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BREAKING THE CHAINS: ENDING CHILD MARRIAGE IN INDIA

WHY IN THE NEWS?

The Union Minister for Women and Child Development, Smt. Annapurna Devi, recently launched the 'Bal Vivah Mukt Bharat' (Child Marriage Free India) campaign, marking a significant step toward eradicating child marriage and empowering young girls across the nation. As part of the initiative, a dedicated Child Marriage Free Bharat Portal was introduced to monitor and support efforts against child marriage. The event also included a nationwide pledge to combat this social issue and raise awareness about its harmful effects. This mission reflects the government's strong commitment to ensuring the safety, education, and well-being of every child in India.

CHILD MARRIAGE TRENDS IN INDIA

1. **Overall Decline in Child Marriage:** The prevalence of child marriage reduced from 47.4% in 2005–06 to 26.8% in 2015–16, registering a sharp decline of 21 percentage points in a decade. Between 2015–16 and 2019–21, child marriage further declined by 3.5 percentage points, reaching 23.3%.

2. **Age at Marriage:** The median age of first marriage for women (aged 20–49) increased from 17.2 years in 2005–06 to 19.2 years in 2019–21. For men (aged 25–29), the median age rose from 22.6 years to 24.9 years during the same period.

3. **Trends Among Younger Women:** Among women aged 18–19 years, the prevalence of child marriage declined from 37.7% in 2005–06 to 16.3% in 2019–21, indicating a continued downward trend.

4. **Socio-Economic and Educational Differentials**
Education: 48% of girls with no education were married before 18, compared to only 4% of girls with higher education. Each additional year of education increases the age at marriage by 0.36 years.

Economic Status: 40% of girls from the lowest wealth quintile were married before 18, while only 8% from the highest quintile faced the same fate.

Caste and Religion: Higher prevalence among Scheduled Castes (SC) and Scheduled Tribes (ST) (26%), though the gap is narrowing. Lower rates among Christians, Muslims, and other minority religious groups compared to Hindus.

5. **State-Wise Variations:** West Bengal, Bihar, and Tripura (over 40% of women aged 20–24 married before 18). Other states with a high prevalence of child marriages include Jharkhand, Assam, Andhra Pradesh, Rajasthan, and Telangana.

6. **Predictive Indicators:** Girls with lower education levels are 15.5 times more likely to marry before 18. Women from the poorest wealth quintile have 1.5 times higher odds of child marriage compared to the richest quintile. Rural residents and certain caste groups, such as Scheduled Tribes, face higher odds of child marriage.

GOVERNMENT INITIATIVES TO REDUCE CHILD MARRIAGES IN INDIA

Prohibition of Child Marriage Act, 2006: Strictly prohibits marriages involving girls below 18 years and boys below 21 years. Imposes severe penalties on violators and provides a legal framework to prevent and address cases of child marriage.

Sukanya Samriddhi Yojana: Encourage families to save for their daughters' education and future, reducing economic pressures that often lead to early marriages.

Child Marriage Free Bharat Campaign: Raise awareness, empower communities, and create a supportive ecosystem to eliminate child marriages.

Beti Bachao Beti Padhao (BBBP) Scheme: The Beti Bachao Beti Padhao (BBBP) scheme is a comprehensive initiative aimed at promoting gender equality, empowering girls, and tackling the issue of child marriage.

CHILDLINE (1098): It is the service that coordinates with local authorities, such as the police, Child Marriage Prohibition Officers (CMPOs), and District Child Protection

Units (DCPU), to respond swiftly and effectively to child marriage cases.

National Commission for Protection of Child Rights (NCPCR): The National Commission for Protection of Child Rights (NCPCR) plays an essential role in addressing the issue of child marriage through collaboration and advocacy.

Child Welfare Committees (CWC): They consist of representatives from the police, civil society organizations, and government agencies. They conduct awareness campaigns and encourage States/UTs to implement preventive actions, particularly during important cultural events like Akshay Tritiya.

Awareness Campaigns and Media Outreach: The government conducts regular awareness campaigns, media outreach, and community programs to inform the public about the dangers of child marriage and promote social change.

Stakeholder Collaboration and State-Level Coordination: To effectively combat child marriages, the government works in close collaboration with local governments, civil society organizations, and community leaders.

CAUSES OF CHILD MARRIAGES

1. Poverty
Economic Pressure: Poverty-stricken families marry off daughters early to reduce financial burdens or gain monetary benefits through dowries.

Mass Marriages: Economically weaker families organize mass marriages to minimize expenses, often resulting in child marriages.

Trafficking Risks: Some families, knowingly or unknowingly, marry off young daughters in exchange for money, leading to trafficking and exploitation.

2. Dowry System: The customary dowry practice compels families to marry daughters at a younger age, as younger brides often require lower dowries.

3. Patriarchy: Power Imbalance: Deeply entrenched patriarchal norms deprive women of decision-making rights, including their marriage. Male Domination: Marriage decisions, including timing and spouse selection, are often made by fathers or male elders, sidelining women's autonomy.

4. Sexuality and Virginity Concerns
Family Honor: The emphasis on preserving virginity and family honor prompts parents to marry daughters early.

Protection from Advances: Early marriage is seen as a safeguard against "improper" behavior or unwanted sexual advances.

Burden on Parents: Parents view daughters as a "burden" to be relieved through early marriage.

5. Cultural and Social Myths: Beliefs such as attaining salvation through early marriage or curing diseases (like AIDS) through intercourse with virgins perpetuate the practice.

6. Caste Hierarchy: Preservation of Caste: Child marriage ensures that individuals marry within their caste to uphold hereditary caste norms and avoid inter-caste unions.

IMPACTS OF CHILD MARRIAGES

Reproductive and Sexual Health Risks: Child brides face high rates of obstetric complications, such as pregnancy-induced hypertension and premature delivery. They are more likely to experience fetal wastage (miscarriages or stillbirths) and higher rates of maternal and infant mortality.

Maternal Mortality and Morbidity: Adolescent mothers are at double the risk of dying due to pregnancy-related complications. Frequent pregnancies, malnutrition, and lack of proper healthcare contribute to a high maternal mortality rate.

Infant Mortality and Morbidity: Infants born to adolescent mothers have a higher risk of premature birth, low birth weight, and poor growth. The Infant Mortality Rate (IMR) is significantly higher for adolescent mothers compared to adult mothers.

Limited Family Planning and Contraceptive Use: Contraceptive use is very low among adolescent mothers, leading to frequent pregnancies and related complications. Many young women face unmet contraceptive needs, resulting in unplanned pregnancies and unsafe abortions.

Lesser Autonomy for Girls: Child brides have less control over health, household decisions, and financial matters. They face restrictions on mobility and decision-making, impacting their ability to access healthcare and education.

Lack of Exposure and Information: Child brides are often isolated and lack access to important information about reproductive health and contraception. Many are not exposed to any form of media, further limiting their awareness of rights and available support.

Increased Susceptibility to Gender-Based Violence: Child brides are more likely to experience physical or sexual abuse. A significant number of young women justify abuse, and many are exposed to violence in their marriages.

Sexual Exploitation and Abuse: Early marriage exposes girls to sexual exploitation and abuse by their husbands and others in their marital homes. Child brides face increased health risks, including trauma from early sexual activity, pregnancy, and childbirth.

Child Trafficking: Child marriage is linked to trafficking, where young girls are sold or trafficked for sexual exploitation or bonded labor. In some regions, girls are married off young and then trafficked to other areas for forced prostitution or labor.

Social and Economic Disadvantages: Child marriages restrict girls' opportunities for education and economic independence. They are more likely to experience poverty, limited opportunities, and social exclusion throughout their lives.

Effective Ways to End Child Marriage in India:

Empower Girls with Education: Education empowers girls to break the cycle of child marriage. By providing access to quality education, girls gain the skills and confidence to make informed choices about their futures. Promote Gender Equality: Achieving gender equality is key to ending child marriage. Challenging harmful gender norms and stereotypes helps create a society where girls are valued equally to boys.

Encourage Supportive Laws and Child Protection Policies:

Strong legal frameworks and child protection policies are vital. Advocating for and enforcing laws against child marriage ensures that children's rights are upheld in practice.

Educate and Spread Awareness About Child Marriage: Awareness campaigns are essential to bring about change. Educating communities about the harmful effects of child marriage can encourage them to reject this practice.

Support the Development of Adolescent Girls: Focusing on the physical and emotional well-being of adolescent girls helps prevent child marriage. Programs aimed at their overall development equip them to make independent decisions.

Educate Parents About Child Marriage: Parents are often the decision-makers in child marriages. Workshops and awareness sessions for parents highlight the detrimental long-term effects of early marriage on their daughters.

Report Child Marriages: Community involvement is crucial in preventing child marriage. Reporting any incidents of child marriage ensures that authorities can intervene and take immediate action.

Refuse Participation in Events Promoting Child Marriage: It is important to stand against child marriage by refusing to take part in events that promote or support it. Every individual action counts towards eradicating this harmful practice.

Collaborate with NGOs to Prevent Child Marriage: NGOs play a vital role in preventing child marriage by providing resources, support, and guidance. Collaborating with such organizations strengthens efforts to create a safer environment for children.

Proactive Role of the Government: The government must enforce laws against child marriage, monitor age requirements, and conduct awareness campaigns. Programs like "Beti Bachao Beti Padhao" have been successful in raising awareness at the grassroots level.

CONCLUSION:

Child marriage is not only a barrier to a girl's dreams and aspirations but also a violation of fundamental human rights and constitutional principles. It is a crime against both the individual and society, hindering progress and development. In a progressing society like India, it is essential to eliminate child marriage, as it deprives

girls of their right to education, health, and empowerment. By ending this harmful practice, we can allow girls to reach their true economic, political, and social potential, contributing to the advancement of the nation as a whole.

PRELIMS QUESTION

Q. With reference to the legislation related to child marriages in India, consider the following statements:

1. Har Bilas Sarda is best known for the introduction of the Child Marriage Restraint Act (1929).

2. The Prohibition of Child Marriage Act, of 2006, allows for the nullification of child marriages and mandates the return of all valuables if a marriage is voided.

3. The Prohibition of Child Marriage (Amendment) Bill, 2021, seeks to equalize the marriage age for men and women by raising it to 21 years.

How many of the above statements are correct?

A. Only one

B. Only two

C. All three

D. None

ANSWER: C

MAINS QUESTION:

Assess the effectiveness of civil society organizations and charitable trusts in addressing the issue of child marriage in India. How do their interventions complement government efforts?

(Answer in 250 words)

INDIA AND BANGLADESH: A PARTNERSHIP FOR REGIONAL STABILITY

WHY IN THE NEWS?

Indian High Commissioner to Bangladesh, Pranay Verma, stated that India is committed to maintaining a stable, positive, and constructive relationship with Bangladesh, where the people of both nations are the primary beneficiaries. He made these remarks while discussing India-Bangladesh relations at the Bay of Bengal Conversation, an event organized by the Centre for Governance Studies in Dhaka.

INDIA-BANGLADESH COOPERATION:

1. **Defence Cooperation:** India and Bangladesh engage in joint military exercises like Sampriti and Maitree, enhancing border and maritime security, and counterterrorism efforts, particularly in the Bay of Bengal.

2. **Economic Cooperation:** India is one of Bangladesh's largest trading partners, with bilateral trade surpassing $18 billion in 2023. India exports machinery, chemicals, and agricultural products, while Bangladesh exports textiles and garments. India also invests in infrastructure and technology sectors.

3. **Strategic and Regional Cooperation:** India and Bangladesh collaborate in regional forums such as SAARC, BIMSTEC, and BBIN, focusing on South Asian stability, counterterrorism, and connectivity.

4. **Cultural Cooperation:** The two nations share cultural ties, marked by joint film festivals, academic exchanges, and commemorations of the 1971 Liberation War. Cultural diplomacy strengthens their historical and familial bonds.

5. **Technological and Scientific Cooperation:** India assists Bangladesh in space technology, biotechnology, and IT infrastructure, with collaborative projects in agriculture, healthcare, and disaster management, including support from ISRO.

6. **Energy Cooperation:** India exports 1,160 MW of electricity to Bangladesh and both countries explore renewable energy projects and strengthen gas pipeline connectivity.

7. **Connectivity and Infrastructure:** Key projects like the Akhaura-Agartala rail link and Mongla Port enhance cross-border transport, facilitating smoother trade and people movement.

SIGNIFICANCE OF BANGLADESH FOR INDIA:

1. **Important Trade Partners:** Bangladesh is India's largest trade partner in South Asia, while India stands as the second-largest trade partner of Bangladesh in Asia. In 2023-24, bilateral trade between the two countries reached USD 14.01 billion, reflecting the strong economic ties and growing trade relations between them.

2. **Security and Border Management:** India and Bangladesh collaborate closely on security issues, including police cooperation, anti-corruption efforts, and tackling illicit drug trafficking, fake currency, and human trafficking. They also work together to secure their 4,096 km border with initiatives such as border fencing and joint boundary pillar inspections, ensuring effective border management and enhancing security for both nations.

3. **Peaceful Resolution of Border Issues:** The Land Boundary Agreement (2015) and Maritime Boundary Delimitation exemplify the peaceful resolution of territorial disputes between the countries.

4. **Sub-Regional Cooperation:** Both countries share a common vision for the Indo-Pacific, focusing on maritime security and the development of the ocean economy.

5. **Multilateral Engagement:** India and Bangladesh actively engage in various multilateral platforms, such as SAARC, BIMSTEC, BBIN (Bangladesh, Bhutan, India, Nepal), and IORA.

6. **Enhanced Connectivity:** Initiatives like the Protocol on Inland Waterways Trade and Transit (PIWTT) and the use of Chittagong and Mongla Ports have significantly improved connectivity between the two countries.

7. **Cultural and People-to-People Relations:** The Indira Gandhi Cultural Centre and the Indian Cultural Centre in Dhaka play a key role in promoting the shared cultural heritage and strengthening people-to-people ties.

8. **Defence Cooperation:** Military exercises such as SAMPRITI and MILAN highlight the active defence cooperation between the two nations.

SIGNIFICANCE OF INDIA FOR BANGLADESH:

1. **Internal Connectivity:** India plays a key role in enhancing Bangladesh's internal connectivity, offering easier access to India's North-Eastern states. A prominent example is the Akhaura-Agartala cross-border rail link, which improves transportation and trade.

2. **Regional Integration:** Bangladesh is centrally located in India's strategic frameworks, including the Neighbourhood First Policy, Act East Policy, Vision SAGAR, and Indo-Pacific Vision, making it a key partner for regional integration.

3. **Support for India's Regional Leadership:** Bangladesh contributes to India's regional leadership vision by helping counter China's assertive presence in the region, fostering greater geopolitical balance.

4. **Developmental Partnership:** Over the past 8 years, India has extended nearly US$ 8 billion in Lines of Credit (LOC) to Bangladesh, supporting its infrastructure and development projects.

5. **Human Resource Development:** India provides training for Bangladesh's Civil Service and police officials, strengthening governance and institutional capacity in Bangladesh.

6. **Humanitarian Assistance and Disaster Relief (HADR):** India has been a key partner in humanitarian assistance, notably through initiatives like Vaccine Maitri, where India supplied COVID-19 vaccines to Bangladesh during the pandemic, demonstrating its commitment to regional welfare.

RECENT DEVELOPMENT CONSEQUENCE:

1. **Political Transition in Bangladesh:** Bangladesh's political uncertainty raises concerns about the future of ongoing projects. Despite this, India remains Bangladesh's key development partner, essential for economic stability and regional connectivity.

2. **Connectivity as a Cornerstone of Bilateral Ties:** Connectivity remains a critical component of India-Bangladesh relations, with key projects like the Akhaura-Agartala rail link, Bhutan rail connectivity, and energy initiatives such as the India-Bangladesh Friendship Pipeline strengthening their partnership.

3. **Trade and Energy Cooperation":** India is Bangladesh's largest trading partner, with established connectivity channels facilitating trade. Energy collaborations, such as the Maitree Thermal Power Plant and SASEC HVDC grid projects, support Bangladesh's energy security.

4. **Digital Connectivity and Future Plans:** The India-Bangladesh Digital Partnership aims to boost 4G/5G rollout and contribute to Bangladesh's Smart Bangladesh 2041 plan, enhancing digital infrastructure for economic growth.

5. **Resilience During Political Instability:** Despite the political upheaval, economic interdependence and established connectivity allowed for the swift reopening of the Petrapole-Benapole land port, ensuring a quick return to normalcy in trade.

6. **Need for Continuity in Bilateral Cooperation:** To maintain stability and growth, both countries must ensure the continuity of key projects like the BBIN Motor Vehicle Agreement and the Katihar-Parbatipur-Bornagar transmission line.

7. **India's Role in Regional Stability:** India's extensive connectivity initiatives help foster regional stability, supporting Bangladesh's goal to achieve developing country status by 2026, with India being a crucial development partner.

8. **Regional Integration through Connectivity:** Shared initiatives like BIMSTEC and BBIN are vital for enhancing trade, energy, and transport links across South Asia, and strengthening regional integration and stability.

WAY FORWARD:

1. **Sustaining Connectivity Projects:** Ensuring the timely completion and operationalization of ongoing projects such as the Akhaura-Agartala rail link and the Katihar-Parbatipur-Bornagar electricity transmission line will significantly enhance bilateral connectivity, trade, and regional integration.

2. **Strengthening Energy Cooperation:** Expanding energy projects, including the construction of the Rooppur Nuclear Plant and joint efforts to explore renewable energy, will further enhance Bangladesh's energy security and economic growth.

3. **Digital Partnership:** Prioritizing the India-Bangladesh Digital Partnership will allow both nations to leverage digital technologies for economic growth, improve cross-border data exchange, and support the development of Smart Bangladesh.

4. **Enhanced Multilateral Engagement:** Both nations should continue to work within regional frameworks like BIMSTEC and BBIN, ensuring stable regional security, connectivity, and prosperity and addressing challenges like counterterrorism and climate change.

5. **Human Resource and Disaster Management Cooperation:** Strengthening training programs for Bangladesh's civil service and police, alongside joint disaster relief efforts, will ensure effective governance and resilience during crises.

6. **Continuity in Development Partnership:** India should continue to play a key role in Bangladesh's development by extending further Lines of Credit (LOC), supporting infrastructure, and providing technical expertise across sectors like transport, healthcare, and agriculture.

CONCLUSION

India and Bangladesh share a dynamic, multifaceted relationship marked by strategic, economic, and cultural ties. Despite political transitions in Bangladesh, the strong connectivity, trade, and development cooperation between the two nations continue to serve as a pillar for stability in South Asia. The deepening of these partnerships, especially in energy, digital infrastructure, and regional cooperation, will be crucial in realizing the full potential of their bilateral and regional aspirations. Both countries must prioritize continuity in cooperation to ensure long-term growth, security, and regional stability.

PRELIMS QUESTION:

Q. With reference to India-Bangladesh relations, which of the following statements is/are correct?

1. India is Bangladesh's largest trading partner in South Asia, with bilateral trade reaching USD 14.01 billion in 2023-24.

2. India is not involved in any energy projects with Bangladesh, particularly in nuclear energy.

Select the correct answer using the code given below:

A. 1 only

B. 2 only

C. Both 1 and 2

D. Neither 1 nor 2

Answer: A

MAINS QUESTION:

Q. Despite political instability in Bangladesh, India has maintained a strong developmental partnership with the country. How have India's infrastructure, energy, and digital connectivity projects contributed to Bangladesh's economic stability and growth?

(250 words, 15 marks)

INDIAN PARLIAMENT THE TEMPLE OF DEMOCRACY

WHY IN THE NEWS?

In a breakthrough to end the logjam that had paralysed the Winter Session of Parliament, the government and the Opposition reached a consensus on holding a discussion on the Constitution in both Houses.

COMPOSITION OF INDIAN PARLIAMENT:

1. Lok Sabha (House of the People)
Composition: The Lok Sabha is the lower house of Parliament. It consists of:
545 Members (Maximum, as per the Constitution):

530 Members representing States.
13 Members representing Union Territories.
2 Members from the Anglo-Indian community (though this provision has been removed by the 104th Constitutional Amendment Act, 2019).
Members are directly elected by the people through general elections using a first-past-the-post system.
Term: Lok Sabha members serve for a 5-year term, after which fresh elections are held.
Presiding Officer: The Speaker, elected from among the members.

2. Rajya Sabha (Council of States)
Composition: The Rajya Sabha is the upper house of Parliament. It consists of:
245 Members (Maximum):
233 Members elected by the elected members of the State Legislative Assemblies and by members of the Legislative Assemblies of the Union Territories, through a single transferable vote.
12 Members were nominated by the President for their contributions to the arts, literature, science, and social services.
Term: Members of the Rajya Sabha are elected for a 6-year term. One-third of its members retire every two years, ensuring continuity.
Presiding Officer: The Vice President of India is the ex-officio Chairman of the Rajya Sabha. In his absence, a Deputy Chairman is elected.

3. President of India
Role: The President is the ceremonial head of state and is also an integral part of Parliament. The President is elected indirectly by the members of the Electoral College, consisting of the elected members of both Houses of Parliament and the elected members of the Legislative Assemblies of States and Union Territories.

SESSIONS OF PARLIAMENT:

1. Budget Session
The Budget Session is the longest and most significant of

the three, usually held from February to March. It begins with the President's Address and includes the presentation of the Union Budget in the Lok Sabha, followed by debates in both Houses.

Objective: The main goal is to discuss, debate, and approve the Union Budget, which outlines the government's fiscal policies and priorities for the upcoming year.

Activities: During this session, Members of Parliament (MPs) review the budgetary proposals, suggest amendments, and engage in discussions aimed at ensuring transparency and accountability in fund allocation. Other legislative work is also carried out during this time.

2. Monsoon Session

The Monsoon Session typically occurs between July and August, named after the monsoon season. This session primarily focuses on legislation, allowing MPs to introduce new bills, debate existing ones, and vote on their passage.

Objective: In addition to legislative functions, the Monsoon Session addresses various national issues, providing a platform for the government to present its views and for the opposition to raise concerns.

Activities: MPs debate and vote on proposed laws while also discussing national issues, often leading to extensive deliberations on pressing matters.

3. Winter Session

The Winter Session takes place between November and December, marking the final session of the calendar year. This session's primary focus is on reviewing and evaluating the government's policies and initiatives.

Objective: The Winter Session allows MPs to critically assess the government's performance and the effectiveness of its programs.

Activities: New bills are introduced, pending legislation is debated, and government policies are scrutinized through questions, motions, and debates.

4. Special Session

A Special Session is an exceptional event convened by the government outside the regular schedule to address urgent or significant issues. Although not specifically mentioned in the Constitution or Parliamentary rules, special sessions can be called to focus on a particular agenda or address critical national matters.

Objective: Special sessions often deal with specific events or urgent legislative needs, sometimes relating to national emergencies or important constitutional discussions.

Examples: In the past, special sessions have been convened for important events, such as the India-China war in 1962 or the India-Pakistan conflict in 1971.

IMPORTANCE OF PARLIAMENT'S SMOOTH FUNCTIONING:

1. **Law Making:** Parliament makes laws that affect everyone. When it works smoothly, laws are passed on time to address the country's needs and problems.

2. **Government Accountability:** Parliament holds the government accountable. MPs can ask questions, raise issues, and demand answers, ensuring the government works transparently and honestly.

3. **Representation of People:** Parliament is where the people's concerns are voiced. MPs represent different regions, and a functioning Parliament ensures all views are heard and considered in decision-making.

4. **Policy and Development:** Smooth functioning allows policies for national development—like education, health, and economy—to be discussed, decided, and implemented effectively.

5. **Crisis Management:** In times of crisis (like war or natural disasters), Parliament can quickly make important decisions, ensuring the country responds well.

6. **Checks and Balances:** Parliament ensures no branch of government becomes too powerful. It keeps the executive (government) in check, protecting democratic values.

7. **Public Trust:** When Parliament works well, people trust the system more. This leads to better participation in the democratic process.

8. **Economic Stability:** Parliament approves the Union Budget and economic policies. Delays can disrupt financial planning, affecting businesses and citizens

ISSUES WITH PARLIAMENT DISRUPTIONS:

1. **Controversial and Public Matters:** Disruptions typically occur when discussing sensitive topics like the Farm Bills, which generated intense debates and division among MPs, leading to disorder during

proceedings. The contentious nature of the Bills, particularly related to agricultural reforms, sparked widespread protests and opposition, further escalating tensions in Parliament.

2. **Avoiding Accountability:** The highest number of disruptions take place during Question Hour and Zero Hour when MPs ask questions directly to the government. While these disruptions are often blamed on the opposition, they can also be a strategy by the ruling party to avoid difficult questions or accountability.

3. **Insufficient Time for Unlisted Issues:** Disruptions are sometimes caused by the lack of sufficient time to discuss matters not officially listed for the day's agenda. MPs may resort to raising these unlisted issues, resulting in disruptions due to the absence of formal platforms to address them.

4. **Infrequent Use of Disciplinary Actions:** The Speaker of the Lok Sabha and the Chairman of the Rajya Sabha have the authority to maintain order, but they rarely enforce disciplinary actions. This failure to apply consequences for disruptive behaviour encourages MPs to continue such actions without fear of punishment.

5. **Historical and Systemic Factors:** A 2001 conference in Parliament identified several long-standing factors contributing to disruptions. MPs often feel frustrated by the limited time available to voice their concerns, which leads to dissatisfaction. The government's unresponsive attitude, coupled with the confrontational approach of the ruling party, intensifies these tensions.

6. **Party Politics:** When sensitive issues arise, the government may hesitate to debate them, prompting the opposition to disrupt parliamentary proceedings in protest. Since opposition members are usually backed by their parties in these actions, the threat of suspension or other disciplinary measures fails to deter them.

IMPACTS OF PARLIAMENT DISRUPTIONS:

1. **Legislative Backlog:** Ongoing disruptions in Parliament have delayed the passage of critical legislation, hampering effective governance and postponing essential reforms. This impacts public welfare by preventing the timely implementation of key policies related to health, security, and economic growth.

2. **Public Perception:** Continuous disruptions have eroded public trust, as citizens expect elected representatives to address national issues. The focus on protests and disorderly conduct suggests that MPs prioritize political games over meaningful legislative work, diminishing faith in Parliament's functionality.

3. **Economic Consequences:** Delays in vital economic legislation create uncertainty for businesses and investors. The stalling of important reforms can slow growth, hinder job creation, and negatively impact market confidence, further delaying necessary investments in infrastructure and development.

4. **Weakening of Democratic Accountability:** Frequent disruptions prevent crucial debates and scrutiny, undermining Parliament's role in holding the government accountable. Without these checks, transparency suffers, and the quality of governance declines, leaving citizens dissatisfied with the political process.

5. **Erosion of Political Engagement:** The persistent chaos in Parliament can lead to voter apathy, as citizens become disillusioned with the political process. When legislative bodies fail to function effectively, public interest in politics wanes, resulting in lower voter turnout and diminished civic engagement, ultimately threatening the health of democracy.

WAY FORWARD:

1. **Promote Constructive Dialogue:** Both government and opposition should engage in meaningful discussions instead of resorting to protests and disruptions. This would foster cooperation and resolve contentious issues through dialogue, ensuring smoother parliamentary proceedings.

2. **Enforce Stronger Disciplinary Measures:** The Speaker and Chairman should strictly enforce rules to discourage disruptive behaviour. Effective consequences for unruly conduct would deter MPs from engaging in disorderly actions, helping maintain order and discipline.

3. **Allocate Time for Critical Issues:** Parliament should ensure adequate time is given to discuss unlisted but significant matters. This will allow MPs to address urgent concerns without resorting to disruptions, ensuring all voices are heard.

4. **4. Strengthen Parliamentary Accountability:** Both the ruling party and opposition must be held accountable for their actions in Parliament. Transparent processes to address grievances and criticism will help rebuild trust in parliamentary procedures and enhance responsiveness.

5. **Reform Parliamentary Procedures:** Efficient scheduling and the use of technology can streamline legislative debates. Reforms that enable timely scrutiny of bills and reduce delays will help Parliament function more effectively.

6. **Engage the Public:** Rebuilding public trust requires Parliament to prioritize the needs and concerns of citizens. Transparency in decision-making, outreach initiatives, and engaging citizens in the legislative process will strengthen democracy and encourage greater political participation.

CONCLUSION

The smooth functioning of Parliament is crucial for a thriving democracy. Disruptions not only impede legislative progress but also harm the relationship between MPs and the public, undermining trust in democratic institutions. To move forward, Parliament must prioritize dialogue over conflict, enhance accountability mechanisms, and implement reforms that make the legislative process more efficient and transparent. This will enable it to fulfil its role of lawmaking, representing the people, and holding the government accountable, thereby contributing to national development and democratic stability.

PRELIMS QUESTION:

Q. With reference to the powers of the Indian Parliament, consider the following statements:

1. The Parliament of India has the power to amend the Constitution under Article 368, but only with the approval of the President.

2. The Rajya Sabha can initiate and amend Money Bills.

3. A bill passed by both Houses of Parliament must receive the President's assent to become a law, but the President can withhold assent to any bill.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: A

MAINS QUESTION:

Q. Discuss the role of the Rajya Sabha in the Indian parliamentary system. How does its composition and powers differ from those of the Lok Sabha, and what impact does this have on the legislative process in India?

(250 words, 15 marks)

FISHERIES IN INDIA: A LIFELINE FOR INDIAN ECONOMY

WHY IN THE NEWS?

The Pradhan Mantri Matsya Sampada Yojana (PMMSY) is being implemented across all States and Union Territories (UTs) in India for a five-year period, from FY 2020-21 to FY 2024-25. Under this scheme, the Department of Fisheries (DoF), Government of India, has approved fisheries development projects submitted by the Union Territory of Dadra and Nagar Haveli and Daman and Diu, with a total investment of Rs. 135.17 crore for the period from 2020-21 to 2024-25. The approved activities include the construction of rearing and grow-out ponds, ornamental fish-rearing units, cold storage facilities, the establishment of a brood bank for seaweed, fish value-added enterprises, transport vehicles, and freshwater aquaculture initiatives. Additionally, the scheme includes the development of a smart and integrated fishing harbour at Vanakbara in Diu.

FISHERY SECTOR IN INDIA:

Category	Details
1. GDP Contribution	The Fisheries sector contributes approximately 1.09% to India's total Gross Value Added (GVA) at constant prices in 2022-23, amounting to Rs. 1,37,716 Crores.
2. Employment	The Fisheries sector provides livelihood to about 16 million fishers and fish farmers at the primary level, with additional employment along the value chain.
3. Contribution to Agricultural GVA	Fisheries contribute around 6.72% of the total agricultural GVA.
4. Inland Fisheries	75% of the total fish production in India comes from the Inland Fisheries sector.
5. Marine Fisheries	25% of the total fish production comes from the Marine Fisheries sector.
6. Important Species	Major fish species include Shrimps, Prawns, Sea Bass, Pearl Spot, Groupers, carp, and Ornamental Fish. Aquaculture of high-value species like Rainbow Trout is also a significant focus.
7. Top States	West Bengal, Tamil Nadu, Andhra Pradesh, Odisha, and Kerala are the top states contributing to fish production, especially in Inland and Marine fisheries.
8. India's Rank in the World	India is the third-largest fish-producing country in the world and ranks second globally in fish production through aquaculture, just after China.

Ministry of Electronics & Information Technology, Government of India — Digital India, Power To Empower — PLUTUS IAS UPSC/ PCS

#AatmaNirbharBihar

Pradhan Mantri Matsya Sampada Yojana launched by Hon'ble Prime Minister Narendra Modi

- ✓ PMMSY will transform the fisheries sector
- ✓ This scheme brings with it highest investments worth Rs. 20,050 crores in the fisheries sector
- ✓ To add strength to the efforts of building an Aatmanirbhar Bharat
- ✓ Infuse the sector with latest technology with focus on value addition
- ✓ Upgradation of critical infrastructure
- ✓ Boost welfare of those associated with fishing

GOVERNMENT SCHEMES/POLICIES:

1. **National Surveillance Programme on Aquatic Animal Diseases (NSPAAD):** Monitor and manage aquatic animal diseases for biosecurity and export certification. Disease surveillance, diagnostics, and quarantine facilities across 59 centres.

2. **Directorate of Aquatic Animal Health and Quarantine (DAAHQ):** Strengthen quarantine and disease diagnostics for aquaculture. New quarantine units and diagnostic labs at key ports (Chennai, Mumbai).

3. **Pradhan Mantri Matsya Sampada Yojana (PMMSY):** Enhance fish production, infrastructure, and livelihoods. Expansion of inland and brackish water aquaculture, seaweed farming, cold-water fisheries, and modernization of markets and infrastructure.

4. **Tilapia Culture Promotion:** Promote high-yield, sustainable tilapia farming. Focus on closed water bodies and genetic improvement programs to increase tilapia production.

5. **Scampi Culture Promotion:** Boost scampi farming with high-quality seed production. Genetic improvement and enhanced scampi seed production through hatcheries.

6. **Fish Farmer Producer Organizations (FFPOs):** Empower fish farmers through collective organizations.

PLUTUS IAS UPSC/ PCS

Formation of 720 FFPOs to enhance economic outcomes for farmers.

7. Group Accidental Insurance Scheme (GAIS): Provide insurance coverage for fishers. Coverage for accidental death, disability, and hospitalization.

8. Saving Cum Relief Fund: Support fishers during fishing bans and lean periods. Financial aid of Rs. 4,500 per family to help during lean seasons.

9. **Sea Cage Culture Development:** Promote fish farming in reservoirs through cage culture. Installation of 20,000 cages to produce 60,000 MT of fish.

FISHERY SECTOR IS A LIFELINE FOR THE INDIAN ECONOMY:

1. Economic Contribution: It plays a key role in GDP, providing protein and driving foreign exchange through exports.

2. Employment Generation: Over 14 million people are employed in fishing and aquaculture, supporting coastal and rural communities.

3. Women Empowerment: Women are central in fish processing and marketing, gaining financial independence and skills.

4. Sustainable Development: Focus on responsible fishing and aquaculture practices ensures environmental sustainability.

5. Cooperative Federalism: Central and state governments collaborate to implement schemes like PMMSY, boosting fish production and infrastructure.

6. Alternate Source of Income: It provides economic stability, especially in rural areas with limited agricultural options.

7. Marine Fish Exports: India is a leading exporter of seafood, particularly shrimp, contributing significantly to foreign exchange and global trade.

CHALLENGES:

1. **Lack of Organized Sector:** The sector remains largely unorganized, making it difficult to implement standards, quality control, and efficiency.

2. **Climate Change:** Rising temperatures, altered rainfall patterns, and extreme weather events affect fish habitats, breeding cycles, and overall productivity.

3. **Poor Infrastructure:** Inadequate cold storage, transportation, and fishing harbour facilities hinder efficient production and reduce export potential.

4. **Disputes with Neighboring Countries:** Tensions between India and Sri Lanka, particularly over fishing rights in the Palk Strait, disrupt fishing activities and trade.

5. **Less Competitive in Global Market:** India faces stiff competition from countries like Japan and China, which have more advanced technology, better practices, and economies of scale in aquaculture.

6. **Fragmented Approach:** State-level initiatives often lack coordination, leading to inconsistent implementation of policies and fragmented development across regions.

7. **Lack of Credit Availability:** Small-scale fish farmers struggle to access affordable credit, limiting their ability to invest in technology, infrastructure, and sustainable practices.

WAY FORWARD:

1. **Fisheries Cooperatives:** Encourage the establishment of cooperative models, similar to Maharashtra, to improve collective bargaining power, access to resources, and sustainable practices.

2. **Increased Credit Access through KCC:** Provide more financial support to fish farmers through the Kisan Credit Card (KCC) scheme to enhance their investment capabilities.

3. **Sustainable Fishing Practices:** Promote environmentally friendly and resource-efficient fishing techniques to ensure long-term sustainability and reduce environmental impact.

4. **Improved Storage and Cold Chain Infrastructure:** Expand cold storage and warehousing facilities through initiatives like the Pradhan Mantri Matsya Sampada Yojana (PMMSY) to reduce post-harvest losses.

5. **Adoption of Best Practices from Japan:** Learn from Japan's advanced aquaculture techniques, including technology adoption and better management practices, to boost productivity and quality.

6. **Resolve Fishing Rights Disputes:** Address and resolve fishing rights disputes with Sri Lanka to ensure peaceful and productive cooperation in shared maritime zones.

7. **Exploring Lakshadweep's Potential:** Unlock the untapped aquaculture potential of Lakshadweep to develop new marine fisheries and expand the nation's fishing capacity.

CONCLUSION

The Indian fishery sector holds immense potential for economic growth, employment generation, and sustainable development. The implementation of government schemes like PMMSY is a step in the right direction, addressing infrastructure gaps, promoting sustainable practices, and enhancing the livelihoods of millions involved in the sector. However, challenges like climate change, inadequate infrastructure, disputes with neighbouring countries, and lack of access to credit need urgent attention. A coordinated, forward-looking approach that includes the promotion of fisheries cooperatives, improved access to credit, sustainable fishing practices, and better infrastructure will ensure the sector's growth and global competitiveness.

PRELIMS QUESTION:

Q. With reference to the Pradhan Mantri Matsya Sampada Yojana (PMMSY), consider the following statements:

1. The scheme aims to enhance fish production, infrastructure, and livelihoods for the period from 2020-21 to 2024-25.

2. It includes the construction of cold storage facilities for fish crops and promoting seaweed farming.

3. The scheme is being implemented only in coastal states and Union Territories.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: B

MAINS QUESTION:

Q. Discuss the importance of the fisheries sector in India's economy. What are the key challenges it faces, and how can the government address them to ensure its sustainable growth?

(250 words, 15 marks)

FOURTH GLOBAL CORAL BLEACHING EVENT

WHY IN THE NEWS?

In India, the Fourth Global Coral Bleaching Event (GCBE4) has affected areas including the Andaman and Nicobar Islands, the Gulf of Mannar, Lakshadweep, and the Gulf of Kachchh.
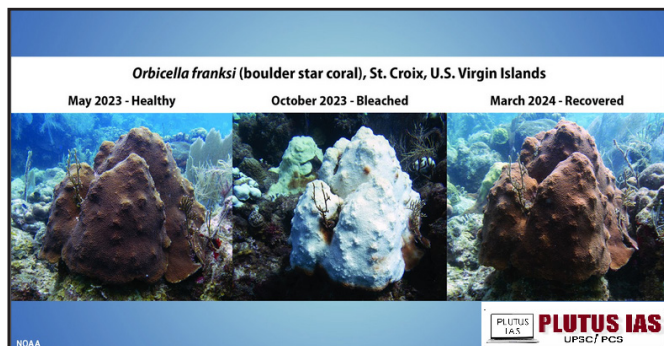
WHAT ARE CORALS?

Corals are marine invertebrates belonging to the phylum Cnidaria, which also includes jellyfish and sea anemones. They are mostly found in warm, shallow ocean waters and play a significant role in marine ecosystems. Corals can be either solitary or colonial, with colonial corals building large reef structures that are crucial to marine life.

Features of coral:

1. **Symbiotic Relationship:** Corals have a mutualistic relationship with zooxanthellae algae, providing them with nutrients, while algae provide energy through photosynthesis.

2. **Coral Polyps:** Corals consist of soft-bodied polyps that secrete a calcium carbonate exoskeleton, forming reef structures over time.

3. **Coloration:** Corals have vibrant colours due to zooxanthellae. Stress can cause coral bleaching, where corals expel the algae and turn white.

4. **Feeding:** Polyps are carnivorous, capturing plankton with tentacles and also gaining nourishment from photosynthesis by algae.

5. **Reproduction:** Corals reproduce both sexually and asexually. In asexual reproduction, polyps produce new polyps by budding, growing from the parent colony. In sexual reproduction, corals release eggs and sperm into the water, where fertilization occurs.

6. **Growth and Lifespan:** Corals grow slowly, some species living over 100 years, while reefs can be thousands of years old.

7. **Environmental Sensitivity:** Corals are sensitive to temperature, water quality, and acidity. Changes can lead to coral bleaching and other threats from climate change, pollution, and overfishing.

Orbicella franksi (boulder star coral), St. Croix, U.S. Virgin Islands
May 2023 - Healthy   October 2023 - Bleached   March 2024 - Recovered

CHRONOLOGY OF FOUR MAJOR MASS CORAL BLEACHING EVENTS:

1. **1998:** The first major global coral bleaching event, caused by a significant rise in sea temperatures, affected reefs worldwide, including the Great Barrier Reef. This event led to widespread coral mortality.

2. **2010:** Another global bleaching event occurred, with extreme temperatures once again stressing coral ecosystems, resulting in severe damage to reefs across the globe.

3. **2014-2017:** This extended bleaching event affected more than half of all coral reefs worldwide, including the Great Barrier Reef, where 50% of the reefs perished. In 2017, 75% of the Great Barrier Reef was impacted by bleaching.

4. **2024:** The fourth major global bleaching event began, further stressing coral reefs, exacerbated by rising ocean temperatures. If the warming trend continues, it threatens the survival of coral ecosystems worldwide.

MASS CORAL BLEACHING IN INDIA:

1. **Widespread Impact:** Coral bleaching has been reported in multiple critical marine areas in India, including Lakshadweep, the Gulf of Mannar, Palk Bay of Tamil Nadu, and the Andaman Islands, indicating a widespread environmental crisis.

2. **Severe Effects in Lakshadweep:** The Lakshadweep archipelago, consisting of 36 islands, has been iden-

tified as the most affected region in India. Prolonged marine heatwaves since October 2023 have led to significant coral bleaching, threatening the unique biodiversity of this area.
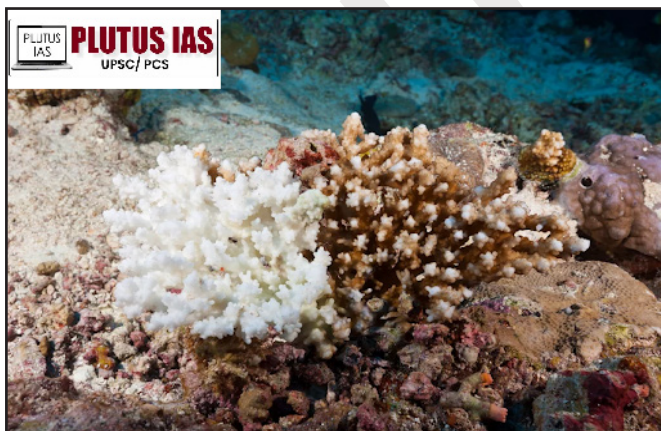
3. **Climate Change Connection:** Coral bleaching is primarily driven by rising sea surface temperatures, a direct consequence of climate change. This phenomenon highlights the urgent need to address global warming and its impacts on marine ecosystems.

4. **Ecological Consequences:** Coral reefs are vital for marine biodiversity, serving as habitats for numerous species. Mass bleaching can lead to the decline of fish populations and other marine organisms, disrupting the entire marine food web.

5. **Economic Implications:** Many coastal communities in India rely on healthy coral reefs for their livelihoods, particularly in fishing and tourism. The decline of coral health due to bleaching can have severe economic repercussions for these communities.

6. **Need for Conservation Efforts:** The situation calls for enhanced marine conservation strategies, including the establishment of marine protected areas, sustainable fishing practices, and initiatives to reduce pollution and other anthropogenic pressures.

7. **Call for Climate Action:** Addressing the root causes of climate change is essential to prevent further coral bleaching events. This includes global efforts to reduce greenhouse gas emissions and promote renewable energy sources.

CAUSES OF MASS CORAL BLEACHING:

1. **Increased Sea Temperatures:** The primary cause of mass coral bleaching is elevated sea temperatures, which result from climate change. Corals are highly sensitive to temperature changes, and prolonged exposure to elevated temperatures causes them to expel the symbiotic algae (zooxanthellae) that live within their tissues, leading to bleaching.

2. **Storms:** Strong storms and cyclones can cause physical damage to coral reefs, increasing their vulnerability to bleaching. The disturbance can also lead to changes in water quality and the amount of sediment suspended in the water, further stressing corals.

3. **Disease:** Coral diseases, often exacerbated by

warmer temperatures, can contribute to bleaching by weakening corals and making them more susceptible to environmental stressors.

4. **Sediments:** Increased sedimentation from coastal developments, agriculture, or storms can smother corals, block sunlight, and cause them to bleach. Sediment-laden water can also reduce water quality, further stressing coral ecosystems.

5. **Changes in Salinity:** Fluctuations in salinity, often caused by heavy rainfall, river discharge, or flooding, can stress corals and contribute to bleaching events. For example, freshwater influxes from storms can lower the salinity in coral reef ecosystems, further stressing the corals.

6. **El Niño and La Niña Events:** During El Niño conditions, warmer sea temperatures and reduced rainfall often lead to mass bleaching on reefs, particularly in the 6. Kimberley region of Western Australia. Conversely, La Niña conditions can cause bleaching events in reefs further south. However, recent years have seen this pattern break down, with mass bleaching occurring in both conditions.

7. **Flood Plumes:** In 2008 and 2011, coral bleaching in the Great Barrier Reef was exacerbated by an influx of freshwater due to flooding. The flood plumes, which carry excess nutrients and sediments, can alter local water conditions, contributing to coral stress and bleaching.

IMPACTS OF CORAL BLEACHING:

1. **Loss of Biodiversity:** Coral reefs are home to a wide variety of marine species, such as sea turtles, fish, and crabs. When coral reefs bleach and die, these species lose their habitats, leading to the potential extinction of vulnerable marine life.

2. **Disruption of the Food Chain:** Coral reefs support organisms at the base of the ocean food chain. When reefs collapse due to bleaching, it disrupts the entire food web, affecting the survival of many marine species.

3. **Decline in Coastal Protection:** Coral reefs act as natural barriers against waves and storm surges. Without healthy reefs, coastal communities become more vulnerable to extreme weather events and must rely on costly, less effective, and environmentally damaging man-made alternatives like seawalls.

4. **Threat to Fishing Industry:** Coral reefs provide spawning grounds for fish and crustaceans. Bleached reefs hinder these processes, reducing fish populations and threatening the livelihoods of those who depend on fishing for income and food security.

5. **Impact on Reef Tourism:** Coral reefs attract millions of tourists each year for activities like snorkelling and diving. Coral bleaching diminishes the aesthetic value and biodiversity of reefs, leading to a decline in tourism revenue and threatening jobs within the sector.

6. **Economic Consequences:** The collapse of coral reefs due to bleaching impacts both local and global economies. Communities dependent on reef-based industries like fishing and tourism face economic losses, which can lead to broader socio-economic challenges.

7. **Increased Vulnerability to Climate Change:** Coral bleaching exacerbates the impacts of climate change, making coastal communities and ecosystems more susceptible to sea-level rise, extreme weather events, and changes in ocean chemistry, further endangering global marine health.

INTERNATIONAL INITIATIVES TO PROTECT CORAL REEFS:

1. **Global Coral Reef Monitoring Network (GCRMN):** A global network of scientists and organizations dedicated to monitoring the status of coral reef ecosystems to track their health and provide early warning systems.

2. **The Coral Reef Breakthrough:** A partnership involving the International Coral Reef Initiative (ICRI), the Global Fund for Coral Reefs (GFCR), and the High-Level Climate Champions (HLCC), working to implement strategies to protect and restore coral reefs worldwide.

3. **Reef Restoration and Adaptation Program (RRAP):** A program focused on developing strategies and interventions to help coral reefs, such as the Great Barrier Reef, adapt to the challenges of climate change.

4. **The Reef-World Foundation:** An NGO dedicated to promoting better environmental practices in the marine tourism industry to reduce the human impact on coral reefs.

5. **UN Environment Programme:** Supports marine protected areas, promotes waste management in ports, and improves waste disposal facilities to reduce the negative impacts on coral ecosystems.

6. **Coral Reef Alliance:** Focuses on advancing coral conservation science and influencing marine ecosystem management to protect coral reefs globally.

WAY FORWARD TO REDUCE CORAL BLEACHING:

1. **Avoid Water Pollution:** Prevent harmful chemicals from entering water bodies, including household waste, plastics, and industrial chemicals, to preserve coral ecosystems.

2. **Minimize Use of Harmful Chemicals:** Reduce the use of fertilizers, insecticides, pesticides, and herbicides, as they can contribute to nutrient pollution, which harms coral reefs.

3. **Treat Industrial Waste:** Properly treat harmful industrial waste before disposing of it into oceans to prevent coral reef degradation.

4. **Conserve Water:** Efficient water usage helps reduce runoff and excess nutrient flows into oceans, which can lead to coral bleaching.

5. **Sustainable Seafood Consumption:** Choose sustainably sourced seafood to support marine ecosystems, including coral reefs.

6. **Volunteer for Cleanup Efforts:** Participate in or organize local efforts to remove trash from beaches and marine environments, reducing threats to coral reefs.

7. **Reduce Stormwater and Fertilizer Runoff:** Support initiatives that reduce runoff, which carries pollutants and excess nutrients into the ocean, causing coral degradation.

8. **Implement Biorock Technology:** Use Biorock technology, which involves creating artificial reef structures using electric currents to stimulate coral growth and recovery. This method has been proven to enhance coral resilience to bleaching and improve the survival rates of young corals.

CONCLUSION

The ongoing Fourth Global Coral Bleaching Event highlights the urgent need to address climate change, as rising sea temperatures threaten coral reefs in India and globally. Coral bleaching disrupts marine ecosystems, harms biodiversity, and impacts local economies. Immediate conservation efforts, including reducing pollution, protecting marine areas, and combating climate change, are essential to preserve coral reefs. International initiatives focused on monitoring, restoration, and sustainable practices offer hope, but global action is critical to prevent further degradation and ensure the survival of these vital ecosystems.

PRELIMS QUESTION:

Q. Consider the following statements regarding coral reefs:

1. Corals are marine invertebrates belonging to the phylum Cnidaria.

2. Coral reefs are primarily formed by solitary corals.

3. Coral bleaching occurs when corals expel symbiotic algae due to elevated sea temperatures.

4. Coral reefs do not play a significant role in marine ecosystems.

Which of the above statements is/are correct?

A. 1 and 3 only

B. 1, 2, and 3 only

C. 1 and 3 only

D. 1, 3, and 4 only

Answer: A

MAINS QUESTION:

Q. "Mass coral bleaching events, driven by rising sea temperatures and climate change, are severely impacting marine ecosystems worldwide. Discuss the causes, effects, and measures to mitigate coral bleaching.

(250 words, 15 marks)

CLOUD SEEDING: A VIABLE OPTION FOR IMPROVING AIR QUALITY

WHY IN THE NEWS?

Recently, Delhi has been grappling with record levels of air pollution, prompting the government to consider "cloud seeding" or "artificial rainfall" as an emergency measure to tackle the crisis. The Delhi government has urged the Centre to convene an urgent meeting and approve plans to induce artificial rain over the city to combat the severe pollution levels.

WHAT IS CLOUD SEEDING?

Cloud seeding is a weather modification technique that involves dispersing substances into the atmosphere to stimulate cloud condensation and encourage precipitation. It is commonly employed to enhance rainfall, reduce hail, and dissipate fog, especially in areas facing water scarcity or critical water resource challenges.

HOW CLOUD SEEDING WORKS

1. Process:
Particles are released into clouds, serving as nuclei around which water droplets form.
This increases the coalescence of water droplets, enhancing the likelihood of precipitation.

2. Common Substances Used

Silver Iodide: Mimics ice nuclei and is widely used for cold cloud seeding.
Sodium Iodide: Offers unique properties suitable for weather modification.

THE ROLE OF SILVER IODIDE IN CLOUD SEEDING:

1. **Chemical Properties:** Silver iodide (AgI) has a crystalline structure similar to ice, making it particularly effective in cold clouds where temperatures are below freezing.

2. **Effectiveness:** It enhances precipitation in cold and mixed-phase clouds by providing critical ice nuclei.

3. **Environmental Impact:** Concerns exist regarding its potential toxicity, particularly to aquatic ecosystems and the broader environment.

APPLICATIONS OF CLOUD SEEDING:

1. **Water Resource Management:** Cloud seeding helps replenish aquifers and reservoirs, providing additional water for agricultural and municipal needs.

2. **Drought Mitigation:** It aids in alleviating drought conditions by increasing precipitation levels.

3. **Snowpack Enhancement:** By boosting snowfall in mountainous regions, cloud seeding ensures a steady water supply from snowmelt.

4. **Air Quality Improvement:** Precipitation induced by cloud seeding helps wash pollutants out of the atmosphere, improving air quality.

5. **Airport Runway Stability:** Cloud seeding creates stable weather conditions around airports, ensuring safer aircraft takeoffs and landings.

LIMITATIONS OF CLOUD SEEDING:

1. **Limited Effectiveness:** Cloud seeding cannot fully resolve drought conditions and only partially addresses water shortages. It is effective only on specific types of clouds and cannot generate rainfall from all cloud formations.

2. **Unpredictable Weather Effects:** The process can sometimes lead to abnormal weather events, such as flash floods.

3. **Environmental and Health Risks:** The chemicals used in cloud seeding are toxic, posing risks to both the environment and human health.

4. **Impact on Global Warming:** Some chemicals released during cloud seeding contribute to global warming.

5. **Limited Scope of Influence:** Cloud seeding can only alter certain clouds and does not affect large-scale weather patterns or climatic events.

6. **Feasibility Issues:** The Central Pollution Control Board (CPCB) has declared cloud seeding infeasible in Delhi for managing winter pollution due to insufficient atmospheric moisture and the need for pre-existing clouds.

SUSTAINABLE BAYS :

Sustainable bays refer to the management and conservation of bay ecosystems in a way that balances ecological health, economic benefits, and social well-being. This involves maintaining the natural processes and biodiversity of bays while ensuring that human activities, such as fishing, tourism, and development, do not degrade the environment.

Key aspects of managing sustainable bays include:

1. **Marine Conservation:** Protecting marine life and habitats within bays by creating marine protected areas (MPAs) and enforcing laws to prevent overfishing, pollution, and habitat destruction.

2. **Water Quality Management:** Implementing measures to control pollution (from industrial, agricultural, and urban sources) and reduce nutrient loading (such as nitrogen and phosphorus) that leads to issues like algal blooms, hypoxia (low oxygen), and water contamination.

3. **Coastal Protection:** Protecting shorelines from erosion and degradation by using sustainable techniques, such as mangrove restoration, coral reef protection, and the creation of artificial reefs.

4. **Community Engagement:** Involving local communities in sustainable management practices, such as sustainable fishing, eco-tourism, and public education on the importance of bay ecosystems.

5. **Climate Change Adaptation:** Taking action to make bays more resilient to climate change impacts like sea-level rise and extreme weather events through adaptive management and infrastructure solutions.

6. **Sustainable Development:** Ensuring that human development within and around bays, such as urbanization and infrastructure projects, is done in a way that does not compromise the long-term health of the ecosystem.

CONCLUSION

Cloud seeding holds potential for improving air quality and water resources, but its use in Delhi to address severe pollution is limited and controversial. While it can aid in precipitation, it has drawbacks such as environmental risks, unpredictable weather, and limited effectiveness. Concerns about the toxicity of chemicals like silver iodide also raise environmental issues. The Central Pollution Control Board (CPCB) notes that cloud seeding may not be feasible in Delhi due to inadequate moisture and cloud conditions. A more sustainable, long-term solution to Delhi's pollution requires stricter regulations, advanced pollution control technologies, and increased public awareness.

PRELIMS QUESTION:

Q. Consider the following statements:

1. Cloud seeding involves the dispersion of substances like silver iodide to stimulate cloud formation and induce precipitation.

2. The Central Pollution Control Board (CPCB) has declared cloud seeding to be highly effective for managing air pollution in all regions.

3. Cloud seeding can also be used to improve snowpack in mountainous regions, which helps in water resource management.

How many of the statements given above are correct?

A. Only one

B. Only two

C. All three

D. None

Answer: A

MAINS QUESTION:

Q. Cloud seeding has been considered as a potential solution for improving air quality and addressing water resource challenges. However, its effectiveness and environmental impact remain contentious. Discuss the process, applications, and limitations of cloud seeding in managing pollution and water scarcity.

(250 words, 15 marks)

ELECTRIC VEHICLE (EV) TECHNOLOGY: GREENING THE TRANSPORTATION.

WHY IN THE NEWS?

India is experiencing a rapid rise in the adoption of electric vehicles (EVs) as part of its efforts to reduce air pollution, lower carbon emissions, and decrease dependence on fossil fuels. Recently, the Indian government has intensified its push for EVs through initiatives like the FAME India Scheme and the Production Linked Incentive (PLI) Scheme, offering financial incentives for manufacturers and consumers. Advancements in EV technology, such as regenerative braking, battery-swapping policies, and vehicle-to-grid integration, further support this drive.
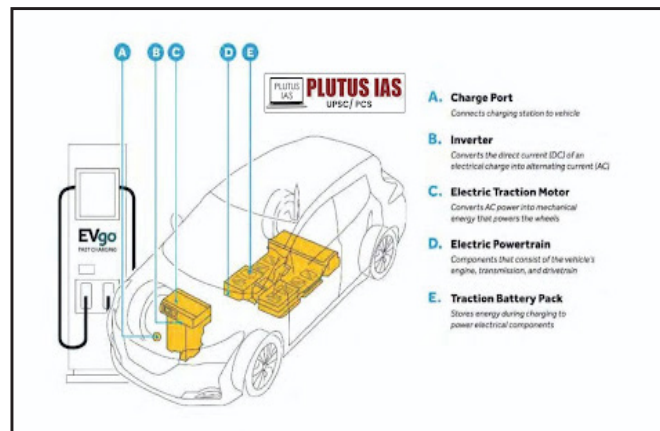

ELECTRIC VEHICLE (EV) TECHNOLOGY

Electric vehicle (EV) technology refers to the use of electricity to power vehicles, aiming to reduce the environmental impact of transportation and decrease reliance on fossil fuels.

TYPES OF ELECTRIC VEHICLES:

1. **Battery Electric Vehicles (BEVs):** Also called All-Electric Vehicles (AEVs), BEVs are powered solely by electric energy stored in lithium-ion batteries. They require plugging into a charging station to recharge the battery, and they produce no tailpipe emissions.

2. **Plug-in Hybrid Electric Vehicles (PHEVs):** These vehicles have both an electric motor and an internal combustion engine. They can be recharged via an external power source or by using the internal engine and generator to charge the battery, offering flexibility for long-distance travel.

3. **Hybrid Electric Vehicles (HEVs):** HEVs combine an internal combustion engine with an electric motor. The motor assists with driving the vehicle, but the battery is not typically plugged in for recharging. Instead, it charges via regenerative braking or the engine itself.

WORKING WITH ELECTRIC CARS:

GOVERNMENT POLICIES AND SCHEMES:

1. FAME India Scheme (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles): Launched in 2015, this scheme provides subsidies for the purchase of electric vehicles and encourages the manufacturing of EVs and hybrid vehicles. It aims to make EVs more affordable and increase their adoption across the country.

2. **Production Linked Incentive (PLI) Scheme:** This scheme offers financial incentives to manufacturers who meet specific production targets for electric vehicles and related components. It aims to boost domestic manufacturing and reduce dependence on imports.

3. **Battery Swapping Policy:** This policy addresses one of the main challenges in EV adoption- charging times. It promotes battery swapping stations where drained batteries can be quickly replaced with fully charged ones, improving the convenience and efficiency of EVs.

4. **Model Building Bye-laws (MBBL), 2016:** The MBBL mandates that residential and commercial buildings allocate 20% of their parking space for EV charging facilities. This ensures the availability of charging infrastructure as the number of EVs increases.

5. **Charging Infrastructure Incentives:** The government provides incentives such as land allocation and tax benefits to encourage public-private partnerships (PPPs) in developing the necessary charging infrastructure across the country. This will help create a widespread, accessible network for EV users.

6. **New Electric Vehicle Policy 2024:** The 2024 policy focuses on stimulating innovation in EV technology, supporting domestic manufacturing, reducing crude oil imports, mitigating air pollution, and contributing to India's climate goals. This comprehensive policy is designed to accelerate the adoption of EVs while achieving broader environmental and economic objectives.

BENEFITS OF ELECTRIC VEHICLES (EVS):

1. **Lower Running Costs:** EVs are much cheaper to operate compared to traditional petrol or diesel vehicles. They use electricity, which is more cost-effective, especially when combined with renewable energy sources like solar panels. This significantly reduces the cost of daily commutes and long-distance travel.

2. **Low Maintenance Costs:** With fewer moving parts than conventional vehicles, EVs require less maintenance, resulting in lower servicing costs. The absence of components like an internal combustion engine or exhaust system reduces wear and tear, making EVs a cost-effective option in the long run.

3. **Zero Tailpipe Emissions:** One of the most significant advantages of EVs is their zero tailpipe emissions. This helps reduce carbon footprints, combat climate change, and improve air quality, especially in urban areas.

4. **Tax and Financial Benefits:** EVs often benefit from lower registration fees, road taxes, and government incentives. Policies vary by state, but many offer financial benefits that make owning an EV more affordable.

5. **Environmental Impact:** Petrol and diesel vehicles contribute heavily to pollution, affecting public health and the environment. EVs offer a cleaner alternative with much lower emissions, both in terms of tailpipe emissions and energy consumption. They are more efficient and use up to 60% of the grid's electrical energy for propulsion.

6. **Convenience of Charging at Home:** EV owners can conveniently charge their vehicles at home, eliminating the need to visit fuel stations. Charging at home before heading out saves time and reduces the stress of refueling, especially during peak hours.

7. **Quiet Operation and No Noise Pollution:** EVs are incredibly quiet, as they don't have traditional engines. This not only provides a peaceful driving experience but also helps reduce noise pollution in cities. Some EVs have added artificial sounds to ensure safety for pedestrians, but they remain much quieter than conventional vehicles.

8. **Easy to Drive:** EVs offer a simpler driving experience as they don't have gears. Drivers only need to accelerate, brake, and steer, making them user-friendly for all age groups and driving experience levels.

9. **Reduced Dependence on Fossil Fuels:** The use of petrol and diesel is harmful to the environment and contributes to the depletion of fossil fuels. EVs are a sustainable solution, reducing dependency on non-renewable energy sources and aiding in the transition to a greener future.

CHALLENGES OF THE EV INDUSTRY:

High Battery Costs: EV batteries are one of the most expensive components, making electric vehicles significantly pricier than traditional cars. While manufacturers are investing in affordable battery technologies, the high cost remains a barrier for many buyers.

Limited Charging Infrastructure: The lack of sufficient charging stations, particularly in rural and suburban areas, discourages EV adoption. Many charging attempts fail due to issues such as damaged chargers, congestion, or difficulty locating stations.

Range Anxiety: Consumers often worry about the limited driving range of EVs and their ability to handle long-distance travel. Although modern EVs achieve ranges of over 300 miles per charge, this concern persists among potential buyers.

Supply Chain Challenges: The production of EVs depends on critical materials like lithium, cobalt, and nickel, which face supply chain disruptions and rising costs. Geopolitical tensions and mining challenges further complicate the availability of these essential resources.

Gender Interest Gap: Surveys show men are more likely than women to prefer EVs, a disparity influenced by marketing, practicality, and affordability concerns. Targeted strategies addressing the needs and preferences of women drivers could help bridge this gap.

Recycling and Disposal: Recycling EV batteries remains a challenge, with inefficiencies threatening the sustainability of electric vehicles. Manufacturers are developing recycling programs to repurpose and efficiently recycle used batteries.

High Initial Costs: Despite offering long-term savings, EVs have higher upfront costs than conventional vehicles, deterring budget-conscious buyers. Lowering production costs and passing savings to customers is crucial to increase accessibility.

Grid Capacity Strain: Many power grids are not equipped to handle the growing demand for EV charging, leading to strain and congestion. Expanding grid capacity and integrating renewable energy sources are essential to support future EV growth.

Resistance from Traditional Automakers: Some established car manufacturers are slow to transition fully to EV production, focusing instead on hybrids or fossil-fuel vehicles. This resistance slows innovation and affects consumer confidence in the EV market.

WAY FORWARD TO OVERCOME EV ADOPTION CHALLENGES IN INDIA

1. **Government Incentives:** The Indian government can continue to offer subsidies and incentives under the FAME India Scheme and additional tax rebates to reduce the upfront costs for consumers.

2. **R&D Investment:** Increasing investments in battery research and development (R&D) to develop cost-effective, high-performance battery technologies will be crucial. Manufacturers like Tata and Mahindra are already focusing on producing lithium-ion batteries locally to reduce dependency on imports and cut costs.

3. **Battery Leasing Models:** Companies like Ola Electric are exploring battery leasing models, where consumers can pay only for battery usage, reducing the initial vehicle cost. Expanding these models will make EVs more affordable.

4. **Public-Private Partnerships (PPPs):** The government should expand public-private partnerships to develop a robust network of charging stations across the country. State and municipal bodies can also incentivize the installation of charging points in commercial spaces, residential buildings, and along highways.

5. **Fast Charging Technology:** Expanding the availability of fast chargers and supporting companies working on ultra-fast charging technologies will significantly reduce charging time and make EVs more convenient for long-distance travel.

6. **Home Charging Solutions:** Encouraging individuals to install home chargers and offering incentives for installing at-home charging stations, particularly in urban areas, can reduce the reliance on public charging infrastructure.

7. **Incentivizing Transition:** The government can provide incentives for automakers to ramp up EV production and phase out fossil-fuel vehicles. Policies that mandate a certain percentage of electric vehicles in the production line can force the industry to innovate and meet the demand for EVs.

8. **Industry Collaboration:** Collaboration between traditional automakers, EV manufacturers, and tech companies can foster innovation and speed up the transition to electric vehicles.

9. **Grid Upgrades and Smart Grids:** The government should invest in modernizing and expanding the electricity grid to handle the increased load. Implementing smart grids that can manage the charging patterns of EVs more efficiently will be essential.

10. **Renewable Energy Integration:** Integrating renewable energy sources, like solar and wind, into the grid will ensure that the energy used to charge EVs is sustainable. The government's push for renewable energy capacity will play a crucial role in supporting the transition to EVs.

CONCLUSION:

In essence, electric cars are powered by the stored energy in their traction battery pack, which is converted by an inverter and used by the electric motor to move the vehicle. The charging process, energy storage, and power transfer mechanisms work seamlessly to deliver a smooth and efficient driving experience while reducing harmful emissions.

PRELIMS QUESTION:

Q. With reference to Electric Vehicle Technology, Consider the following statement:

1. The EV technology AC-DC current converter to run vehicle motor.

2. The tailpipe emission from the EV vehicles is zero.

3. The FAME India initiative is to promote EV use in India.

How many of the above-given statements are correct?

A. Only one

B. Only two

C. All three

D. None

ANSWER: C

MAIN QUESTION:

Q. "Despite the promising potential of electric vehicle (EV) technology for greener transportation, several challenges remain. Discuss the current loopholes in EV technology and suggest measures to address them for sustainable and widespread adoption of electric vehicles."

(Answer 250 words)

STRENGTHENING NATIONAL SECURITY: KEY TAKEAWAYS FROM THE 59TH ALL INDIA CONFERENCE OF DIRECTORS GENERALS/INSPECTOR GENERALS OF POLICE"

WHY IN THE NEWS?

The 59th All India Conference of Directors Generals/ Inspector Generals of Police will be held at the State Convention Centre, Bhubaneswar, Odisha. The three-day conference will focus on key national security issues, including counterterrorism, left-wing extremism, coastal security, new criminal laws, and narcotics. The President's Police Medal for distinguished service will also be awarded. The conference will provide a platform for senior police professionals to discuss challenges related to crime control, law and order, and internal security.

STATE POLICE SERVICE IN INDIA:

1. **Structure:** Each Indian state has its own police force led by a Director General of Police (DGP). The state police handle law enforcement, crime prevention, and maintaining public order within their respective jurisdictions.

2. **Personnel:** India's state police forces collectively employ over 2.5 million personnel, making it one of the largest police organizations in the world.

3. **State vs Central Police:** State police handle most law and order duties, while Central Armed Police Forces (CAPF), like the CRPF, BSF, and CISF, assist in border security and specialized operations.

4. **Jurisdiction:** State police have jurisdiction within their state, handling crimes such as murder, robbery, and other offences. The Central Bureau of

Investigation (CBI), however, can take over cases of national importance.

5. **Crime Data:** In 2023, the National Crime Records Bureau (NCRB) reported over 50 lakh criminal cases across the country, with state police forces managing the bulk of investigations and prosecutions.

6. **Reforms and Modernization:** Many states are working on police modernization, improving infrastructure, training, and technology integration, such as the Crime and Criminal Tracking Network & Systems (CCTNS), for better data handling and coordination.

7. **Women in Policing:** Representation of women in state police forces is increasing, with states like Kerala, Tamil Nadu, and Delhi seeing significant numbers of female officers in specialized roles. However, overall female representation remains under 10%.

8. **Community Policing:** Several states are promoting community policing initiatives, with programs like Janamaithri Police (Kerala) to foster better police-public relationships.

ROLE OF POLICE MAINTAINING INTERNAL SECURITY:

1. **Law and Order:** Maintain peace, prevent civil disturbances, and protect citizens' rights.

2. **Crime Prevention and Investigation:** Detect and investigate crimes, ensuring public safety and justice.

3. **Counterterrorism:** Combat terrorism by gathering intelligence, disrupting cells, and preventing attacks.

4. **Left-Wing Extremism:** Address insurgencies like Naxalism through counterinsurgency operations.

5. **Border and Coastal Security:** Collaborate with central agencies to protect borders and coastlines from illegal activities.

6. **Disaster Response:** Assist in emergency situations and maintain order during natural calamities or crises.

7. **Anti-Organized Crime:** Dismantle criminal networks involved in smuggling, trafficking, and illegal activities.

8. **Cybersecurity:** Combat digital crimes like hacking, fraud, and online threats.

ISSUES WITH THE POLICE FORCE IN INDIA:

1. **Shortage of Manpower:** Insufficient police personnel leads to overburdened officers and inadequate law enforcement.

2. **Lack of Infrastructure:** Outdated equipment and facilities hinder effective policing and crime management.

3. **Dependence on Central Agencies:** Over-reliance on agencies like CBI and CRPF reduces the autonomy and operational capacity of state police.

4. **Political Interference:** External political pressures impact police impartiality and decision-making, undermining public trust.

5. **Gender Inequality:** Underrepresentation of women and challenges in career progression contribute to gender imbalance in the workforce.

6. **Emerging Threats:** Lack of resources and expertise to combat cybercrime and other modern security threats.

RECOMMENDATION/ MAJOR MAKE POLICE SERVICE A TRUE WALL OF PROTECTION:

1. **Community Policing and Engagement:** Build strong relationships with the community and involve citizens in decision-making processes.

2. **Enhanced Training Programs:** Train officers in de-escalation, cultural sensitivity, bias, and mental health crisis intervention.

3. **Accountability and Transparency:** Require body cameras, establish civilian oversight, and regularly release police data.

4. **Focus on Officer Well-being:** Provide mental health support and stress management, and ensure work-life balance for officers.

5. **Use of Technology for Efficient Policing:** Implement data-driven policing and equip officers with non-lethal tools.

6. **Clear and Transparent Policies on Use of Force:** Establish strict use-of-force guidelines and require immediate reporting and justification of force.

7. **Public Education and Outreach:** Educate the public on their rights and organize community events to build positive relationships with police.

8. **Building a Diverse Workforce:** Encourage local recruitment and promote diversity in police leadership.

CONCLUSION

The 59th All India Conference of Police Chiefs is focusing on key national security concerns like counterterrorism and coastal security. State police services play a critical role in maintaining internal security but face challenges such as manpower shortages, outdated infrastructure, political interference, and emerging threats like cybercrime. To strengthen the force, it is essential to enhance community policing, improve training, increase accountability, prioritize officer well-being, and integrate modern technology. Promoting gender equality and diversity in leadership will also foster better public trust.

PRELIMS QUESTION:

Q. Which of the following statements is correct regarding the role of police in maintaining internal security in India?

1. The police force is responsible for maintaining law and order, preventing civil disturbances, and ensuring public safety.

2. The police are mainly tasked with border security and counterinsurgency operations in collaboration with the Indian Armed Forces.

3. Women in policing represent more than 30% of the total police force in India.

Select the correct answer using the code given below:

A. 1 and 2 only

B. 1 and 3 only

C. 2 and 3 only

D. 1 only

Answer: A

MAINS QUESTION:

Q. Discuss the major challenges faced by the state police services in India in ensuring internal security and suggest measures to enhance their effectiveness.

(250 words, 15 marks)