DAILY CURRENT AFFAIRS 12-11-2024

GS-1

1. **Yamuna River**

GS-2

2. **Does data justify subdivision of quotas?**
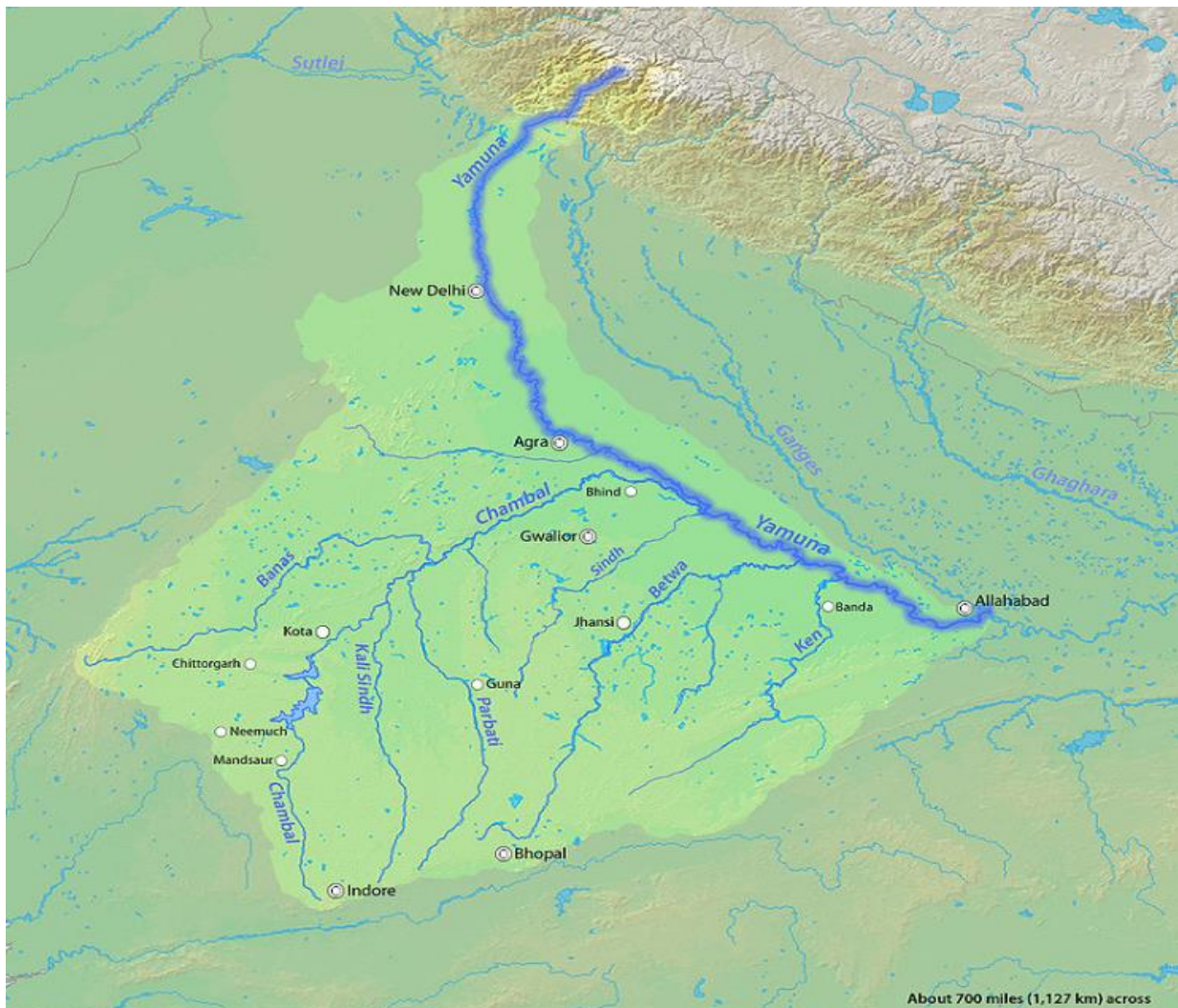
GS-3

3. **Tuna Cluster**

4. **Transponder Technology**

5. **Titanium**

Yamuna River

Syllabus: GS-1; Geography- Rivers of India

Context

➢ Devotees ignore toxic warnings at Yamuna during Chhath Puja festival, bathing in contaminated water despite health risks.

Origin and Course

➢ The Yamuna River originates from the Yamunotri Glacier in the Lower Himalayas (Garhwal Himalayas) at an elevation of around 6,387 meters in Uttarakhand.
➢ It flows southward through several states, including Himachal Pradesh, Haryana, Delhi, Uttar Pradesh, and finally joins the Ganga at Allahabad (Prayagraj) in Uttar Pradesh.

➢ The river's total length is approximately 1,376 kilometers.

Tributaries

➢ Major tributaries of the Yamuna include the Chambal, Sindh, Betwa, and Ken rivers.
➢ Other important tributaries: Hindon, Somb, Tons, Giri.

Significance

➢ **Religious**: The Yamuna is one of the sacred rivers in Hinduism, with significant religious importance. It is mentioned in several scriptures, including the Rigveda and Mahabharata.
➢ **Cultural**: Historic cities such as Delhi, Agra, and Mathura lie on its banks. The Taj Mahal, a UNESCO World Heritage site, is located on the river's bank in Agra.
➢ **Economic**: The river basin supports extensive agriculture, providing irrigation to states like Haryana and Uttar Pradesh.

Environmental Concerns

➢ **Pollution**: The Yamuna is highly polluted, especially in the stretch passing through Delhi due to untreated sewage, industrial effluents, and other waste.
➢ **Encroachment**: Urban expansion along its banks has reduced its flow, leading to ecological issues.
➢ **Conservation Efforts**: Programs such as the Yamuna Action Plan (YAP), funded by the Government of India and supported by Japan, aim to reduce pollution levels and restore the river's ecology.

Hydroelectric Projects and Dams

➢ The Hathnikund Barrage and Tajewala Barrage in Haryana are crucial for diverting water for irrigation and drinking purposes.
➢ The Yamuna's water is heavily used for irrigation and drinking in the National Capital Region (NCR).

Challenges and Way Forward

➢ **Challenges**: Ensuring clean and consistent water flow, tackling pollution, managing population pressures, and coordinating interstate water sharing.
➢ **Way Forward**: Strengthening regulatory frameworks, increasing public awareness, and enhancing infrastructure for sewage treatment and waste management are essential steps toward reviving the Yamuna's health.

Does data justify subdivision of quotas?

Syllabus: GS-2; Reservations

Context

➢ Recent debates have questioned whether a 'quota-within-quota' system is needed to ensure that affirmative action policies are more equitable across Scheduled Caste subgroups.

Into the article

➢ India's reservation system has been a crucial tool for addressing the deep-rooted inequalities faced by marginalized communities, particularly Scheduled Castes (SCs) and Scheduled Tribes (STs).

➢ Introduced to provide opportunities in **education, government employment, and public offices, it aimed to move from legal equality to substantive equality.**

➢ However, questions about its effectiveness have emerged, especially concerning whether the benefits of reservations are equally distributed among all subgroups within the SC category.

Subdivision of the SC Quota

➢ The debate about the need for a 'quota-within-quota' system has gained traction, especially after a Supreme Court ruling questioned the fairness of the current reservation system.

➢ This system suggests subdividing the SC quota to target assistance at the most disadvantaged communities within SCs, ensuring more equitable outcomes.

➢ While some states like Punjab have implemented this policy, the results have been mixed.

Evidence from States:

➢ **Andhra Pradesh and Tamil Nadu**: In both states, data suggests little need for subdividing the SC quota, as socio-economic improvements have been fairly evenly distributed between the major SC subgroups (Malas and Madigas in Andhra Pradesh; Adi Dravida and Pallan in Tamil Nadu).

➢ **Punjab**: The subdivision of the SC quota has been successful in addressing inequalities, particularly for marginalized groups like Mazhabi Sikhs and Balmikis, who have gained ground over the more advanced SC groups like Ad Dharmis and Ravidasis.

➢ **Bihar**: The Mahadalit category introduced in 2007 failed due to political pressures, which diluted its effectiveness by including all SC groups rather than targeting the most disadvantaged ones.

Despite these state-specific experiences, the broader question remains: do all SCs benefit equally from reservations, or do certain groups benefit disproportionately?

Access to Reservation Benefits

➢ Access to reservation benefits is a critical issue. Data from the **India Human Development Survey (IHDS)** reveals that less than half of SC households in states like Uttar Pradesh and Bihar have caste certificates, a prerequisite for accessing reserved positions.
➢ While states like Tamil Nadu and Andhra Pradesh fare better, this disparity indicates that improving access to reservations should be a priority before considering subdivision.

Is 'Quota-within-Quota' the Solution?

➢ While some states have seen positive results from quota subdivision, the solution is not universally applicable.
➢ In states like Andhra Pradesh and Tamil Nadu, the system appears to be working effectively without further subdivision.
➢ However, political motivations, as seen in Bihar, can undermine the policy's intent.
➢ The inclusion of all SC groups in a 'Mahadalit' category, driven by political factors, diluted the program's effectiveness, illustrating how political expediency can distort the intended outcomes.
➢ The idea of a **"creamy layer" exclusion**, akin to what exists for Other Backward Classes (OBCs), has been suggested for SCs but needs a stronger evidentiary basis.
➢ This would involve excluding more economically advanced SCs from reservations, but without updated data, implementing this exclusion could be premature.

Ambedkar's Vision and the Need for Updated Data

➢ Dr. B.R. Ambedkar's vision of using reservations to ensure substantive equality remains relevant, but for it to be effective, we need accurate and updated data on caste-based disparities.
➢ The national Census, which could provide such data, has been delayed, and the lack of current, reliable information complicates efforts to reform the system.

Conclusion

➢ India's reservation system has undoubtedly helped many SCs escape poverty and achieve social mobility.

➢ However, its flaws—especially in terms of unequal access and distribution of benefits—cannot be ignored.

➢ The focus should shift towards ensuring that all eligible SCs can access reservations, rather than introducing complex and politically influenced sub-categories.

➢ If based on robust data and genuine need, the reservation system can continue to play a vital role in promoting social justice in India.

Tuna Cluster

Syllabus: GS-3; Infrastructure

Context

➢ To strengthen the fisheries sector, the Andaman and Nicobar government has approved the creation of a tuna cluster in the Andaman and Nicobar Islands. The initiative is a key component of the Pradhan Mantri Matsya Sampada Yojana (PMMSY), which aims to enhance the country's fisheries potentials.

More to know

Objective

➢ The tuna cluster is designed to support the sustainable development and enhancement of tuna fisheries in the Andaman and Nicobar Islands. This initiative

aims to leverage the region's rich marine resources to boost the local economy, provide employment, and contribute to national fisheries production.

Tuna Potential in Andaman and Nicobar

➢ The Andaman and Nicobar Islands have access to deep-sea resources, making them an ideal location for harvesting tuna, a high-value fish species. The favorable oceanic conditions around the islands support the growth of a robust tuna industry.

Components of the Tuna Cluster

➢ **Cold Storage and Processing Facilities**: The cluster includes infrastructure for cold storage and processing to ensure that the harvested tuna maintains its quality and market value.
➢ **Fishing Vessels and Equipment**: Investment in modern fishing vessels and gear is part of the cluster's focus, helping local fishers access deeper and more resource-abundant waters.
➢ **Training and Skill Development**: The initiative includes training programs for fishers on sustainable fishing practices, ensuring the industry's long-term viability and environmental sustainability.
➢ **Market Access and Export**: Enhanced facilities for processing and storage improve the marketability of tuna, making it possible to export high-quality tuna to international markets.

Alignment with Pradhan Mantri Matsya Sampada Yojana (PMMSY)

➢ **Funding and Support**: PMMSY is a flagship scheme under which the tuna cluster initiative is funded. PMMSY's broader goal is to increase fish production, double fishers' incomes, and promote sustainability.
➢ **Employment Generation**: The tuna cluster is expected to create employment opportunities in fishing, processing, marketing, and ancillary industries. PMMSY aims to create about 55 lakh employment opportunities in the fisheries sector, of which this tuna cluster will be a part.
➢ **Doubling Fishers' Income**: By improving market linkages and export potential, the cluster will contribute to PMMSY's goal of doubling the income of fishers and aquaculture farmers.

Significance for the Local Economy

➢ The initiative will help address issues of unemployment in the Andaman and Nicobar Islands by providing an economic boost to coastal communities involved in fishing.

➢ By tapping into global demand for high-quality tuna, it will also bring in foreign exchange earnings, boosting the regional economy.

Environmental and Ecological Sustainability

➢ Sustainable fishing practices will be promoted to ensure the long-term health of tuna stocks.

➢ The project includes efforts to minimize the environmental impact of fishing activities, aligning with PMMSY's goal of ecologically responsible fisheries.

Transponder Technology

Syllabus: GS-3; Science & Tech

Context

➢ The Department of Fisheries under the **Ministry of Fisheries, Animal Husbandry, and Dairying (MoFAH&D)** with the help of the Vessel Communication and Support System under the **Pradhan Mantri Matsya Sampada Yojana** has been able to enhance the safety and security of fishermen at sea.

➢ Launched by Prime Minister Mr. Narendra Modi, from Palghar, Maharashtra on 30th August, 2024 this project has an outlay of ₹364 crores.

➢ These transponders are being given to the fishermen free of cost.

About

➢ A **transponder** is an electronic device used to receive, amplify, and retransmit signals, often used in communication systems such as satellites.

➢ It works by receiving a signal at a specific frequency, amplifying it, and retransmitting it at a different frequency to avoid interference.

Types of Transponders

- **Communication Transponder**: Used in satellite communications to relay data, voice, or video signals.
- **Navigation Transponder**: Used in aviation (e.g., radar) and maritime services to provide position information.
- **Remote Sensing Transponder**: Used in space exploration, allowing for remote sensing and data transmission to Earth.

Working Principle

- Transponders operate through a principle of **duplex communication**: a signal is sent from Earth to the satellite, where the transponder receives and amplifies the signal, then retransmits it back to Earth at a different frequency.
- Transponders are powered by **solar panels** and use onboard **power amplifiers** to strengthen the signal.

Applications of Transponder Technology

- **Satellite Communication**: Transponders are integral to satellite services for broadcasting TV, internet, and telephone communication.
- **GPS Navigation**: In aviation, maritime, and land-based systems, transponders help track the position of objects.
- **Radar and Identification Systems**: Transponders in aviation and maritime navigation allow for identification and range measurements, enhancing safety.
- **Space Exploration**: Used in space probes and rovers for communication between Earth and the spacecraft.

Advantages

- **Signal Amplification**: Transponders help overcome the loss of signal strength over long distances, crucial for deep space communication.
- **Efficiency in Frequency Utilization**: The ability to shift frequencies prevents interference between communication channels.
- **Versatility**: Can be used across a wide range of applications in communication, navigation, and safety.

Challenges

- **Signal Interference**: Despite frequency shifting, transponders can still face issues from interference or jamming, which can affect communication.

➢ **Limited Power**: Satellite transponders have limited onboard power, impacting their range and functionality.

Transponder Technology in India

➢ **INSAT (Indian National Satellite System)**: India uses transponder technology in its INSAT and GSAT satellites for communication and broadcasting services.
➢ **GSAT Transponders**: The Indian Space Research Organisation (ISRO) uses transponders on its GSAT series of satellites for television, telephone, and data transmission services across India.
➢ **IRNSS (Indian Regional Navigation Satellite System)**: The system also uses transponders for providing navigation services.

Titanium

Syllabus: GS-3; Science and tech

Context

➢ In a recent study, An atomic beam of titanium produced from commercially available parts.

About

➢ **Symbol and Atomic Number**: Titanium (Ti), atomic number 22.
➢ **Physical Properties**: Lustrous, silver-gray metal; low density; high strength. Known for its excellent corrosion resistance, particularly to seawater and chlorine.

Occurrence

➢ **Abundance**: Ninth most abundant element on Earth, primarily found in minerals like ilmenite ($FeTiO_3$) and rutile (TiO_2).
➢ **Major Deposits**: Australia, South Africa, and Canada hold significant titanium reserves.

Production

➢ **Kroll Process**: The most common extraction method, where titanium tetrachloride ($TiCl_4$) is reduced by magnesium.

- **Cost and Challenges**: Extraction is expensive and energy-intensive, limiting titanium's widespread industrial use.

Uses

- **Aerospace Industry**: Due to its strength-to-weight ratio, titanium alloys are used extensively in aircraft, spacecraft, and military applications.
- **Medical Applications**: Non-toxic and biocompatible, making it ideal for surgical implants and prosthetics.
- **Industrial Uses**: Employed in desalination plants, heat exchangers, and chemical industries due to its corrosion resistance.
- **Consumer Goods**: Used in premium sports equipment, jewelry, and electronics.

Environmental Impact

- Titanium production is energy-intensive, raising concerns over carbon emissions.
- Recycling titanium is economically viable, reducing environmental impact and supporting a circular economy.

Titanium in India

- India holds large reserves, especially in the states of Tamil Nadu and Odisha.
- The Department of Atomic Energy manages and regulates titanium mineral resources for strategic use, particularly in defense and space sectors.