kenya in 1921, has spread to 49 countries since January 2021, causing substantial economic losses and threatening food security.

Global Spread and Impact

- ASF has resulted in the loss of around 1.5 million animals since 2021, affecting more than 0.95 million pigs and over 28,000 wild boars.
- The highest losses have been reported in Europe, followed by Asia and Africa.
- The disease spreads through direct contact with infected animals, contaminated feed, and certain tick species.
- There is **no cure or vaccine for ASF,** making containment efforts crucial.

ASF in India

- India managed to avoid ASF for nearly a century, with the first case reported in 2020. The disease quickly spread across several states, including Assam, Manipur, Meghalaya, Mizoram, Nagaland, Arunachal Pradesh, and Sikkim.
- The outbreak in **Assam's bio-secure pig-breeding farm** and the **ICAR-National Research Centre on Pig** highlighted lapses in biosecurity measures.

SUBJECTIVE QUESTIONS

1. Critically analyze the arguments for and against legalizing the Minimum Support Price (MSP) in India. Discuss the potential economic, social, and political implications of such a policy change.
2. Critically analyze the current state of e-waste management in India, highlighting the challenges, environmental impacts, and potential solutions for a sustainable future. Discuss the role of government, industry, and citizens in mitigating the e-waste crisis.
3. Examine the concept of shared resources in India, focusing on its impact on the rights and livelihoods of marginalized communities. Provide specific examples to illustrate your points.
4. Discuss the multifaceted impact of poverty on individuals and society, extending beyond basic needs to encompass psychological, social, and developmental consequences.
5. Discuss the complex interplay between immigration and depopulation, analyzing how these phenomena can both exacerbate and mitigate each other's

effects on a nation's social, economic, and cultural fabric.

MCQs

1. The *'Extended Producer Responsibility (EPR)'* is the key component of which of the following rules:
   (a) Ozone Depleting Substances Rules, 2000
   (b) E-Waste (Management) Rules, 2022
   (c) Wetlands (Conservation and Management) Rules, 2010
   (d) The Environment (Protection) Rules, 1986

2. Recently, reports *'Nexus Assessment'* and *'Transformative Change Assessment'* are in news, released by:
   (a) United Nations Framework Convention on Climate Change (UNFCCC)
   (b) Intergovernmental Panel on Climate Change (IPCC)
   (c) Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
   (d) International Union for Conservation of Nature (IUCN)

3. *Korku language*, sometimes appeared in the news, is primarily spoken in:
   (a) Jharkhand
   (b) Odisha
   (c) Tamilnadu
   (d) Madhya Pradesh

4. Consider the following:
   1. Bulgaria
   2. Romania
   3. Georgia
   4. Moldova

   How many of the above countries are surrounded by the *Black sea*?
   (a) Only one
   (b) Only two
   (c) Only three
   (d) All fours

5. Recently, *Vanuatu* was hit by a 7.3-magnitude earthquake, killing at least 14 people and injuring 200 others. It is located in:
   (a) Pacific Ocean
   (b) Indian Ocean
   (c) Atlantic Ocean
   (d) Antarctic Ocean

Answer Key:_____

1. (b) 2. (c) 3. (d) 4. (d) 5. (a)

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