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7 PM COMPILATION

1st to 15th June, 2023

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- ❖ Comprehensive coverage of a given current topic
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Vande Bharat trains: Potential and Challenges – Explained, pointwise
Topic: Economic development: Infrastructure
Sub Topic: Energy, Ports, Roads, Airports, Railways etc.

[Kurukshetra May 2023 Summary] Fostering Rural Crafts through One District One Product – Explained, pointwise
Topic: Economic development
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Recent development in India – Nepal relations – Explained, pointwise
Topic: International Relations
Sub Topic: India and Neighbourhood relations.

The Issue of Indian railway safety – Explained, pointwise
Topic: Economic development
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[Yojana May 2023 Summary] Digital health: leveraging technology for transforming health care – Explained, pointwise
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Law Commission's recommendations on sedition and its relevance – Explained, pointwise
Topic: Indian Constitution and Polity
Sub Topic: Criminal Justice System.

An analysis of PLI (production-linked incentive) scheme – Explained, pointwise
Topic: Economic development
Sub Topic: Changes in industrial policy and their effects on industrial growth.

Regulating AI (Artificial Intelligence): Need and way forward – Explained, pointwise
Topic: Science and Technology
Sub Topic: developments and their applications and effects in everyday life.

[Kurukshetra June 2023 Summary] Fostering Water Management for Food Security – Explained, pointwise
Topic: Human and Economic Geography
Sub Topic: Distribution of key natural resources across the world (including South Asia and the Indian sub-continent).

El Nino: Concept and impacts – Explained, pointwise
Topic: Geophysical Phenomena
Sub Topic: Important Geophysical phenomena

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Data Security in India: Need and Challenges – Explained, pointwise
Topic: Security Issues
Sub Topic: basics of cyber security.

Transgenic Crops in India: Need and Challenges – Explained, pointwise
Topic: Science and Technology
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Vande Bharat trains: Potential and Challenges – Explained, pointwise

Introduction

The Vande Bharat trains have emerged as a potential game-changer in the Indian railway system, offering high-speed and comfortable travel experiences. With their modern design, indigenous manufacturing, and emphasis on the Make in India initiative, these trains showcase India's technological advancements. They have achieved notable milestones, such as being the fastest train in the country and reducing travel time between cities. However, the expansion of Vande Bharat trains faces challenges, including joint venture issues, sanctions impacting spare parts availability, and production delays. Addressing these challenges is crucial to unlock the full potential of Vande Bharat trains in transforming India's rail network.

What are the Vande Bharat trains?

TRAIN 18

India's first indigenously built engine-less train likely to begin operations from December 15

It is being regarded as a **successor** to the Shatabdi Express

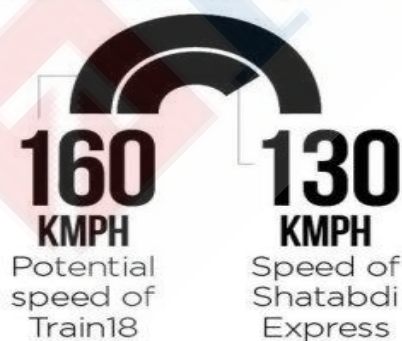**Developed by**
Integral Coach Factory, Chennai

Time taken
18 MONTHS

Estimated cost of the prototype
₹ **100 CR**

Train 18 vs **Shatabdi Express**

160 KMPH
Potential speed of Train18

130 KMPH
Speed of Shatabdi Express

Source: News Reports

Features

- Self-propelled train; doesn't require an engine
- 360 degree rotating seats
- AC chair-car type coaches
- Diffused lighting, automatic doors and footsteps
- GPS-based Passenger Information System
- CCTV cameras, Wi-Fi facility

When compared with Shatabdi

Train 18 will reduce travel time by

15%

NEWS18 creative

Source: News18

Read here: Explained: Fast-tracking Vande Bharat

What is the need for Vande Bharat trains?

Insufficient capacity: The Indian railways face the challenge of inadequate infrastructure to meet the growing demands of passenger and freight transportation. This results in congestion, delays, and suboptimal utilization of resources.

Aging infrastructure: Many rail tracks, bridges, and stations are in need of repair and modernization due to age and lack of maintenance. This affects the safety, speed, and efficiency of train operations.

Accidents and derailments: Safety remains a significant issue for Indian railways, with occasional accidents and derailments. Factors such as outdated signaling systems, inadequate maintenance, and human errors contribute to these incidents.

Outdated technology: The use of outdated signalling systems, manual ticketing processes, and limited adoption of modern technologies hinder the efficiency and effectiveness of railway operations.

Limited automation: The Indian railways are yet to fully embrace automation in various processes, such as ticketing, maintenance, and scheduling, which could improve operational efficiency.

Cleanliness and hygiene: Maintaining cleanliness and hygiene in trains and stations remains a concern, impacting the overall customer experience.

Read more: 102 Vande Bharat trains to be operational by 2024

What are some achievements of Vande Bharat trains?

Semi-high speed travel: Vande Bharat trains are India's first semi-high speed trains, designed to operate at speeds up to 160 kmph. The aerodynamic design helps the train reach 0-100 kmph in just 52 seconds, whereas other trains in the world takes upto 60 seconds. This allows for faster travel times and improved connectivity between cities.

Indigenous manufacturing: The Vande Bharat trains are manufactured in India, showcasing the country's capabilities in indigenous manufacturing. The trains are produced at Indian factories like the Integral Coach Factory in Chennai, promoting the "Make in India" initiative and supporting the growth of the domestic manufacturing sector.

Technological advancements: Vande Bharat trains incorporate advanced technologies and modern features to enhance passenger comfort and safety. These include features like automatic doors, regenerative braking, and state-of-the-art passenger amenities.

National and international recognition: These trains have showcased India's capabilities in manufacturing and implementing cutting-edge railway technology, reinforcing the country's position as a global player in the industry.

What are the potential benefits of Vande Bharat trains?

Boost to tourism and local economy: The introduction of Vande Bharat trains has the potential to stimulate tourism and boost local economies along their routes. For example, increased connectivity through Vande Bharat trains has led to improved accessibility to tourist destinations like Shirdi, promoting tourism and benefiting local businesses.

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Environmental sustainability: Vande Bharat trains contribute to environmental sustainability by incorporating energy-efficient technologies and reducing carbon emissions. These trains help in achieving a greener and more sustainable transportation system.

Employment generation: The manufacturing, operation, and maintenance of Vande Bharat trains generate employment opportunities. This includes skilled labor in manufacturing units, onboard train staff, and station personnel, contributing to job creation and economic growth.

Cultural exploration: Vande Bharat trains facilitate travel and exploration, allowing passengers to experience the diverse cultural heritage of India. By connecting various cities and regions, these trains enable tourists to explore different traditions and contribute to cultural exchange.

Energy efficiency: Vande Bharat trains are designed to be energy efficient, contributing to environmental conservation and sustainability. **The trains utilize regenerative braking**, which helps in the efficient use of energy and reduces carbon emissions.

Improved passenger experience: The trains offer a comfortable and modern travel experience for passengers, with features such as **ergonomic seating, Wi-Fi connectivity, GPS-based passenger information systems, and modular toilets**.

> **Must read: [Locally made green trains to be rolled out](#)**

What are the challenges in Vande Bharat train expansions?

Sanctions and international relations: The ongoing sanctions imposed on Russia following the Russia-Ukraine war have posed challenges for the Vande Bharat trains. These sanctions have affected the supply of spare parts from Western European and American manufacturers, hindering the smooth operation and maintenance of the trains.

Majority shareholding dispute: There is a disagreement between the Russian transportation giant Transmashholding (TNH) and the Indian public sector undertaking Rail Vikas Nigam Limited (RVNL) regarding the majority shareholding issue for the joint venture (JV) to manufacture Vande Bharat Express train sets. This dispute has led to delays and uncertainty in the expansion plans.

Production delays and capacity shortfall: The Kapurthala Rail Coach Factory, responsible for manufacturing Vande Bharat trains, has faced challenges in meeting production targets. Shortages of raw materials, supply chain disruptions, and delays in the approval of designs has resulted in the factory's failure to deliver the targeted number of trains, leading to delays in expansions.

Operational and maintenance costs: Operating and maintaining Vande Bharat trains involve significant costs, including training staff, ensuring spare parts availability, and implementing regular maintenance schedules. Managing these costs while ensuring efficient operations and high-quality services poses a challenge in the expansion process.

Passenger demand and occupancy: While Vande Bharat trains have been popular among passengers, managing the demand and ensuring optimal occupancy rates can be challenging. Balancing the number of trains and frequencies with passenger demand requires careful planning and analysis.

Weather and operational challenges: Operating Vande Bharat trains in challenging weather conditions, such as during the monsoon season or on steep gradients, can pose operational

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challenges. Special considerations and precautions need to be taken to ensure the trains' safe and reliable operations under such conditions.

> **Read more: Explained: Fast-tracking Vande Bharat**

What should be done?

Resolution of shareholding dispute: The Indian government and the involved parties, Transmashholding (TNH) and Rail Vikas Nigam Limited (RVNL), should work towards resolving the majority shareholding dispute in the joint venture. Finding a mutually acceptable solution will help establish clarity and facilitate smoother progress in the manufacturing and expansion of Vande Bharat trains.

Mitigating the impact of sanctions: Efforts should be made to mitigate the impact of sanctions imposed on Russia by diversifying the supply chain for spare parts. Exploring alternative suppliers from countries unaffected by the sanctions can ensure consistent availability of necessary components for the Vande Bharat trains.

Strengthening manufacturing capabilities: The Rail Coach Factory, Kapurthala, and other relevant manufacturing units should focus on enhancing their production capacities and streamlining their processes. This includes addressing issues related to raw material availability, supply chain management, and timely approvals of designs to meet the production targets and support the expansion plans.

Continuous training and skill development: Training programs should be conducted for staff involved in operating, maintaining, and servicing Vande Bharat trains. Continuous skill development and knowledge enhancement will ensure that the workforce is equipped to handle advanced technology and provide efficient services.

Effective demand management: A comprehensive analysis of passenger demand patterns should be conducted to optimize train frequencies, routes, and capacity.

Weather-resilient designs: Considering the challenges posed by weather conditions, incorporating weather-resilient designs and features in Vande Bharat trains will enhance their operational reliability. This includes addressing concerns related to waterlogging, ensuring safety during monsoons, and facilitating smooth operations on steep gradients.

> **Read more: Not by 'Vande Bharat' alone**

Sources: **The Hindu**, **Business Standard**, Hindustan Times (**Article 1** and **Article 2**), **Livemint** and **The Wire**.

Syllabus: GS – 3: Economic development: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

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[Kurukshetra May 2023 Summary] Fostering Rural Crafts through One District One Product – Explained, pointwise

Introduction

Promoting Rural Crafts through the ODOP (One District One Product) initiative in India has emerged as a powerful strategy for inclusive development and the revival of traditional art forms. ODOP aims to leverage the country's rich demographic dividends by transforming rural areas into thriving entrepreneurial ecosystems. Through ODOP, India embraces its diverse craft heritage while propelling rural artisans towards economic self-reliance and global recognition.

What is the One District One Product (ODOP) Initiative?

The One District One Product (ODOP) initiative is a program implemented by the Indian government to promote inclusive development and empower rural communities through the development and promotion of unique products from each district. Inspired by the Japanese concept of One Village One Product (OVOP), ODOP aims to revive and preserve indigenous art, crafts, and traditional knowledge by creating a sustainable environment for their production. The initiative has gained recognition for its bottomup approach and its contribution to integrated development in India.

The major goals of ODOP are: **(a)** To promote and produce indigenous art and crafts, **(b)** To preserve traditional knowledge, **(c)** To support artisans and craftsmen, **(d)** To support livelihood and employability of rural/local community, **(e)** To boost exports through vocal for local, and **(f)** To attain balanced regional development.

> Read more: **One District One Product Scheme (ODOP)**

What are the various rural crafts that can be promoted through ODOP?

Art and Crafts (Products)	Main Places of Production (City / District / State)
Zari (Zardozi Embroidery)	Surat, Bareilly, Varanasi, Agra, Hyderabad, Lucknow, Vadodara, Lathur, Jaipur, Barmer
Carpet	Bhadohi, Varanasi, Mirzapur, Agra, Jaipur, Bikaner, Kashmir, Panipat, Gwalior, Elluru. In states like West Bengal, Uttarakhand, Karnataka, Andhra Pradesh
Rugs and Durries	Agra, Bhadoi, Mirzapur, Jaipur, Panipat, Kashmir, Bhavani, Navalgund, Warangal, Jaisalmer, Barmer. In states Uttar Pradesh, Rajasthan, Haryana, Tamil Nadu, Karnataka, Andhra Pradesh
Textile (Handloom)	Bahraich, Bhuj, Karimnagar, Patan, Varanasi, Nawan, Shaher, Boudh
Textile (Hand Embroidery)	Lucknow, Barabanki, Unnao, Sitapur, Rae Bareli, Hardoi, Amethi
Textile (Hand Printing)	Hyderabad, Machalipattanam, Varanasi, Farrukabad, Bagh, Behrongarh, Indore, Mandsar, Burhanpur, Ahmedabad, Rajkot, Kutch, Bagru, Chittroli, Sanganer, Jaipur, Jodhpur. In states like Andhra Pradesh, Uttar Pradesh, Odisha, Madhya Pradesh, Gujarat, Maharashtra, Rajasthan
Wood (Carving)	Bhopal, Nagpur, Chennai, Madurai, Mysore, Kashmir. State like Manipur
Wood Inlay	Mysore, Bengaluru, Bijnor, Saharanpur. In states like Punjab, Uttar Pradesh, Karnataka
Wood (Turning & Lacquer Ware)	Etikoppaka, Ernakulam, Chennapatna, Chitrakoot, Davangere, Medak, Sankheda, Varanasi
Stone Cravings	Agra, Bhubaneswar, Puri, Jaisalmer, Cuttack, Cuddapah, Bankura, Kanchipuram, Patna, Mysore, Rajkot, Gwalior, Puducherry, Mahanandi
Stone Inlay	Jodhpur, Jaisalmer, Agra. State like Rajasthan
Cane and Bamboo Crafts	Lakhimpur, Bongaigaon, Guwahati, Agartala, Nelaghar. In states like Assam, West Bengal, Odisha, Arunachal Pradesh, Manipur, Arunachal Pradesh, Tripura
Pottery and Clay Objects	Asharikandi, Bulandshahar, Bhadrawati, Nizamabad, Pune, Chandrapur. State like Assam
Terracotta	Several parts of India like Pottery
Horn and Bone Work	Lucknow, Moradabad, Sambhal, Sarai Tarin, Honawar, Gajapati, Jodhpur, Thiruvananthapuram. In states like Uttar Pradesh, Odisha, Rajasthan, Kerala
Folk Paintings	In states like Odisha, West Bengal, Madhya Pradesh, Rajasthan, Bihar, Gujarat, Andhra Pradesh
Conch-Shell Crafts	In states like West Bengal, Tamil Nadu
Theatre, Costumes and Puppet	In states like Odisha, Karnataka, Andhra Pradesh, Tamil Nadu, Bihar, Kerala

Source: Kurukshetra

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What are the prospects and benefits of promoting rural crafts through ODOP?

Source: Kurukshetra

Market expansion and increased sales: Access to the ODOP GeM Bazar and e-commerce platforms enhance market reach. Artisans can sell their products nationally and internationally, leading to increased sales and revenue.

Preservation of cultural heritage: ODOP promotes indigenous arts and crafts, safeguarding traditional knowledge and skills. Crafts such as Rogan arts, Mithila paintings, and Wood carvings are preserved and passed down through generations.

Socio-economic empowerment: Supporting artisans and craftsmen improves their livelihood and employability. Rural communities benefit from increased income and reduced poverty levels.

Boosting exports and enhancing India's image: ODOP aligns with the "vocal for local" initiative, leading to increased exports of local crafts. Handloom textiles, pottery, and other products gain international recognition, enhancing India's reputation as a cultural hub.

Regional development and balanced growth: ODOP ensures balanced regional development by focusing on every district's unique product. By promoting crafts across various regions, ODOP prevents the concentration of growth in urban areas.

Skill development and quality improvement: Support from ODOP leads to skill development among artisans, enhancing their craftsmanship. Through training and guidance, product quality improves, making rural crafts more competitive in the market.

Increased visibility and international exposure: Showcasing ODOP products at international platforms, such as the World Economic Forum, brings global attention. Crafts like Phad paintings, Terracotta, and Handloom textiles gain exposure, attracting international buyers.

Self-reliance and Aatmanirbhar Bharat: Promoting rural crafts aligns with the goal of self-reliance and strengthens India's economy. ODOP contributes to India's self-sufficiency by supporting local artisans and reducing dependency on imports.

Tourism and cultural promotion: Unique crafts under ODOP, such as Kathputli paintings and Tanjore paintings, attract tourists, promoting cultural tourism. Visitors are drawn to regions known for their distinct crafts, boosting local economies and preserving cultural heritage.

> **Read more:** [Kurukshetra May 2023 Summary] Potential of rural handicrafts and rural tourism – Explained, pointwise

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What are the government initiatives in promoting rural crafts through ODOP?

One District One Product (ODOP) Scheme: The ODOP scheme implemented by the central government focuses on developing and promoting a unique product from each district, aiming to create a brand identity and boost exports.

Districts as Export Hub (DEH) initiative: The DEH initiative, launched by the Directorate General of Foreign Trade (DGFT) under the Department of Commerce, aims to transform districts into export hubs by identifying products with export potential.

ODOP GeM Bazar: The ODOP GeM Bazar is a government e-marketplace that promotes the sale and procurement of ODOP products across the country.

Support for marketing and international collaboration: ODOP products are showcased in international platforms like the World Economic Forum, allowing artisans to gain exposure and recognition on a global scale. This enables rural crafts to reach international markets and enhances the export potential of these products.

Institutional mechanisms: The government has established State Export Promotion Committees (SEPC) and District Export Promotion Committees (DEPC) to provide institutional support and address issues related to export promotion. Through these committees, artisans and craftsmen receive guidance, assistance, and necessary interventions to improve their marketing strategies, access funding, and overcome challenges in promoting their crafts to both domestic and international markets.

Foreign trade policy 2023: The Government of India has unveiled the Foreign Trade Policy 2023, which focuses on new potential export areas and highlights the role of districts as export hubs.

> Read more: **Mission to map rural India's cultural assets covers over one lakh villages**

What are the challenges faced in promoting rural crafts through ODOP?

Poor institutional arrangements and support: Many artisans struggle to access financial support or find it difficult to navigate bureaucratic procedures when seeking assistance for their craft enterprises.

Inaccessible funds and financial constraints: Limited availability of financial institutions or schemes specifically tailored to the needs of artisans and craftsmen.

Ineffective backward and forward linkages for marketing: Due to this, artisans may find it challenging to reach a wider customer base due to a lack of marketing channels or difficulty in establishing connections with wholesalers or exporters.

Low adoption of technology and modern techniques: Limited access to and awareness of technological advancements in design, production, and marketing. This limits the competitiveness in the contemporary market.

Lack of marketing skills and intelligence: Artisans may face challenges in identifying market demands, pricing their products appropriately, or effectively promoting their crafts to attract a wider customer base.

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Sustainability and Environmental Concerns: The challenge lies in preserving the authenticity of rural crafts while adopting sustainable practices such as using natural dyes, responsibly sourced materials, or minimizing waste generation.

What should be done to promote rural crafts through ODOP effectively?

Create a conducive ecosystem: Improve coordination and collaboration between various government departments, financial institutions, and industry experts to create a conducive ecosystem for rural crafts.

Accessible and tailored financial assistance: Simplify loan procedures and ensure the availability of accessible credit facilities to meet the financial requirements of rural craft businesses.

Enhance Marketing: Develop robust marketing strategies, including market research, branding, and effective promotion techniques, to expand the reach of rural crafts.

Foster market linkages: Foster strong backward and forward linkages by connecting artisans with potential buyers, retailers, exporters, and e-commerce platforms to increase market access.

Skill Development and Technological Integration: Provide training programs and skill development initiatives to empower artisans with marketing skills, entrepreneurship training, and knowledge of modern production techniques. Also facilitate the adoption of technology in rural craft production, including digital tools, e-commerce platforms, and online marketing channels, to enhance competitiveness.

Collaboration and Partnerships: Foster collaborations between artisans, government agencies, industry associations, and non-profit organizations to create synergies and share best practices. Apart from this, there is a need to facilitate international collaborations and partnerships to expand market opportunities for rural crafts through trade fairs, exhibitions, and cultural exchange programs.

Monitoring and Evaluation: Regularly monitor and evaluate the impact of ODOP initiatives, identifying bottlenecks and areas for improvement. Collect feedback from artisans and craft communities to ensure their voices are heard and their needs are addressed effectively.

Source: Kurukshetra

Syllabus: GS 3: Economic development: Indian Economy and issues relating to planning, mobilization, of resources, growth, development and employment.

Recent development in India – Nepal relations – Explained, pointwise

Introduction

The recent visit of the Nepali Prime Minister to India has highlighted the ongoing developments in India-Nepal relations. The visit aimed to strengthen bilateral ties and address various issues of mutual concern. Both countries have shown a willingness to enhance cooperation in areas such as trade, infrastructure, and hydroelectric power. The visit signifies a positive step towards building a stronger and more prosperous relationship between India and Nepal. However, concerns and challenges persist in this relationship.

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What are the recent developments in India – Nepal relations?

Improvement in relations: After a period of strain during the tenure of the past Prime Minister, relations between India and Nepal have been improving. The change in leadership in Nepal has contributed to the positive trajectory.

High-level visits: There have been several high-level visits between India and Nepal, indicating the efforts to strengthen bilateral ties. Nepalese Foreign Secretary visited New Delhi, and Indian Foreign Secretary visited Kathmandu, focusing on enhancing cooperation and resolving contentious issues.

Energy cooperation: India and Nepal have signed agreements to boost cooperation in the energy sector. India is involved in the development of several hydropower projects in Nepal, including the Arun III, Arun-4, Upper Karnali, Seti River 6, and West Seti projects. Long-term power trade agreements have been signed, aiming to import 10,000 MW of electricity from Nepal to India over the next 10 years.

Infrastructure projects: Both countries are working on infrastructure projects to improve connectivity. Recently, India Prime Minister and his Nepalese counterpart remotely unveiled the Kurtha-Bijalpura section of the railway line, virtually flagged off a cargo train from Bathnaha (India) to Nepal Customs Yard and inaugurated Integrated Checkposts (ICPs) at Nepalgunj in Nepal and Rupaidiha on the Indian side.

Cultural and religious ties: Efforts have been made to strengthen cultural and religious ties between India and Nepal. The expedited development of projects related to the Ramayana circuit has been discussed, reflecting the shared cultural heritage between the two countries.

Geopolitical dynamics: India is seeking to counter China's influence in Nepal through economic diplomacy and by expanding cooperation in various sectors.

> **Read more: [India, Nepal sign pacts on energy, transport](#)**

What are the areas of Cooperation between India – Nepal relations?

> **Read here: [India-Nepal Relationship – Explained, pointwise](#)**

What are the growth factors of India – Nepal relations?

Shared cultural and religious heritage: India and Nepal share a deep cultural and religious bond, which has been a significant growth factor in their relations. The cultural and religious ties between the two countries have played an important role in keeping the relations intact at the people's level. For example, the transport of Shilas (stones) from the Kaligandaki River in Nepal to Ayodhya in India for the construction of the Ram Mandir symbolizes the religiosity and cultural oneness between the two nations.

People-to-people connectivity: The open-border system and close people-to-people connection between India and Nepal have been vital in fostering vibrant and dynamic relations. The ease of movement and exchange of goods and services have created strong ties between the two countries.

Economic cooperation: Economic cooperation has emerged as a significant growth factor in India-Nepal relations. India has been involved in various development projects in Nepal, particularly in the energy sector.

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Connectivity and infrastructure development: Both countries have focused on enhancing connectivity and infrastructure development, which has contributed to the growth of their relations.

Geopolitical dynamics: India's efforts to counter China's influence and check its growing presence in Nepal have led to increased engagement and cooperation between India and Nepal. India's economic diplomacy and focus on expanding economic cooperation with Nepal are aimed at maintaining its strategic interests in the region.

What is the importance of India to Nepal and vice versa?

Source: Maps of India

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India's importance to Nepal:

Economic dependence: Nepal relies on India for trade and transportation of goods, as well as access to sea routes.

Cultural and religious Ties: India and Nepal share a deep cultural and religious heritage, which strengthens their social bonds.

Assistance and support: During times of crisis, such as the 2015 earthquake and pandemic, India has provided significant aid and support to Nepal.

Infrastructure development: India's involvement in infrastructure projects, such as hydropower, contributes to Nepal's economic growth and development.

Security cooperation: India plays a crucial role in ensuring the security and stability of Nepal, supporting its defense and border management.

Nepal's importance to India:

Strategic location: Nepal shares a border of about 1850 km with five Indian States – Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Sikkim, making it an important buffer state for India's security interests.

Connectivity: Nepal provides a crucial transit route for India to connect with other neighbouring countries and enhance regional connectivity.

Cultural and religious tourism: Nepal attracts a significant number of Indian tourists, especially for pilgrimage and religious purposes.

Energy cooperation: Nepal's hydropower potential can contribute to India's energy requirements, fostering cooperation in the energy sector.

Regional stability: A stable and friendly Nepal is essential for India's overall regional stability and influence.

What are the potential benefits of India – Nepal relations?

Economic growth: Cooperation between India and Nepal promotes trade, investment, and economic development, leading to improved living standards and job opportunities.

Infrastructure development: Joint initiatives contribute to the development of infrastructure projects like hydropower plants and transportation networks, boosting connectivity and trade facilitation.

Energy security: Nepal's hydropower potential can provide clean and renewable energy to India, enhancing energy security and reducing dependence on fossil fuels.

Cultural exchange: Strong cultural ties foster people-to-people connections, tourism, and mutual understanding, enriching the cultural fabric of both nations.

Security cooperation: Collaboration in security matters ensures border stability, counter-terrorism efforts, and intelligence sharing, promoting regional security.

Humanitarian assistance: During times of crisis, such as natural disasters and pandemic , India's support and aid to Nepal demonstrate solidarity and humanitarian cooperation.

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Countering China's influence in the region: By maintaining a close relationship, India can help Nepal navigate its relations with China, ensuring that Nepal's interests are protected and balanced between the two neighboring powers. This helps prevent any undue dominance or overreliance on China, promoting Nepal's sovereignty and maintaining regional stability.

> **Read more: [China's growing influence in Nepal means India's diplomacy and project delivery will need to improve](#)**

What are the challenges faced in developing India – Nepal relations?

Geopolitical rivalry: The presence of geopolitical rivalries, particularly between India and China, poses challenges to the development of India-Nepal relations. These rivalries can impact the dynamics and create tensions in the region.

Political instability: Nepal's frequent political instability, characterized by changes in government and power-sharing arrangements, creates challenges in maintaining a consistent and stable relationship with India.

Border disputes: Boundary disputes, such as the delineation of territories like Kalapani and Lipulekh, create challenges and strains in India-Nepal relations. These disputes can lead to tensions and hinder the development of a strong partnership.

Meddling and perceptions: Reports of Indian meddling in Nepali politics and a perceived "Big Brother" behaviour have at times strained relations and created negative perceptions among Nepali parties and politicians.

China's influence: China's expanding role in Nepal presents a challenge to India-Nepal relations. India needs to counter China's influence by strengthening its economic cooperation with Nepal and fostering closer ties.

Economic disparities: India's ability to invest in Nepal may be limited compared to China, leading to economic disparities. Bridging these gaps and ensuring equitable economic cooperation can be a challenge in the relationship.

> **Must read: [Kalapani territorial dispute between India and Nepal](#)**

What should be done?

Strengthen bilateral engagement: Both India and Nepal should prioritize strengthening bilateral engagement through regular high-level visits, diplomatic dialogue, and people-to-people exchanges. This will help build trust and understanding between the two nations.

Address border disputes: India and Nepal should engage in constructive dialogue to address and resolve border disputes, such as the delineation of territories like Kalapani and Lipulekh. Finding mutually acceptable solutions will contribute to a more stable and cooperative relationship.

Avoid meddling and favouritism: India should refrain from interfering in Nepal's internal political affairs and avoid perceived favouritism towards specific political parties. A neutral and unbiased approach will contribute to a more balanced and harmonious relationship.

Counter China's influence: India should proactively counter China's growing influence in Nepal by strengthening its economic cooperation and infrastructure projects in the country. This will help mitigate any negative impact and maintain a healthy balance of power in the region.

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Focus on long-term interests: Both India and Nepal should focus on the long-term interests and benefits associated with their relations. Building a strong and sustainable partnership based on mutual trust, shared prosperity, and common aspirations will pave the way for a brighter future for both nations.

> **Read more:** [How To Be A Pal – on India Nepal Relations](#)

Sources: [Indian Express](#), [Financial Express](#), [Economic Times](#), [The New Indian Express](#), Outlook India ([Article 1](#) and [Article 2](#)) [ORF](#) and [Deccan Herald](#).
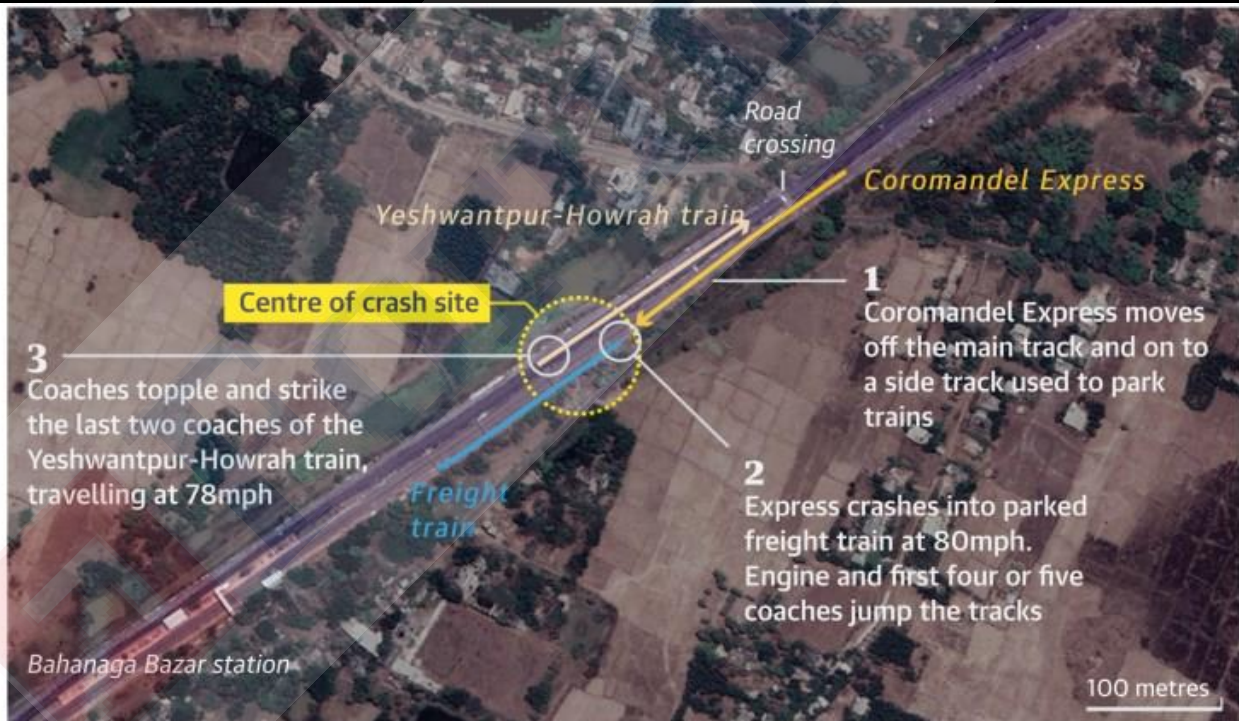
Syllabus: GS 2: International Relations – India and Neighbourhood relations.

The Issue of Indian railway safety – Explained, pointwise

Introduction

The issue of Indian railway safety has come under scrutiny following a recent Balasore tragic accident. This incident has raised concerns about the lapses in safety measures within the Indian railway system. It highlights the urgent need for comprehensive reforms and improved safety protocols to ensure the well-being of passengers and prevent such devastating accidents in the future.

About the recent train accident and its reason
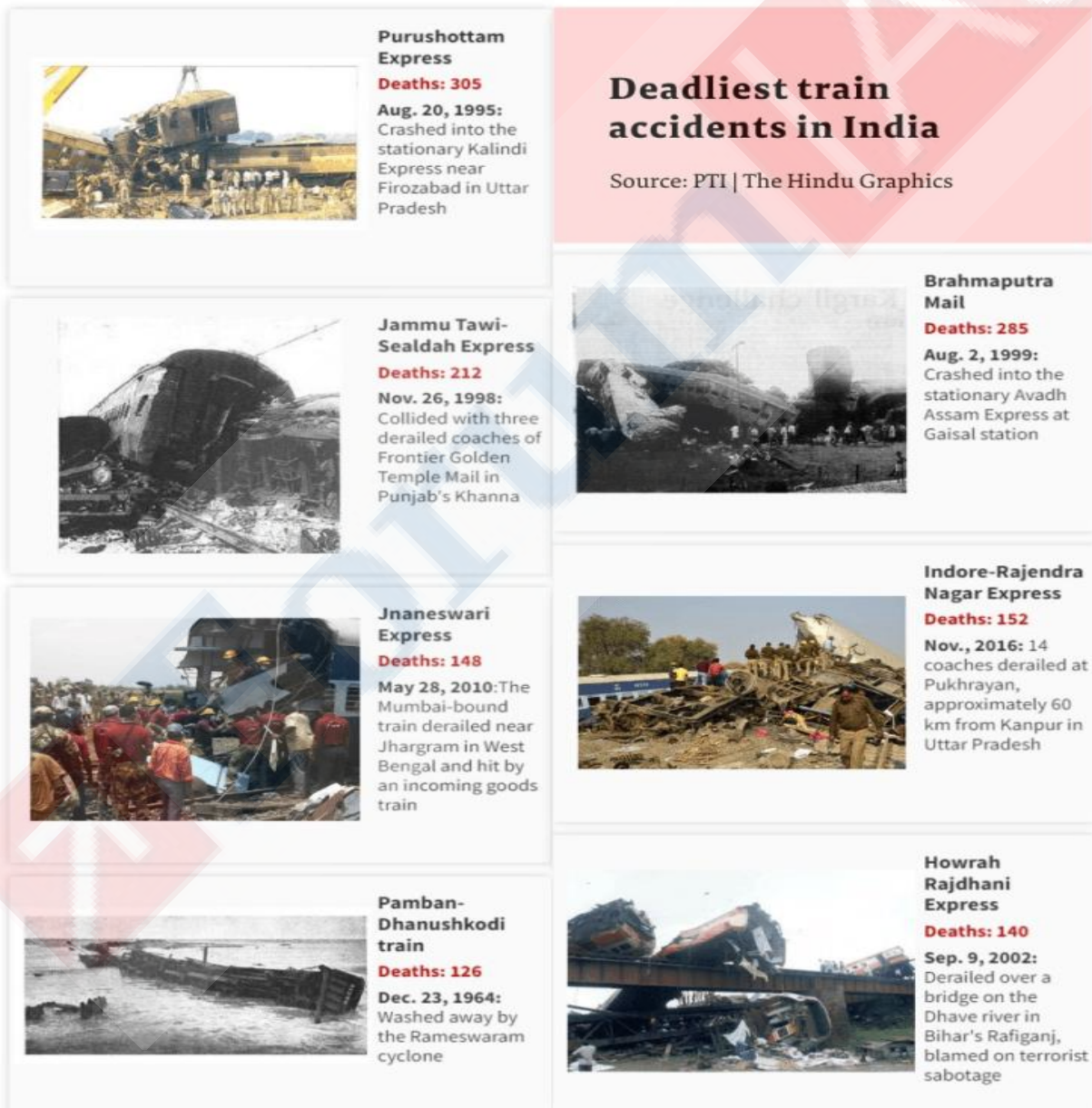

Source: The Guardian

In a recent train accident in Balasore, Odisha, three trains collided, resulting in a high number of casualties and injuries. The collision occurred when the Chennai-bound Coromandel Express

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veered off its track and crashed into a stationary goods train. The impact caused the passenger train's coaches to derail and hit another passenger train travelling in the opposite direction.

The preliminary investigation suggests that a technical glitch with the signalling system may have been the reason for the accident. The Railways authorities have identified the root cause and responsible parties and are taking steps to rectify the issue. This tragic incident highlights the ongoing challenges of rail safety in India and the need for improvements to prevent such accidents in the future.

What are the previous train accidents due to lapses in Indian railway safety?

According to the National Crime Records Bureau, an average 23,000 people died every year between 2010 and 2021 in railway accidents. These accidents were due to,

Deadliest train accidents in India

Source: PTI | The Hindu Graphics

Purushottam Express
Deaths: 305
Aug. 20, 1995: Crashed into the stationary Kalindi Express near Firozabad in Uttar Pradesh

Brahmaputra Mail
Deaths: 285
Aug. 2, 1999: Crashed into the stationary Avadh Assam Express at Gaisal station

Jammu Tawi-Sealdah Express
Deaths: 212
Nov. 26, 1998: Collided with three derailed coaches of Frontier Golden Temple Mail in Punjab's Khanna

Jnaneswari Express
Deaths: 148
May 28, 2010: The Mumbai-bound train derailed near Jhargram in West Bengal and hit by an incoming goods train

Indore-Rajendra Nagar Express
Deaths: 152
Nov., 2016: 14 coaches derailed at Pukhrayan, approximately 60 km from Kanpur in Uttar Pradesh

Pamban-Dhanushkodi train
Deaths: 126
Dec. 23, 1964: Washed away by the Rameswaram cyclone

Howrah Rajdhani Express
Deaths: 140
Sep. 9, 2002: Derailed over a bridge on the Dhave river in Bihar's Rafiganj, blamed on terrorist sabotage

Source: The Hindu

Derailments: Derailments have been a major cause of train accidents in India. Lapses in safety protocols, track maintenance, and failure to identify and rectify track defects have resulted in derailments. For example, the derailment of the **Puri-Haridwar Utkal Express in 2017**, which claimed 23 lives and injured many, was attributed to negligence in track maintenance.

Collisions: Train collisions have occurred due to lapses in signalling systems, human errors, and failure to maintain safe distances between trains. One such incident was the collision between the **Gorakhdham Express and a halted goods train in Uttar Pradesh, in 2014,** resulting in a high number of casualties and injuries.

Level crossing accidents: Lapses in ensuring the safety of level crossings have led to accidents involving trains and road vehicles. Failure to eliminate manned level crossings, inadequate warning systems, and negligence in adhering to safety procedures have contributed to such accidents. For instance, in 2011, 38 people have been killed and 17 others injured in a **train-bus collision in the Kanshiramnagar district of Uttar Pradesh.**

Signal failures: Malfunctioning or improper signalling systems have been responsible for train accidents. Inadequate maintenance, faulty equipment, and human errors in signalling operations have resulted in collisions and other mishaps. The collision of **two trains in Gaisal, West Bengal (1999**), occurred due to a signalling error.

Overcrowding and overspeeding: Overcrowding of trains beyond their capacity and overspeeding have also led to accidents. Lack of proper crowd management and failure to enforce speed limits have been significant safety concerns. **The 2018 Amritsar train accident**, where a train struck a crowd watching a Dussehra event near the railway tracks, causing numerous fatalities, highlighted the risks associated with overcrowding.

> **Read more: [Kurukshetra May Summary] Railway Connectivity – Explained, pointwise**

Why the safety of Indian Railways is paramount?

High volume of passengers: India is the fourth-largest rail network in the world at 68,043 km and almost 3.5 billion people travel on this network annually. With a massive population and millions of people relying on the railways for their daily commute, ensuring the safety of Indian Railways becomes crucial. The railways carry a significant volume of passengers, and any safety lapse can have catastrophic effects, as witnessed in past accidents.

Economic impact: Indian Railways is a crucial component of the country's transportation infrastructure and plays a vital role in the economy. Any disruption or safety-related issues can lead to economic setbacks, affecting industries, businesses, and overall development.

Lifeline for economic migrants: Trains are the lifeline for a bulk of India's poorer economic migrants. Their ability to move and improve their economic prospects has a positive impact on their home states through remittances. The economic survey used unreserved railway travel as a proxy for economic migration between 2011 and 2016 and concluded that the annual average inter-state migration was close to nine million.

Reputation and public trust: The safety of Indian Railways is essential to maintain the public's trust and confidence in the system. Instances of accidents and safety lapses can erode the reputation of the railways and result in passengers losing faith in the reliability and security of train travel.

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International comparison: Safety standards in Indian Railways are often compared with those of developed countries. Countries like Japan, China, and several European nations have demonstrated that high safety standards are achievable. The focus on safety is not only crucial for passenger well-being but also to align with global best practices and enhance India's image on the international stage.

Connectivity: Indian Railways is a lifeline for connectivity, ensuring people from various regions can travel and access opportunities for economic growth. Safety is crucial for fostering economic development, enabling the seamless movement of goods, and attracting investments.

Regulatory compliance: Safety is a regulatory requirement and a legal obligation for Indian Railways. Adhering to safety protocols and regulations is not only necessary to prevent accidents but also to comply with national and international standards, ensuring the railways operate within a framework that safeguards the well-being of passengers.

What are various government initiatives to address the Indian railway safety concerns?

Train accidents across India are broadly in decline

■ Derailments ■ Collisions ■ Unmanned level crossing ■ Manned level crossing ■ Fire ■ Other
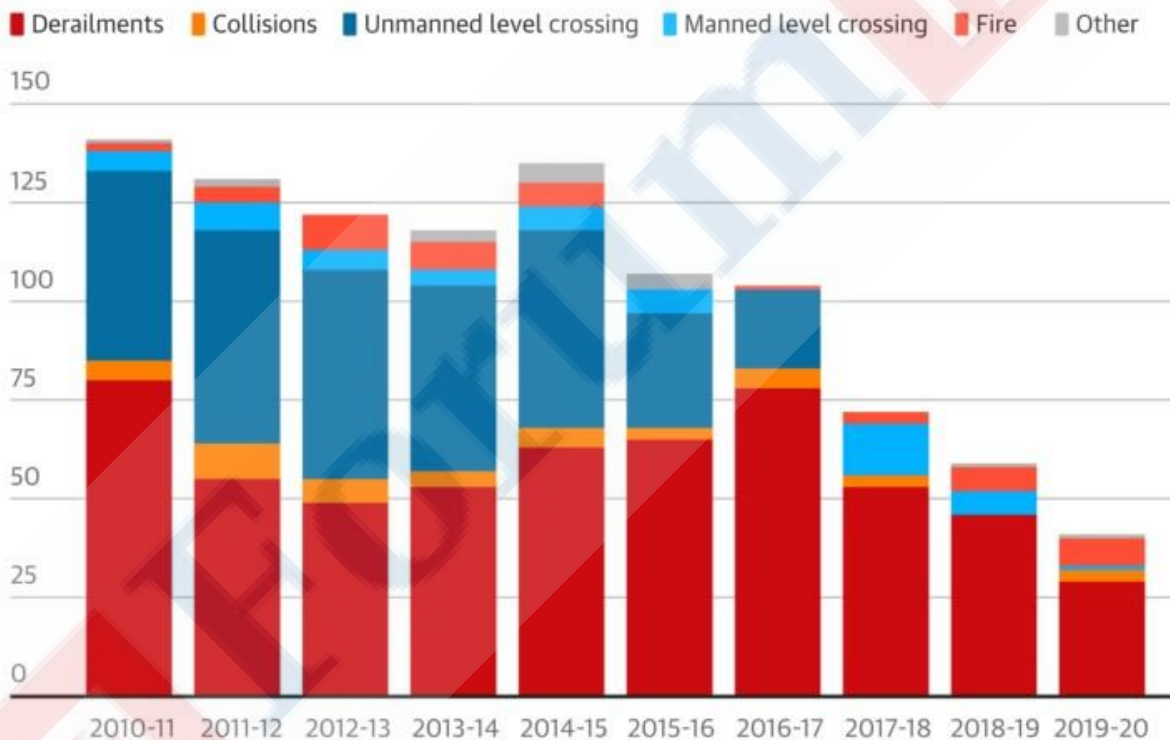
Guardian graphic. Source: Dhaval Desai at Observer Research Foundation. Note: accidents involving loss of life, injury, loss to railway property or interruption to rail traffic above specified Indian Railways thresholds

Source: The Guardian

Kavach system: KAVACH is an indigenously developed Automatic Train Protection(ATP) System for Indian Railways.

Rashtriya Rail Sanraksha Kosh (RRSK): The government initiated the RRSK in 2017-18, a dedicated fund aimed at carrying out safety-related work in a systematic manner.

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Project Mission Raftar: It is an Indian Railway project, introduced in the Railway Budget of 2016-17 and approved by NITI Aayog in 2017. The goal is to double the average speed of freight trains and increase passenger train speed by 50%. While the focus is on improving speed, it indirectly contributes to safety by reducing travel time and potentially minimizing the risks associated with prolonged journeys.

Upgradation of infrastructure: The government has been investing significant funds in the modernization and upgradation of railway infrastructure. This includes the electrification of railway lines, the expansion of rail networks, and the introduction of high-speed and ultra-high-speed lines, such as the Vande Bharat Express.

Implementation of safety measures: Efforts have been made to implement safety measures across the railway network. These include the installation of fire and smoke detection systems in coaches, the provision of fire extinguishers, and the development of technologies like the Kavach application that aids locomotive pilots in triggering the brake system automatically.

Elimination of manned level crossings: The government has been working towards the elimination of manned level crossings, which are prone to accidents. Efforts are being made to replace them with underpasses, overpasses, and other safety measures to enhance railway safety.

Audit reports and recommendations: The Comptroller and Auditor General of India (CAG) periodically conducts audits of Indian Railways, identifying shortcomings and making recommendations to address safety concerns. These reports serve as a basis for corrective actions and improvements in safety protocols.

> **Read more: Vande Bharat trains: Potential and Challenges – Explained, pointwise**

What are the challenges in ensuring the safety of Indian railways?

Technical glitches and system failures: The occurrence of technical glitches and system failures, such as the electronic interlocking error in the Balasore train crash, poses a significant challenge to ensuring the safety of Indian Railways. These issues can lead to signalling errors, track misalignment, and other critical safety hazards.

Funding constraints and prioritization: The allocation and utilization of funds for safety-related works face challenges. The decline in funding for track renewal, diversion of funds to non-priority tasks, and constraints in the Rashtriya Rail Sanraksha Kosh pose obstacles to effectively addressing safety concerns.

Inadequate maintenance and inspections: The CAG audit reports highlight shortcomings in maintenance activities, inspections, and track renewal processes. Shortfalls in inspections, failure to submit or accept inquiry reports after accidents, and declining funding for track maintenance contribute to safety concerns.

Congestion and overcrowding: The Indian Railways network experiences severe congestion, especially on major trunk routes, leading to overcrowded trains and increased risks. The high volume of passengers and inadequate capacity utilization can impact safety protocols and create challenges in managing passenger flow during emergencies.

Compliance and implementation: Ensuring compliance with safety protocols and timely implementation of safety measures across the vast railway network is a complex challenge. The

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need for strict adherence to scheduled timelines for accident inquiries, acceptance of inquiry reports, and effective monitoring mechanisms is emphasized in the reports.

Human Factors: Human error, such as incorrect setting of points, mistakes in shunting operations, and overspeeding, has been identified as a significant factor contributing to train accidents.

What should be done?

Conduct thorough investigations: It is essential to conduct comprehensive and timely investigations into train accidents to identify the root causes and determine accountability. This includes submitting and accepting inquiry reports within prescribed timelines and ensuring that the findings are made public for analysis and discussion.

Strengthen maintenance practices: Prioritize track maintenance, inspections, and infrastructure upgrades to prevent derailments and ensure safe operations. Implement mechanized methods of track maintenance and leverage improved technologies to enhance the efficiency and effectiveness of maintenance activities.

Allocate sufficient funding: Ensure adequate funding for safety-related works, including track renewal, signalling systems, and infrastructure upgrades. Proper utilization of funds from initiatives like the Rashtriya Rail Sanraksha Kosh (RRSK) should be ensured to address safety priorities effectively.

Enhance staffing and training: Address staffing shortages in safety-related positions and provide comprehensive training programs for staff members involved in train operations. Focus on improving skills, knowledge, and adherence to safety protocols to minimize human errors.

Implement advanced technologies: Embrace advanced technologies, to enhance safety monitoring, early detection of faults, and real-time decision-making.

Prioritize safety as a culture: Foster a safety culture across the Indian railways by emphasizing the importance of safety at all levels. Encourage reporting of safety concerns, promote safety awareness and education among staff and passengers, and instil a sense of responsibility for safety in every aspect of railway operations.

Sources: **Live Mint**, Business Standard (**Article 1** and **Article 2**), Times of India (**Article 1**, **Article 2**, **Article 3** and **Article 4**), Indian Express (**Article 1** and **Article 2**) and **The Hindu**

Syllabus: GS 3: Economic development: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

[Yojana May 2023 Summary] Digital health: leveraging technology for transforming health care – Explained, pointwise

Introduction

Digital health is a rapidly growing field in the global health sector. Various terms like e-health, telehealth, telemedicine, and health apps are used interchangeably with digital health. The landscape of digital health is expanding, encompassing mobile health (mHealth), digital data management, teleconsultations, wearable devices, and more. The growth of digital health

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interventions has been accelerated by factors like the COVID-19 pandemic, increasing smartphone penetration, and investments in healthcare IT infrastructure.

What is digital health?

Digital health is a multidisciplinary framework that involves the integration of software, hardware, and services to provide healthcare solutions. It encompasses the use of disruptive technologies that provide digital and objective data accessible to both caregivers and patients. The goal of digi health is to establish an equal-level doctor-patient relationship, shared decision-making, and democratization of care. It focuses on improving the quality, efficiency, and accessibility of healthcare services through technology interventions.

What are the components of digital health?
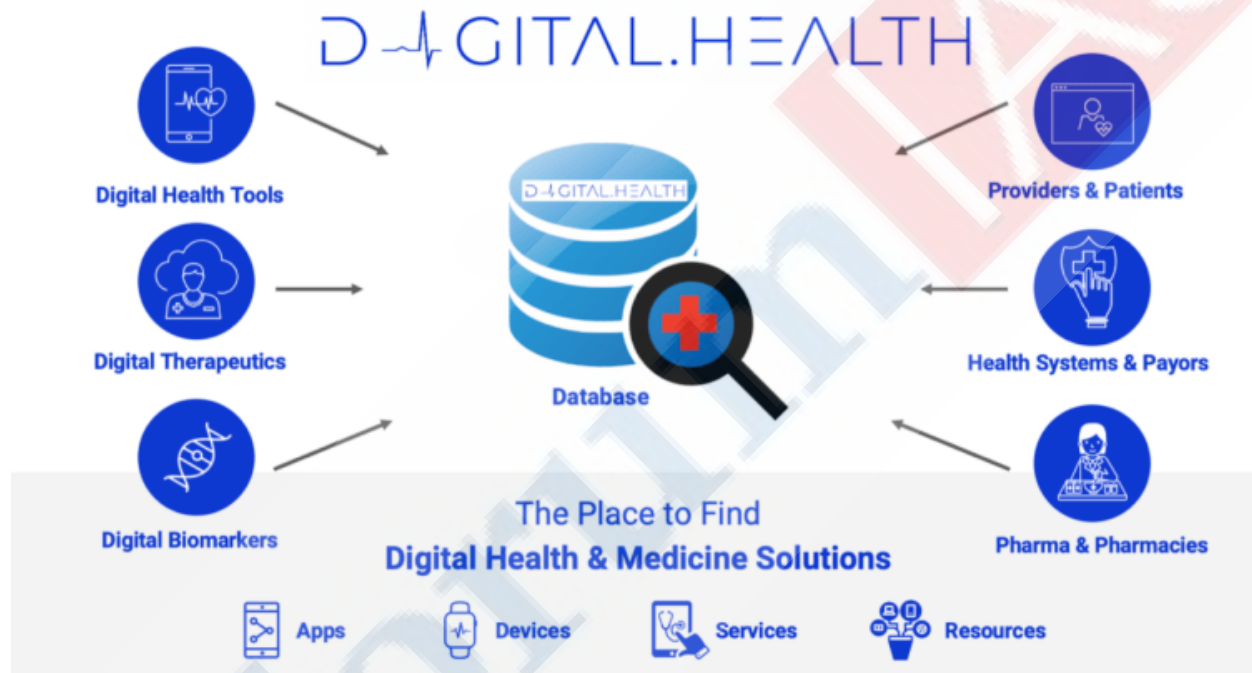
Source: Digital Health

Digital health comprises various components, including:

Software applications: Health apps, electronic medical records (EMR), and health informatics platforms are part of the digital health ecosystem.

Hardware devices: Wearable health devices with sensors, mobile devices, and tablets with customized software applications are used for healthcare services.

Services: Telemedicine, teleconsultations, and telehealth platforms enable the delivery of healthcare services using information and communication technologies. These services facilitate diagnosis, treatment, prevention, research, evaluation, and continuing education of healthcare providers.

Note: *Telemedicine refers to the delivery of healthcare services using information and communication technologies when distance is a critical factor. It involves the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries. Telemedicine also facilitates research, evaluation, and continuing education for healthcare providers. It enables*

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remote consultations, making healthcare accessible to individuals who may not have easy physical access to healthcare facilities.

How has the growth of digital health interventions been fuelled?
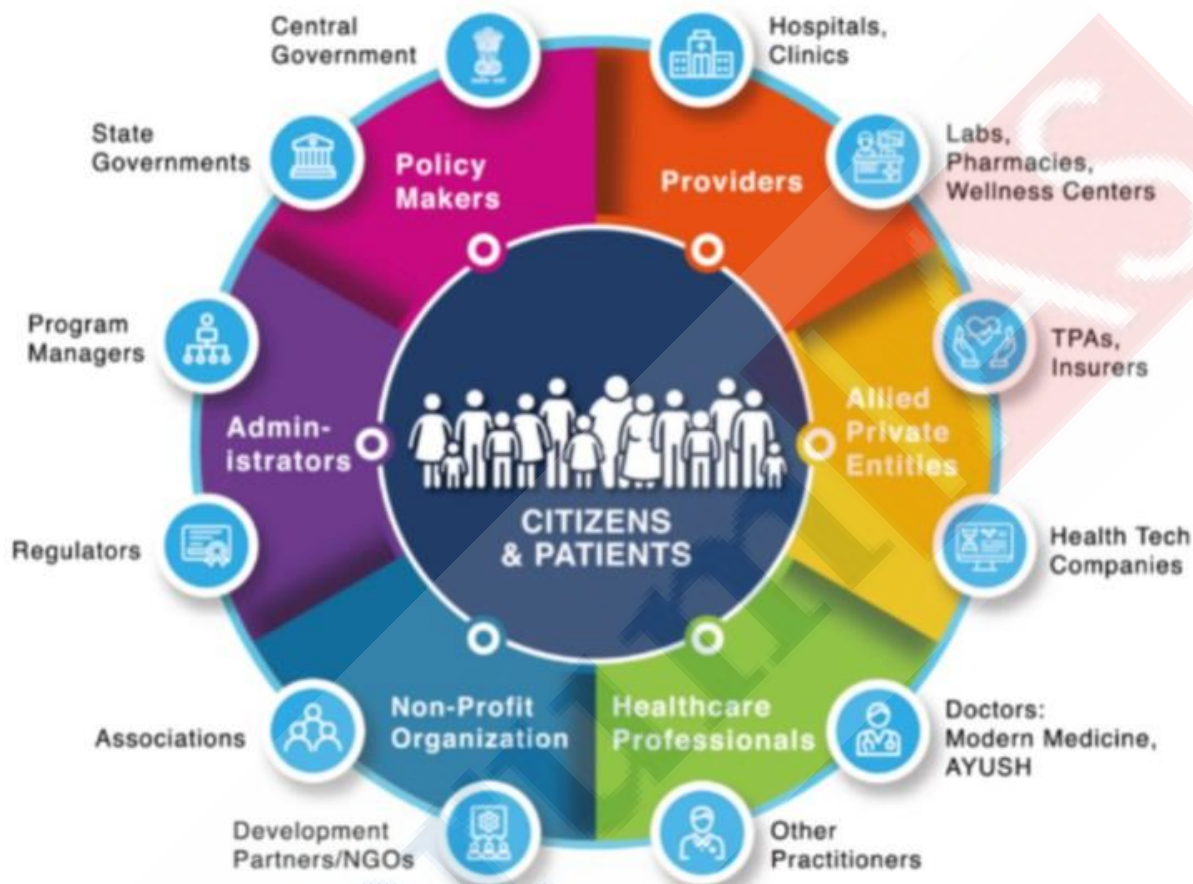
Source: National Health Authority

Impact of the global pandemic: During the global pandemic, the healthcare sector received heightened attention and priority, leading to a significant boost in the adoption of digital health interventions. Telemedicine platforms and remote monitoring solutions saw a substantial increase in usage as they enabled healthcare providers to remotely monitor patient health and provide care.

Increasing smartphone penetration: The widespread use of smartphones across the globe has played a crucial role in the growth of digital health interventions. Mobile health apps and platforms have made healthcare more accessible and convenient for individuals. These apps allow users to monitor their health parameters, access medical information, and even consult with healthcare professionals remotely. For instance, apps that track and manage chronic diseases like diabetes or provide fitness guidance have become popular among users.

Rapid investments in healthcare IT infrastructure: Developing and developed nations have made substantial investments in healthcare IT infrastructure, further fueling the growth of digital health interventions. These investments have created a robust foundation for the

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implementation of digital solutions and have facilitated the integration of various healthcare systems.

Prevalence of chronic diseases: The increasing prevalence of chronic diseases, such as diabetes, cardiovascular diseases, and cancer, has driven the demand for digital health solutions. These solutions offer personalized care plans, remote patient monitoring, and improved patient engagement, enhancing the management of chronic conditions.

What are the advantages of digital health?

Equity and inclusion in healthcare: Digital health interventions have significantly improved access to healthcare services, particularly for individuals in remote or underserved areas. Telemedicine and teleconsultation services allow patients to receive medical advice and treatment from the comfort of their homes, reducing the need for travel and long waiting times. Furthermore, digital health interventions can cater to diverse populations by providing multilingual platforms and accommodating various cultural and linguistic preferences.

Enhanced patient engagement and empowerment: Digital health solutions empower patients by providing them with access to their health information and tools to actively manage their health. Health apps and wearable devices enable individuals to track their vital signs, monitor their progress, and make informed decisions about their well-being.

Efficient and streamlined healthcare delivery: The adoption of digital tools in healthcare has led to increased efficiency and streamlined processes. Electronic medical records (EMRs) and health informatics platforms enable healthcare providers to access and share patient information seamlessly, reducing paperwork and eliminating errors associated with manual record-keeping.

Cost savings for patients and healthcare systems: Digital health interventions have the potential to reduce healthcare costs for both patients and healthcare systems. By minimizing the need for in-person consultations and hospital visits, telemedicine and remote monitoring solutions can lower out-of-pocket expenses for patients. Additionally, digi health technologies improve operational efficiency and resource allocation in healthcare institutions.

Enhanced quality of care and outcomes: Digital health interventions enable healthcare providers to deliver personalized and evidence based care. Access to real-time patient data, health analytics, and decision support tools help healthcare professionals make informed clinical decisions, leading to improved treatment outcomes and patient safety.

Advancements in medical research and innovation: Digital health platforms and data analytics contribute to medical research and innovation by facilitating the collection and analysis of large-scale health data. This data-driven approach supports evidence-based decision-making, clinical trials, and the development of new treatments and interventions.

What are the government initiatives in digital health?

Ayushman Bharat Digital Mission (ABDM): Launched by the Government of India, ABDM aims to develop an integrated digital health infrastructure that connects various stakeholders in the healthcare ecosystem. It focuses on providing a wide range of data, information, and infrastructure services while ensuring the security and privacy of health-related personal information.

CoWIN: The Covid Vaccine Intelligence Network (CoWIN) system serves as the technological backbone of India's Covid-19 vaccination program. It enables citizens to book vaccination

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appointments, facilitates vaccine stock management, and generates digital vaccination certificates. CoWIN has played a crucial role in the administration of millions of vaccine doses across the country.

Tele-MANAS: Telemental Health Assistance and Networking Across States (Tele-MANAS) is an initiative that provides free mental health services through video consultations with mental health specialists. It aims to offer counseling, medical interventions, follow-up services, and linkages to in-person care, particularly in remote areas and for vulnerable populations.

Ni-kshay 2.0 Portal: The Ni-kshay 2.0 Portal is a digital platform launched by the Indian government to support community involvement in tuberculosis (TB) care. It enables the registration of TB patients and facilitates additional support from donors, including diagnostic services, nutritional aid, and vocational support. The platform enhances the management and monitoring of TB patients' needs.

Health Technology Assessment (HTA): Under the Department of Health Research, the Health Technology Assessment in India (HTAIn) serves as an institutional arrangement for evidence-based decision-making in health. HTAIn evaluates the clinical effectiveness and cost-effectiveness of health technologies, medicines, and programs. It supports the formulation of health policies and the efficient allocation of resources.

Sanjeevani app: The Sanjeevani app is a telemedicine and teleconsultation platform launched by the Government of India. It has been widely recognized for its extensive medical services, especially during the Covid-19 pandemic. The app enables remote consultations between doctors and patients, providing access to healthcare services from the comfort of one's home. It has been instrumental in expanding the reach of healthcare and ensuring timely medical support, particularly in rural and hard-to-reach areas.

> Must read: Ayushman Bharat Digital Health Mission – Explained, pointwise

Conclusion

Digi health has emerged as a transformative force in the healthcare sector, driven by advancements in technology and increased accessibility to healthcare services. It offers numerous advantages such as improved access to care, cost-effectiveness, enhanced efficiency, and better health outcomes. Government initiatives like Ayushman Bharat Digital Mission and the Sanjeevani app have played a pivotal role in advancing digi health interventions and benefiting a large population. The future of healthcare looks promising with the continued growth of digital health.

Source: Yojana

Syllabus: GS 2: Social Justice: Issues relating to development and management of Social Sector/Services relating to Health.

Plastic ban in India: Progress so far – Explained, pointwise

Introduction

The ban on single-use plastic in India has been a significant step towards addressing the plastic waste crisis and promoting sustainability. Since the ban was imposed, the government has taken various measures to enforce the regulations and raise awareness about the harmful impacts of

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plastic pollution. However, challenges persist, including the availability of affordable alternatives, resistance from certain sectors, and the need for improved waste management infrastructure. Despite these challenges, progress has been made, but there is still a long way to go in achieving a plastic-free India.

About the decision for Plastic ban in India

The progress of the plastic ban in India has been driven by various legislative actions and global incidents that have highlighted the need for environmental conservation. The Plastic Waste Management and Handling Rules of 2011 laid the foundation for waste management, while the Plastic Waste Management Rules of 2016 focused on extended producer responsibility and plastic waste management strategies. In July 2022, the government imposed a ban on 19 single-use plastic items under the **Plastic Waste Management Amendment Rules, 2021**.

This ban aligns with the global movement to combat plastic pollution, like, the United Nations Environment Assembly (UNEA 5.2). It has also been influenced by countries like Rwanda and Kenya, which have also implemented similar measures

What is the rationale behind the decision to plastic ban in India?

Plastic pollution crisis: India generated approximately 34.7 lahks (3.47 million) tonnes of plastic waste in 2019 and 2020. The escalating levels of plastic waste and its adverse effects on ecosystems, including marine pollution, prompted the need for urgent action.

Insufficient recycling capacity: The recycling capacity in India is reported to be only half of the total plastic waste generated. A significant portion ends up in landfills, rivers, and oceans, exacerbating the environmental challenges.

Global concerns and international initiatives: The United Nations Environment Assembly (UNEA) established an Intergovernmental Negotiating Committee (INC) to draft an international legally binding instrument to address plastic pollution. This global focus on tackling plastic waste influenced India's decision to take measures to combat the issue domestically.

Increasing per capita plastic waste: Plastic consumption in the country has risen at a compounded annual growth rate (CAGR) of 9.7 per cent to 14 MT in the financial year 2016-17 to 20 million tonnes in 2019-20. This alarming trend emphasizes the urgent need to address the issue and reduce plastic consumption.

Health hazards: Single-use plastic, particularly when used for food and beverage packaging, poses significant health risks. Plastic chemicals, such as phthalates and bisphenol A (BPA), can leach into food and beverages, potentially causing endocrine disruption and other adverse health effects when consumed.

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What is the progress made on single-use plastic ban in India?

1999 | First law on plastic waste management covers manufacture, sale and use. Bans carry bags less than 20 microns in thickness, and sale of food in recycled plastic

2003 | Rules amended, diluting curbs on carry bags

2011 | Plastic Waste (Management and Handling) Rules notified. Ban on use of plastic sachets for gutkha, tobacco and pan masala. Carry bags less than 40 microns in thickness banned

2016 | New Plastic Waste Management (PWM) Rules notified. They talk about making manufacturers, importers and brand-owners responsible. Two-year deadline to phase out multi-layered plastics proposed, but industries oppose it

2018 | Rules amended in April over industry concerns due to dearth of alternatives. In June, PM Modi pledges to phase out single-use plastic (SUP) by 2022

2019 | Standard guidelines for SUP issued. India bans entry of imported solid plastic scrap in SEZs and export-oriented units

2021 | PWM rules amended to define SUP

2022 | EPR, or extended producer responsibility, guidelines notified for recycling. Some SUP items banned from July 1. Carry bags of less than 120 microns in thickness banned from Dec 31

INDIA'S WAR ON PLASTIC

STEPS TAKEN TO MAKE PLASTIC BAN WORK

➤ Enforcement of ban on manufacturing and sale of SUP articles

➤ Petrochemical industry told to stop supplying raw material to manufacturers of banned SUP goods

➤ Customs told to stop import of banned SUP articles

➤ Leading e-commerce companies (Big Basket, Amazon, Flipkart, etc.) told to stop sale/use of SUP articles on their platform

➤ Penalties like environmental compensation, permit cancellation and closure of operations slapped on violators

Fine upto : One Lakh
Sarojini Nagar Mini Market Traders Association

BANNED PLASTIC ARTICLES

➤ Flags
➤ Candy sticks
➤ Ice cream sticks
➤ Earbuds
➤ Sticks for balloons
➤ Polystyrene (thermocol) for decoration
➤ Plates, cups, glasses, forks,

spoons, knives, straws, trays, etc.

➤ Wrapping or packaging films around sweet boxes, invitation cards and cigarette packets

➤ Banners thinner than 100 microns

➤ Carry bags thinner than 120 microns

UNPLASTIC INDIA
An initiative of The Times of India

Take the pledge to eliminate single-use plastic. Join the **21-day Unplastic India Challenge** to adopt plastic-free choices for a better tomorrow. For details, visit **www.unplasticindia.com** or scan the QR code.

THE ROAD AHEAD

➤ Promote alternatives to single-use plastic (SUP)
➤ Create awareness on phasing out of SUP

➤ Certify manufacturers of compostable plastics
➤ Help petro-based SUP manufacturers

transition to alternatives
➤ Test alternative to plastic made from farm stubble at Indian Institute of Science

Source: TOI

Ban implementation: Regulatory agencies have conducted raids and spot-checks to seize banned single-use plastic items. For example, authorities in cities like Delhi, Mumbai, Bangalore, and Gurugram have reported seizing plastic items and imposing fines on violators.

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Increased awareness: The ban has raised public awareness about the environmental impact of single-use plastics. Awareness campaigns have been conducted to educate the public about the need to reduce plastic waste. For instance, during the Durga Puja festival in Kolkata, several pandals (temporary structures) showcased the theme of plastic and marine pollution to raise awareness.

Development of alternatives: The ban has stimulated the development and availability of alternative products. Like, several companies have started producing biodegradable and compostable alternatives to single-use plastic items such as bags, cutlery, and packaging materials.

Public participation: Citizens have actively engaged in reporting violations through apps and other platforms, aiding enforcement efforts. The Central Pollution Control Board launched **the SUPCPCB app**, which allows citizens to report the use of single-use plastics. This public participation helps in identifying and taking action against violators.

State-level initiatives: Some states have taken proactive steps to enforce the ban and curb the use of single-use plastics. For example, in Bihar, the Bihar State Pollution Control Board has implemented measures to address the issue of single-use plastics.

Transition to sustainable practices: Businesses and individuals have started adopting sustainable practices. For instance, several restaurants and food outlets have switched to eco-friendly alternatives such as paper straws, compostable cutlery, and biodegradable packaging materials.

> Read more: [Plastic ban failure – Managing plastic waste needs a multi-pronged strategy](#)

What are the steps taken by the government to enforce single-use plastic ban in India?

Plastic waste management rules (2016 and amendment 2021): The government took legislative action to address single-use plastic by imposing a ban on specific items, including spoons, straws, plates, and polythene bags. The ban was implemented in stages, with a prohibition on plastic bags less than 75 microns thick taking effect on September 30, 2021. To strengthen the ban further, bags less than 120 microns thick were prohibited from December 31, 2022.

Extended Producer Responsibility (EPR): The concept of EPR was introduced as part of the government's strategy. Under EPR provisions, manufacturers, brand owners, and importers became responsible for managing the plastic waste generated from their products. They were required to establish systems for the collection and recycling of plastic waste to ensure environmentally sound disposal and reduce the burden on the environment.

Plastic waste management infrastructure: This involves improving waste collection, segregation, recycling, and disposal infrastructure. Investments are being made in recycling facilities and promoting circular economy models to reduce plastic waste and promote responsible plastic management.

Incentives and support: To facilitate the transition away from single-use plastics, the government provided support and incentives to businesses. Micro, small, and medium enterprises (MSMEs) were offered capacity-building workshops and technical assistance to develop alternatives to banned plastic items.

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Collaboration and coordination: To effectively implement the ban, the government collaborated with market committees and trade bodies. By working together, government agencies, non-profit organizations, and civil society groups aimed to address the plastic pollution challenge more comprehensively.

Awareness campaigns: To educate the public about the harmful effects of single-use plastic and promote sustainable alternatives, the government organized public events and launched extensive awareness campaigns.

> **Read more: India has made little progress in managing its plastic waste**

What are the challenges faced while enforcing single-use plastic ban in India?

> **Read here: India's ban on select single-use plastic items: A start but still a long way from blanket ban and Single-use plastic ban: Reading the fine print reveals ominous loopholes**

What should be done?

For a successful plastic ban

If laws are not enforced appropriately then compliance is reduced or eliminated

ENFORCEMENT

COLLECTION / DISPOSAL
Plastic bag bans and waste disposal systems have to be tackled together

ALTERNATIVES

LOOPHOLES

BLACK MARKET

Providing sustainable alternatives is essential for a successful plastic ban

There is a chance of a black market emerging in places where plastic has been banned

It is crucial to identify loopholes while drafting the legislation

Source: Hindustan Times

↗ Forum**IAS**

Strict enforcement of the ban: Governments at all levels, including local, state, and national, need to ensure the strict enforcement of the ban on single-use plastic. This requires dedicated resources, monitoring mechanisms, and penalties for non-compliance. Authorities should conduct regular inspections, impose fines on violators, and take legal action against repeat offenders.

Public awareness and education: Awareness and educational campaigns can be conducted through various channels, including schools, universities, mass media, and social media platforms. The focus should be on changing people's behaviour and promoting the use of sustainable alternatives.

Promote sustainable alternatives: The availability and affordability of sustainable alternatives to plastic, such as paper bags, cloth bags, and biodegradable materials, need to be increased. Governments can provide incentives and support to businesses that produce and use eco-friendly packaging materials. This can include tax breaks, subsidies, and grants for research and development of innovative solutions.

Improve waste management infrastructure: Governments should invest in waste management facilities, recycling plants, and recycling awareness programs. This will help in reducing the amount of plastic waste that ends up in landfills, water bodies, and the environment.

Encourage industry responsibility: Industries and companies that produce and use plastic should take responsibility for their waste. Extended Producer Responsibility (EPR) programs can be implemented. This can incentivize companies to reduce plastic packaging, invest in recycling technologies, and promote sustainable practices throughout their supply chains.

International cooperation: Plastic pollution is a global issue that requires collaboration among nations. Governments should engage in international agreements and partnerships to address the problem collectively. Sharing best practices, knowledge, and technologies can accelerate progress in reducing plastic pollution.

Research and innovation: Continuous research and innovation are vital to finding sustainable alternatives to plastic and developing more efficient recycling methods. Governments, academic institutions, and private sectors should invest in research and development initiatives focused on finding innovative solutions to plastic pollution.

> **Read more: [Beating plastic pollution (On plastic waste management rules)](#)**

Syllabus: GS 3: Environment and Bio-diversity: Environmental pollution and degradation.

Sources: Times of India (**Article 1**, **Article 2** and **Article 3**), **ORF**, **DW**, **Indian Express**, **DTE**, **Scroll** and **Tribune**

Law Commission's recommendations on sedition and its relevance – Explained, pointwise

Introduction

The 22nd Law Commission's recommendations on sedition have recently stirred huge debate. The Commission advocated amendments instead of repeal, the Commission sought to refine the law to ensure alignment with past Supreme Court (SC) judgments and to appropriately calibrate punishments.

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These recommendations have significant implications as they strive to balance the necessity of preserving national security and stability with the crucial democratic value of freedom of speech. However, concerns persist about the potential misuse of the law, its impact on dissent and democratic discourse, and the ambiguity surrounding its application.

What is Sedition?

Evolution of the law

Sedition is a cognisable, non-bailable and non-compoundable offence under Section 124A of Indian Penal Code

BEFORE INDEPENDENCE

1870: The section on sedition is introduced by the British to the IPC

The British rulers used the law to muzzle demands for freedom. For instance, Bal Gangadhar Tilak was the first person to be convicted of sedition in colonial India.

AFTER INDEPENDENCE

1948: In discussions, Indian leaders agree to drop "sedition" from the Constitution

1949: "Sedition" is no longer part of the Indian Constitution adopted on November 26 this year. However, Section 124A remains in the IPC

1951: Nehru govt brings in first amendment under Article 19(1)(a), and puts in "reasonable restrictions" on the right to free speech

1974: Indira Gandhi govt makes Section 124A a cognisable offence that authorises police to make arrests without a warrant

PRESENTLY

2019 data shows that sedition cases rose by 25% and arrests by 41% over the previous year. However, only 3% of cases led to convictions

Source: Hindustan Times

Must read: [Section 124 A or Sedition law](#)

What are the Law Commission's recommendations on sedition?

Law Commission's recommendation

- Punishment for anybody who brings or attempts to bring in "hatred or contempt", or excites "disaffection" towards the government, "with a tendency to incite violence or cause public disorder"

- "Tendency" means mere inclination to incite violence or cause public disorder rather than proof of actual violence or imminent threat to violence

- Alternative jail term increased from up to 3 years to up to 7 years

- Model guidelines by central government to introduce procedural safeguards to prevent misuse of law

- Amendment in CrPC to ensure no FIR is registered without preliminary enquiry and government permission for registering FIR

Source: Law Commission of India

The Print

Source: The Print

Amendment rather than repeal: The Law Commission recommends amending, rather than repealing, Section 124A of the Indian Penal Code (IPC). This is based on their belief that the elimination of this law could pose a threat to the country's security and integrity.

Alignment with Kedar Nath verdict: The Commission proposes that the amendment should align with the SC 1962 Kedar Nath verdict. This judgment stipulates that there must be a 'pernicious tendency to incite violence' to invoke the sedition law, safeguarding against its misuse for stifling free speech.

Incorporation of 'Tendency' concept: The recommended amendment to Section 124A incorporates the concept of a 'tendency to incite violence or cause public disorder', as clarified in the Kedar Nath judgment. The term 'tendency' refers to a mere inclination to incite violence or cause public disorder.

Procedural safeguards: The Law Commission suggests adding procedural safeguards to prevent misuse of the Sedition law. These may include a revision to Section 154 of the Criminal Procedure Code stipulating that an FIR under Section 124A can only be registered following a preliminary inquiry by a police officer and subsequent approval by the central or state government.

Must read: [Sedition law can be retained but with safeguards: Law Commission](#)

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What are the reasons for the recommendation of strong sedition law by the Law Commission?

Read here: **The reasons Law Commission gave while recommending a stronger sedition law**

What are the recommendations of other commissions and judgments on sedition?

Contentious history

Section 124 A of the IPC penalises sedition as punishable with either imprisonment ranging from 3 yrs to a lifetime, a fine, or both

- Sedition law was introduced by the British in 1870, and almost dropped from the Constitution in 1948

- The word "sedition" disappeared from the Constitution on November 26, 1949 and Article 19 (1)(a) gave absolute freedom of speech and expression. However, Section 124A continued to stay in IPC.

- In 1951, Jawaharlal Nehru brought in the first amendment of the Constitution to limit the freedom under Article 19(1)(a) and enacted Article 19(2) to empower the State to put curbs in the form of "reasonable restrictions" on right to free speech.

- In its judgment in the Kedar Nath case in 1962, a Constitution bench upheld the validity of the sedition law. The bench held that Section 124A only penalised words that reveal an intent or tendency to disturb law and order or that seem to incite violence. This definition has been taken as precedent for all matters pertaining to section 124A ever since.

- According to the NCRB data, uploaded on its website, cases of sedition and under the stringent Unlawful Activities (Prevention) Act showed a rise in 2019, but only 3% of the sedition cases resulted in convictions.

Source: Hindustan Times

Recommendation of the 21st law commission: The 21st Law Commission of India also dealt with the question of sedition. While it didn't provide an explicit recommendation, it released a consultation paper in 2018 seeking public views on the sedition law.

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The consultation paper suggested that every irresponsible exercise of the right to free speech and expression should not be termed seditious in a democracy. The Commission expressed concern that the sedition law should not be misused to suppress free speech, an essential element of a vibrant democracy.

Various Judgements on Sedition

Kedar Nath Singh vs Bihar (1962): The SC in the landmark judgement of Kedar Nath Singh vs Bihar in 1962 upheld the validity of the sedition law. However, it clarified that the application of the law should be limited only to acts involving intention or tendency to create disorder, or disturbance of law and order, or incitement to violence. This interpretation added a crucial qualifier to the sedition law – mere criticism of the government could not be termed as sedition unless it incited violence.

Balwant Singh vs Punjab (1987): In another important judgement, Balwant Singh vs Punjab, the SC held that mere words or slogans against the State which do not lead to violence cannot lead to invocation of section 124A IPC. In this case, two individuals were acquitted of sedition charges for shouting pro-Khalistan slogans on the day Indira Gandhi was assassinated. The court stated that raising of some lonesome slogans, a couple of times, which neither evoked any response nor any reaction from anyone in the public, would not amount to sedition.

Shreya Singhal vs Union of India (2015): In the case of Shreya Singhal vs Union of India in 2015, the SC held that vague and over-broad offences would be unconstitutional. While this case was primarily dealing with Section 66A of the IT Act, it set a precedent for laws restricting freedom of speech and expression, including the sedition law. The court ruled that any law, including those pertaining to sedition, which infringes on the right to free speech, must not be vague and must be as minimal as possible in its restriction of speech.

What are the concerns associated with the Law Commission's recommendations on sedition?

Risk of misuse due to the addition of 'Tendency': The Law Commission has suggested an amendment that includes a 'tendency' to incite violence as part of the sedition law. However, this introduces a new risk of misuse.

For example, any expression that may be interpreted as an inclination towards causing disorder could lead to sedition charges, even if no actual violence or public disorder occurs. This could potentially result in silencing critics of the government under the guise of maintaining public order.

Contradiction with prior supreme court rulings: The Commission's recommendation appears to contradict previous judgments of the SC. For instance, in the case of **Balwant Singh vs Punjab in 1987**, the Supreme Court ruled that merely raising slogans against the state can't be considered as a ground for applying section 124A IPC.

Contrary to this, the Commission's recommended language for the amendment may allow the invocation of sedition charges in such scenarios.

Risk of unconstitutionality due to vague offences: The report fails to consider the implications of the Shreya Singhal judgment (2015) where the SC declared that vague and over-broad offences could be unconstitutional. The Court maintained that such laws couldn't be considered a reasonable restriction on free speech. Despite this, the Commission's recommendations do not address this potential unconstitutionality.

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Dismissing the relevance of comparative jurisdictions: The Commission's report dismisses the importance of learning from international experiences with sedition laws, stating that the Indian context is unique. However, this dismissive approach could prevent the application of beneficial insights and best practices from jurisdictions that have handled similar legal challenges. For example, the UK abolished its sedition law in 2009 considering it obsolete, which might a pertinent point of discussion in the Indian context.

> **Read more: [Law Commission's sedition recommendations: Silencing what's left of dissent](#)**

What should be done?

Clarification and amendment: There seems to be a strong consensus that Section 124A of the IPC, which defines the sedition law, needs to be clarified and amended. This includes aligning it with the SC 1962 verdict in the Kedar Nath Case.

Re-evaluating SC Judgments: Some concerns were raised regarding the Commission's interpretation of various SC judgments related to sedition. It might be prudent to reassess these judgments and their implications on the sedition law, including the Kedar Nath judgment, the Balwant Singh judgment, and the Shreya Singhal judgment.

Addressing constitutional challenges: The ongoing constitutional challenges to the sedition law need to be addressed. The report by the Law Commission seems to have disregarded these challenges. A comprehensive review of the law should take into account these challenges and precedents to ensure the law is in line with constitutional principles.

Considering societal context: The SC has noted that the sedition law might not be in tune with the current societal context. This suggests a need for a broader dialogue about the role of the sedition law in contemporary Indian society. There is a need to consider the factors such as changes in communication technology, social media, and evolving norms around free speech and dissent in this respect.

Sources: The Hindu (**[Article 1](#)**, **[Article 2](#)** and **[Article 3](#)**), Times of India (**[Article 1](#)**, **[Article 2](#)** and **[Article 3](#)**), **[The Quint](#)**, **[Live Law](#)**, **[Indian Express](#)**, and **[Hindustan Times](#)**.

Syllabus: GS 2: Indian Constitution and Polity – Criminal Justice System.

An analysis of PLI (production-linked incentive) scheme – Explained, pointwise

Introduction

The Production-Linked Incentive (PLI) scheme, a government initiative aimed at promoting domestic manufacturing and attracting investments, brings forth diverse perspectives. This includes criticism from renowned economist Raghuram Rajan.

Rajan has raised concerns regarding the potential risks associated with overreliance on fiscal subsidies and has emphasized the need for a comprehensive approach to address underlying structural issues in the manufacturing sector.

While the PLI scheme intends to spur job creation and boost investment, it is crucial to examine both the positive aspects and the challenges associated with its implementation to assess its overall effectiveness.

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About the PLI Scheme

Source: PIB

The PLI scheme is a financial initiative launched by the Indian government to boost domestic manufacturing and make it globally competitive. It began in March 2020, covering mobile manufacturing and IT hardware initially, and has since expanded to include 14 sectors such as pharmaceuticals, telecom, food products, automobiles, textiles, and drones. The scheme offers subsidies based on additional investments, incremental sales, and value additions.

Must read: **Production-Linked Incentive or PLI Schemes and its challenges – Explained, pointwise**

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What are the achievements of the PLI Scheme so far?

Source: Ingressgc

Increased export growth: Under the PLI scheme, sectors such as electronics, automobiles, pharmaceuticals, white goods, and textiles have witnessed significant growth in exports. For example, exports of electronic goods increased by 57.36 percent during March 2023 at USD 2.86 Billion as compared to USD 1.82 Billion in March 2022.

Attracting investments: The PLI scheme has successfully attracted both domestic and foreign investments in various sectors. Companies have shown interest in setting up manufacturing facilities in India to leverage the incentives provided by the scheme. For instance, The 20 automobile companies have proposed a total investment of around Rs. 45,000 crores (US$ 5.95 billion).

Job creation: The PLI scheme has played a crucial role in generating employment opportunities across sectors. For example, the drone manufacturing sector alone is expected to create more than 10,000 direct jobs, while the textile sector is estimated to create over 7.5 lakh additional jobs

Incremental production and investments: The PLI scheme has stimulated incremental production and investments in targeted sectors. It is expected to bring in incremental investment of INR 7,920 crore and incremental production worth INR 1,68,000 crore

Improving India's "Global Manufacturing Rankings": India's efforts towards manufacturing growth, including the PLI scheme, have been recognized globally. India secured second position after China in the Global Manufacturing Risk Index 2021, reflecting the progress made in the manufacturing sector.

Contribution to GDP: The PLI scheme is expected to have a positive impact on India's GDP. It is estimated to add 1.7% to the country's GDP by 2027, generating significant economic growth and contributing to overall prosperity.

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Read more: **PLI scheme push: Electronics is India's fastest-growing export**

What are the challenges faced during the implementation of the PLI Scheme?

Regulatory hurdles: Despite efforts to simplify the regulatory environment, Indian businesses often grapple with red tape, bureaucratic hold-ups, and complex regulatory requirements that can slow down or complicate the implementation of the PLI scheme. Achieving consistency and transparency in policy regulations across states and sectors is a challenge.

Infrastructure bottlenecks: Infrastructure gaps, especially in terms of power, logistics, and connectivity, can pose significant challenges to companies looking to scale their operations under the PLI scheme. Inadequate infrastructure can increase operational costs and hamper competitiveness.

Access to capital: Despite the financial incentives provided by the PLI scheme, businesses, especially small and medium-sized enterprises, often face difficulties in accessing affordable capital. This can limit their ability to invest in new technologies, expand capacity, or upgrade their infrastructure.

Skills gap: While India boasts a large workforce, there's a notable shortage of highly-skilled labour, particularly in advanced technology sectors targeted by the PLI scheme.

Lack of advanced technology: The adoption of advanced technologies, which is essential for competitiveness in many of the targeted sectors, is still relatively low in India. The cost and complexity associated with technology adoption can pose challenges for companies looking to benefit from the PLI scheme.

Geopolitical factors: Fluctuations in global trade dynamics and geopolitical tensions can impact the outcomes of the PLI scheme. For instance, trade restrictions, tariffs, or changes in the global supply chain can affect the export potential of companies benefiting from the scheme.

Structural issues in the economy: Structural issues, such as small-scale operations, regulatory constraints, and fragmented supply chains, can hinder the effectiveness of incentive schemes like the PLI.

Read more: **What critics of the govt miss: Not much is lost if the PLI scheme fails**

What are the concerns against PLI Scheme?

While the PLI scheme has been lauded for its potential to boost India's domestic manufacturing sector, there are several concerns that critics have raised:

Selective sector focus: Critics argue that the PLI scheme's focus on selected sectors may lead to a distortion in the allocation of resources. The scheme could create an uneven playing field where some sectors enjoy more benefits than others.

Dependence on subsidies: There's a concern that the PLI scheme may create industries that are dependent on government subsidies for their survival. This could potentially lead to long-term problems, as these industries may not be competitive without ongoing government support.

Implementation challenges: Implementing the PLI scheme effectively across diverse sectors could be challenging. The administration needs to ensure that the benefits reach the intended recipients, which requires a robust infrastructure and a high level of administrative efficiency.

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Fiscal burden: The scheme involves substantial financial outlays by the government. Critics argue that this could increase the fiscal burden on the government, especially in a post-pandemic economy where resources are stretched thin.

Regional Trade Agreements (RTA): Critics argue that by focusing on domestic manufacturing, the Indian government may be missing out on opportunities presented by regional trade agreements. They contend that participation in RTAs could expose India to larger markets and international supply chains.

Attracting quality investments: While the scheme is designed to attract investments, there are concerns about whether it will attract high-quality investments that can lead to technology transfers and improvements in productivity.

Environmental concerns: As industries scale up their manufacturing capabilities under the PLI scheme, there will be an increased need for sustainability and environmental conservation measures. Balancing growth with environmental responsibility could pose a challenge.

> **Read more: [Testing times for PLI schemes: Covid-related delays put firms in pressure](#)**

What should be done to improve manufacturing?

Invest in infrastructure: Efficient logistics and infrastructure are vital for a robust manufacturing sector. This involves improving transportation networks (road, rail, air, and sea), streamlining port processes, improving power supply, and building efficient industrial clusters.

Improve "Ease of Doing Business": Reducing bureaucratic red tape, simplifying regulations, and providing a clear and stable policy environment can make it easier for businesses to operate, invest, and expand their manufacturing capabilities.

Boost skills and innovation: Encourage and invest in technical and vocational education and training to build a skilled workforce. In addition, promoting research and development can foster innovation, which can drive productivity growth in the manufacturing sector.

Promote digital transformation: Leveraging Industry 4.0 technologies such as AI, IoT, and automation can improve efficiency, reduce costs, and boost the competitiveness of the manufacturing sector.

Enhance access to capital: Making it easier for manufacturers to access affordable capital can spur investment in new technologies and capacity expansion.

Review trade policies: Evaluate existing free trade agreements (FTAs) to ensure they benefit the domestic manufacturing sector. Also, consider engaging in FTAs that provide Indian manufacturers with access to global markets.

Sustainable manufacturing practices: Adopt and promote sustainable and green manufacturing practices. This not only helps in environment conservation but also opens up new markets for sustainable products.

Sources: **[The Hindu](#)**, **[Invest India](#)**, **[The Hindu Businessline](#)**, **[Livemint](#)**, **[Hindustan Times](#)**, **[The New Indian Express](#)**, **[Business Standard](#)**, **[Economic Times](#)**, **[Fortune India](#)** and **[Indian Express](#)**.

Syllabus: GS 3: Economic development: Changes in industrial policy and their effects on industrial growth.

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Regulating AI (Artificial Intelligence): Need and way forward – Explained, pointwise

Introduction

The recent visit of Sam Altman, the CEO of OpenAI, to India has reignited the discussion on the need for regulating Artificial Intelligence (AI). With AI rapidly advancing and its potential impact on society, there is a growing consensus among experts that regulation is necessary to ensure responsible and ethical use of AI technology.

As countries like India, the European Union, the United States, and Japan are actively working on regulations, it is crucial to explore the need for AI regulation and chart a way forward that balances innovation and societal well-being.

Why there is a need to regulate AI?

Bias and discrimination: AI systems can inherit biases from the data they are trained on, leading to discriminatory outcomes. For example, facial recognition algorithms have been shown to have higher error rates for women and people with darker skin tones.

Lack of transparency: Many AI algorithms operate as black boxes, making it difficult to understand how they reach their decisions. This lack of transparency raises concerns about accountability and the potential for unfair or biased outcomes.

Lack of accountability: The responsibility and accountability for AI decisions can be unclear, especially when complex systems are involved. This poses challenges in determining liability in case of AI-related accidents or harm caused by AI systems.

Privacy and data protection: AI systems often rely on vast amounts of personal data, raising concerns about privacy and data protection. Improper handling of data can result in unauthorized access, misuse, or breaches of sensitive information.

Security risks: AI systems can be vulnerable to cybersecurity threats and attacks. Adversarial attacks can manipulate AI models to produce incorrect or malicious results, posing risks in critical domains such as autonomous vehicles or healthcare.

Ethical considerations: AI raises ethical questions related to the impact on jobs, social inequality, and the concentration of power. For example, automated decision-making in hiring processes may perpetuate existing biases and result in unfair outcomes.

Lack of regulation and standards: The rapid advancement of AI has outpaced the development of comprehensive regulatory frameworks and industry standards. This creates a regulatory gap and potential risks associated with unchecked AI development and deployment.

> **Must read: [What is Generative AI? Highlight its implications?](#)**

What are the various options for regulating AI?

Soft law approach: Soft law approaches include options such as guidelines, best practices, industry standards, etc. This can be more flexible and adaptable to the rapidly evolving AI landscape. Soft law can provide initial guidance without imposing rigid regulations.

Graduated regulation: Implement a regulatory framework that takes into account the size and capacity of AI companies. Differentiate between large, established companies and smaller startups, applying more stringent regulations to the former while allowing the latter some flexibility to encourage innovation.

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Regulatory sandboxes: Create regulatory sandboxes or controlled environments where startups and small companies can experiment with AI technologies under supervision. This allows for innovation while ensuring compliance with basic ethical and safety standards.

Collaboration with the tech community: Engage with the tech community, including startups and small companies, in the regulatory process. The governments should seek input and feedback to better understand their unique challenges and ensure that regulations are practical and effective.

A balance between hard and soft Law: Strike a balance between hard law (legislation and binding regulations) and soft law (guidelines and standards) to create a regulatory framework that is both enforceable and adaptable to technological advancements.

Global regulatory cooperation: Foster international collaboration to establish a unified global regulatory framework for AI. This can involve engaging with other countries and international organizations to develop common standards, principles, and guidelines that can be adopted universally.

> **Must read: Generative AI (Artificial Intelligence): Benefits and Challenges – Explained, pointwise**

What are the advantages of regulating AI?

Ethical use and accountability: Regulation ensures that AI systems are developed and deployed in an ethical manner, holding organizations accountable for their actions. This promotes responsible AI practices and prevents the misuse of AI technologies.

Fairness and non-discrimination: Regulating AI can help address bias and discrimination by enforcing fairness principles. It ensures that AI systems do not disproportionately impact certain groups and promotes equal opportunities for all individuals.

Consumer protection: Regulating AI protects consumers from fraudulent or deceptive practices. It ensures transparency and fairness in AI-driven products and services, enabling consumers to make informed decisions and seek redress in case of harm.

International collaboration: Regulations facilitate international cooperation and harmonization of AI standards. This promotes consistency in ethical practices, fosters global collaboration, and addresses challenges associated with cross-border AI applications.

Trust and public confidence: Regulations help build trust and public confidence in AI technologies by ensuring responsible and accountable use. This can lead to wider adoption of AI solutions and increased societal acceptance.

> **Read more: How should humans respond to advancing artificial intelligence?**

What are the challenges in regulating AI?

Rapid technological advancement: AI is evolving at a rapid pace, making it challenging for regulators to keep up with the latest developments and effectively regulate a technology that is constantly evolving.

Complexity and development: Regulating AI is challenging due to its complexity and the speed at which it develops. Creating effective regulations that address the intricacies of AI systems and keep pace with technological advancements can be difficult.

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Increased costs and competition: Compliance with regulations may impose additional costs on businesses, particularly smaller companies and startups, limiting their ability to compete in the AI market. The burden of regulatory compliance could disproportionately affect smaller players.

Accountability and liability: Determining responsibility and liability when AI systems cause harm or make erroneous decisions can be challenging. Clarifying the legal frameworks and accountability structures surrounding AI is crucial for effective regulation.

International cooperation: AI regulation requires international cooperation and collaboration to address global challenges, harmonize standards, and prevent regulatory arbitrage. Developing consensus among different countries with varying interests and priorities can be a complex task.

> **Read more: [Bot's The Problem – On the issue of Artificial Intelligence](#)**

How global countries are planning to regulate AI?

Source: Pixelplex

India is planning to regulate AI through several initiatives and frameworks:

Digital India framework: India is developing a comprehensive Digital India framework that will include provisions for regulating AI. The framework aims to protect digital citizens and ensure the safe and trusted use of AI.

An ecosystem of modern cyber laws and regulations: India is constructing an ecosystem of modern cyber laws and regulations driven by the principles of openness, safety, trust, and accountability. These laws and regulations will provide a framework for governing AI technologies.

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National AI programme: India has established a National AI Programme to promote the efficient and responsible use of AI. National Data Governance Framework Policy: India has implemented a National Data Governance Framework Policy to govern the collection, storage, and usage of data, including data used in AI systems. This policy will help ensure the ethical and responsible handling of data in the AI ecosystem.

Draft Digital India Act: The Ministry of Information Technology and Electronics is working on framing the draft Digital India Act, which will replace the existing IT Act. The new act will have a specific chapter dedicated to emerging technologies, particularly AI, and how to regulate them to protect users from harm.

Rest of the World:

European Union: The European Union is working on the draft **Artificial Intelligence Act (AI Act)** to regulate AI from the top down. The Council has published its position, and trialogues with the European Parliament are expected to begin. The goal is to finalize the legislation by the end of 2023.

United States: The White House Office of Science and Technology Policy has published a non-binding Blueprint for the Development, Use, and Deployment of Automated Systems (Blueprint for an AI Bill of Rights), listing principles to minimize potential harm from AI. The National Institute of Standards and Technology (NIST) has released a non-binding AI Risk Management Framework to help companies assess and manage risks associated with AI systems.

Japan: Japan's approach to regulating AI is guided by the Society 5.0 project, aiming to address social problems with innovation. The Integrated Innovation Strategy Promotion Council has published social principles for human-centric AI and guidelines for AI developers and companies. The Governance Guidelines for Implementation of AI Principles provide action goals and implementation examples for AI companies.

China: China has established the "Next Generation Artificial Intelligence Development Plan" and published ethical guidelines for AI. The country has also introduced specific laws related to AI applications, such as the management of algorithmic recommendations.

> **Read more: Regulating AI – Guidelines will need to evolve over time**

What should be done?

Establish comprehensive and flexible regulatory frameworks: The governments should develop clear guidelines and laws that address various aspects of AI, including data privacy, algorithmic transparency, accountability, and potential biases. These frameworks should be adaptable to the rapidly evolving nature of AI technology.

Foster international cooperation: Given the global nature of AI and its potential impact, collaboration among countries is essential. International standards and agreements should be developed to promote ethical practices and ensure consistency in regulation across borders.

Encourage industry self-regulation: Companies involved in AI development should take responsibility for ensuring the ethical and responsible use of their technologies. Self-regulatory initiatives can complement government regulations and demonstrate a commitment to safeguarding public interests.

Promote transparency and explainability: AI algorithms and systems should be transparent, with clear explanations of their functioning and decision-making processes. This will enable

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users and regulators to understand how AI systems operate and detect potential biases or discriminatory outcomes.

Invest in AI research and education: Governments, academic institutions, and industry stakeholders should allocate resources to research, development, and education in the field of AI. This will help create a well-informed workforce capable of addressing regulatory challenges and ensuring the safe and responsible deployment of AI technologies.

Sources: Indian Express (**Article 1** and **Article 2**), **Business Today**, **Live Mint**, **Computer Weekly**, **Forbes**, **Hindustan Times**, **Economic Times**, **One India** and **Harvard Business Review**.

Syllabus: GS 3: Science and Technology – developments and their applications and effects in everyday life.

[Kurukshetra June 2023 Summary] Fostering Water Management for Food Security – Explained, pointwise

Introduction

Water management for food security is a pressing global concern, particularly in areas like India, where agriculture plays a vital role. The agricultural sector is the biggest consumer of water globally, accounting for about 70% of all surface and groundwater withdrawals. India, in particular, uses 80-90% of the total water for agriculture. However, the looming threat of climate change, coupled with a booming population and shifting land-use patterns, has heightened concerns around water scarcity, necessitating urgent conservation measures.

Why Fostering Water Management for Food Security is Necessary?

Water availability and Sources	
Average Annual Rainfall (1985-2015)	105 mm (3880 BCM)
Annual Rainfall (2020)	1283 mm
Mean Annual Natural Run-Off	1999.2 BCM
Total Utilisable Water	1122 BCM
Net Ground Water Availability (2013)	411 BCM
Estimated Utilisable Surface Water Potential	690 BCM
Total Replenishable Ground Water Resources (2013)	432 BCM
Ultimate Irrigation Potential	139.9 Mha (From Surface Water= 76 Mha and 64 Mha from Groundwater)

Source: Kurukshetra

Rising Demand for Food: With the world population expected to reach nearly 10 billion by 2050, there is an increased demand for food. Efficient water management ensures that this growing demand can be met without depleting our water resources.

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Climate Change: Changing climatic patterns have resulted in water scarcity in certain areas and floods in others. Effective water management helps in building resilience against such adverse effects of climate change, thereby ensuring food security.

Depletion of Water Resources: Overexploitation of water resources, particularly for irrigation, has led to their rapid depletion. Fostering efficient water management practices can prevent further depletion and ensure the sustainability of these resources.

Uneven Distribution of Water Resources: Water resources are not evenly distributed across the globe, leading to areas of abundance and areas of scarcity. Efficient water management can help in the optimal utilization of these resources, ensuring food security in all regions.

Socio-economic Considerations: A large section of the global population is dependent on agriculture for their livelihood. Efficient water management not only ensures food security but also economic security for these individuals.

> **Must read: [Kurukshetra April 2023 Summary] Groundwater Water Management through Panchayats – Explained, pointwise**

What initiatives has the Government of India taken to Fostering Water Management for Food Security?

Sector	Water Demand in BCM (Billion Cubic Meter)								
	Standing Sub-Committee of MOWR			NCIWRD					
	2010	2025	2050	2010		2025		2050	
				Low	High	Low	High	Low	High
Irrigation	688	910	1072	543	557	561	611	628	807
Drinking water	56	73	102	42	43	55	62	92	111
Industry	12	23	63	37	37	67	67	81	81
Energy	5	15	130	18	19	31	33	63	70
Other	52	72	80	54	54	70	70	111	111
Total	813	1093	1447	694	710	784	843	973	1180

Source: Kurukshetra

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY): Launched in 2015-16, PMKSY aims to provide irrigation facilities to every farm and improve water efficiency. It amalgamates multiple schemes such as Accelerated Irrigation Benefit Programme (AIBP), Integrated Watershed Management Programme (IWMP), and the On Farm Water Management (OFWM). The scheme has a budget of $93,068 crore for 2021-26 and is expected to benefit around 22 lakh farmers.

Per Drop More Crop (PDMC): A part of the PMKSY, this scheme was launched in 2015-16 with the goal of improving water use efficiency and productivity while reducing input costs. It promotes the use of Micro Irrigation technologies like drip and sprinkler irrigation systems. The

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Government also provides financial assistance or subsidy to small and marginal farmers at 55% of the indicative unit cost and at 45% to other farmers under the PDMC scheme.

Sahi Fasal Campaign: Initiated by the Ministry of Jal Shakti in 2019, this campaign is designed to educate farmers about efficient farming methods and crop selection to maximize water usage.

Bhartiya Prakratik Krishi Paddhati (BPKP): The Government promotes natural farming through this scheme. It aims to reduce cultivation costs, restore soil ecosystems, conserve resources, boost farmer incomes, and ensure environmental sustainability. It is estimated that natural farming requires 50-60% less water and electricity and reduces methane emissions.

> **Must read: Natural Farming – process, advantages and challenges – Explained, pointwise**

What are some measures to mitigate the water footprints of crops?

Promote Efficient Irrigation Systems: Micro-irrigation systems, such as drip and sprinkler irrigation, are being promoted under the 'Per Drop More Crop' initiative. These systems deliver water directly to the plant roots, reducing evaporation and runoff, thus significantly reducing the water footprint.

Crop Diversification: The government is encouraging farmers to grow less water-intensive crops. Crop rotation and multi-cropping are also promoted as they can enhance soil fertility and reduce the water footprint.

Natural Farming Methods: Practices such as the Bhartiya Prakratik Krishi Paddhati (BPKP) promote natural farming, which requires 50-60% less water and electricity compared to conventional farming methods.

Promote Rainwater Harvesting: Rainwater harvesting is being encouraged at both the farm and community level to collect and store rainwater for later use. This can significantly reduce the demand for groundwater and thus the water footprint.

Increase educational programs: The Sahi Fasal campaign educates farmers about water-efficient farming methods and appropriate crop selection based on regional water availability. For instances, nutritious Millets such as Shree Anna Bajra and Shree Anna Jowar are encouraged for cultivation in water scarce regions of the country.

Use of Water-Efficient Goods: The Bureau of Water Use Efficiency (BWUE) has published Indian Standards for micro-irrigation products to promote water efficiency in agriculture.

Monitoring and Regulation: Regular monitoring of Water Use Efficiency (WUE) across all sectors helps to identify areas for improvement and devise effective strategies for reducing the water footprint. This will also help in achieving SDG target 6.4, which focuses on 'substantially increase water- use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity by 2030'.

Community Participation: The government encourages community participation in water conservation. Self-help groups and cooperatives disseminate techniques like rainwater harvesting, groundwater recharge, and the use of micro-irrigation technology to farmers.

> **Must read: Water Management needs a Hydro Social Approach**

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The imperative to foster water management for food security is clear, given the projected population growth, climate change implications, and increasing water stress. With agricultural practices consuming the majority of India's water resources, promoting water-efficient farming techniques and technologies is key. Policymakers and scientists are actively working on bringing about a shift from intensive to resource-efficient, climate-smart farming, but much work remains to be done. Through collective efforts and the successful implementation of water conservation policies, it is possible to ensure food security and sustainable socio-economic growth.

Source: Kurukshetra

Syllabus: GS 1: Human and Economic Geography: Distribution of key natural resources across the world (including South Asia and the Indian sub-continent).

El Nino: Concept and impacts – Explained, pointwise

Introduction
The National Oceanic and Atmospheric Administration (NOAA) recently announced the return of the El Niño phenomenon to the Pacific Ocean. El Niño is a climate pattern that emerges sporadically along the equatorial Pacific and is known for triggering global weather changes. The impacts of El Niño extend far beyond weather, influencing marine ecosystems, agriculture, and human health. As this powerful force returns, understanding the concept of El Niño and its widespread impacts becomes crucial for everyone.
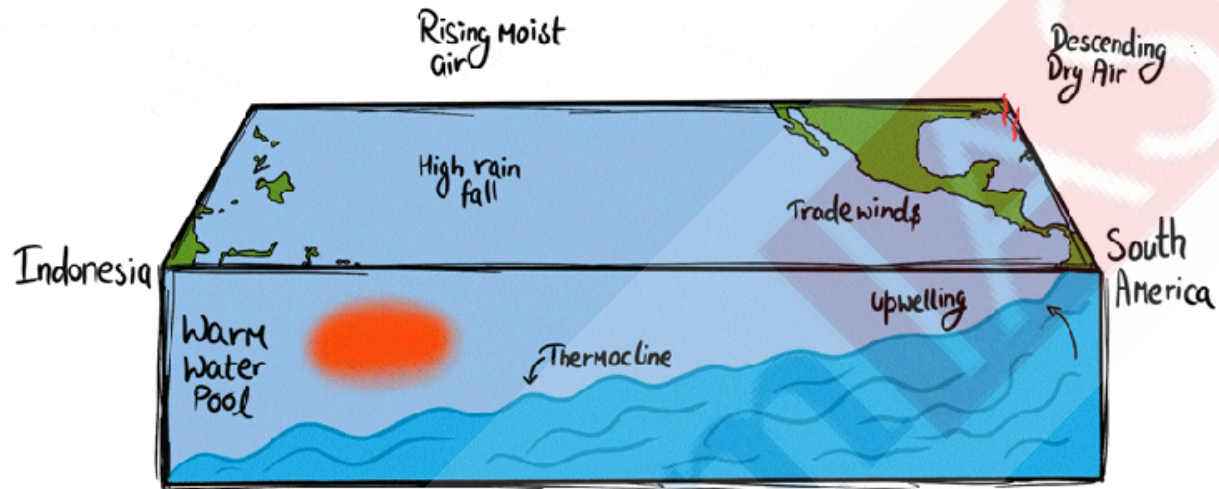
What Is El Nino?
El Niño is a climate pattern that describes the unusual warming of surface waters in the eastern tropical Pacific Ocean. El Niño is the "warm phase" of a larger phenomenon called the El Niño-Southern Oscillation (ENSO). La Niña, the "cool phase" of ENSO, is a pattern that describes the unusual cooling of the region's surface waters. El Niño and La Niña are considered the ocean part of ENSO, while the Southern Oscillation is its atmospheric changes. El Niño events occur irregularly at two- to seven-year intervals.

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How will the formation of El Nino occur?

INDIA
TODAY

Normal Condition

Rising Moist Air

Descending Dry Air

High rain fall

Trade winds

Indonesia

South America

Upwelling

Warm Water Pool

Thermocline

Normally, trade winds blow from east to west, pushing warm water o the west. This warm water causes the air to rise, creating clouds and rain in the west. The dry air then descends on the east side of the ocean, creating a circulation pattern.
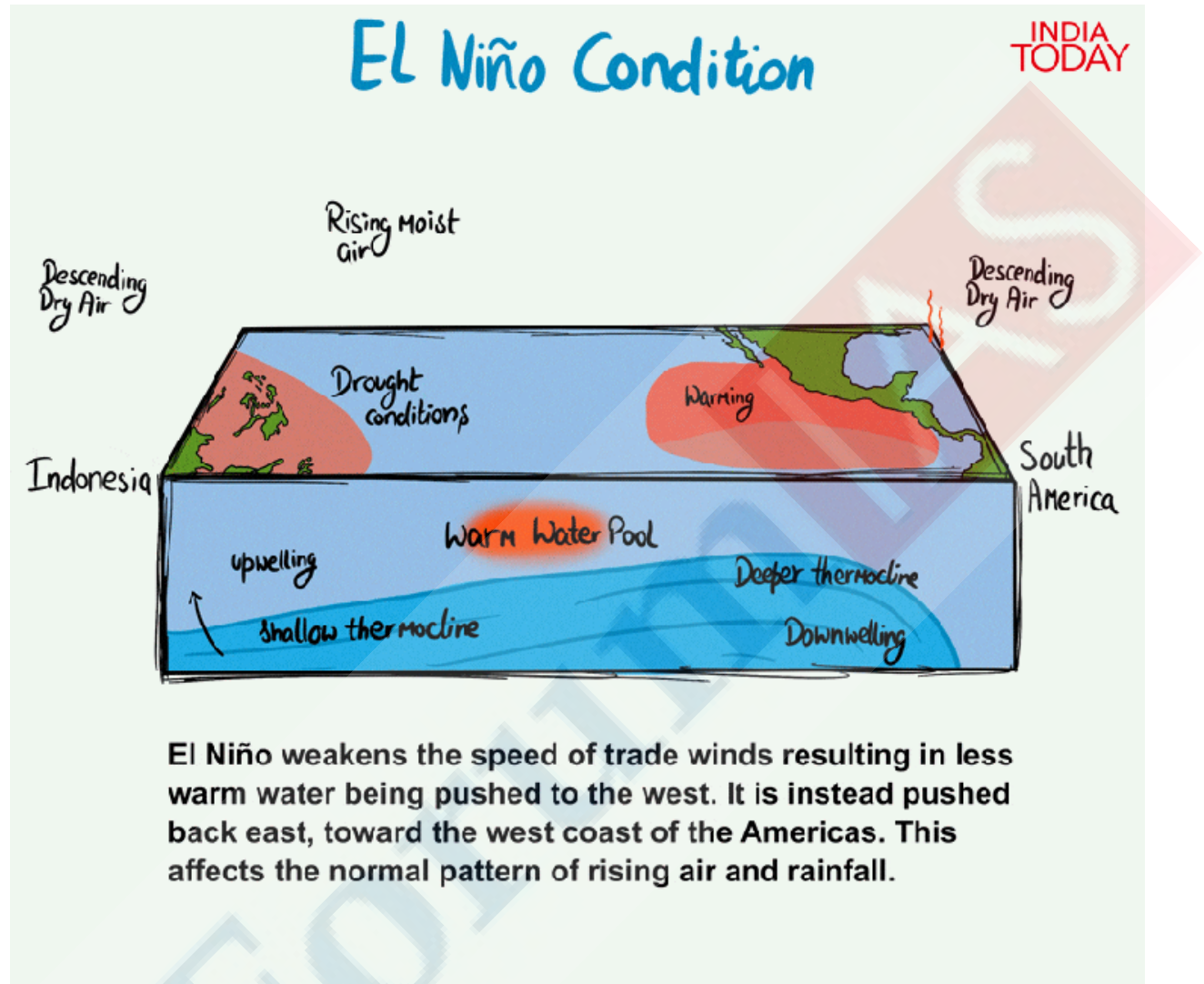
Source: India Today

The formation of El Niño involves a series of interactions between the ocean and the atmosphere in the tropical Pacific. Here are the key steps in this complex process:

Normal conditions: Under normal conditions, the trade winds (which are part of the Earth's general circulation) blow across the tropical Pacific from east to west. These winds push warm surface water towards the western Pacific (near Asia and Australasia), piling it up there. This leaves room for cold, nutrient-rich water to well up from the depths in the eastern Pacific (near South America).

Air circulation: The accumulation of warm water in the west heats the overlying air, making it moist and buoyant. This warm, moist air rises, leading to the formation of rain clouds. The rising air creates a low-pressure system in the west, and a high-pressure system forms in the east where cooler, drier air descends. This pressure difference reinforces the trade winds, completing what is known as the Walker circulation.

Weakening trade winds: The onset of El Niño involves a weakening or reversal of the trade winds. This can happen for various reasons, such as changes in the sea surface temperature

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distribution or atmospheric pressure patterns. The weakening of the trade winds is often initiated by an atmospheric phenomenon known as a westerly wind burst.

El Niño Condition

INDIA TODAY

El Niño weakens the speed of trade winds resulting in less warm water being pushed to the west. It is instead pushed back east, toward the west coast of the Americas. This affects the normal pattern of rising air and rainfall.

Source: India Today

Spread of warm water: When the trade winds weaken, they can no longer push the warm water to the west as effectively. As a result, the warm water spreads from the western Pacific to the east. This process is known as a **Kelvin wave**. The spread of warm water to the east suppresses the upwelling of cold water near South America.

Feedback loop: The eastward spread of warm water further weakens the trade winds, creating a feedback loop that intensifies El Niño. This is because the warmer water warms the overlying air, which lowers the atmospheric pressure and weakens the trade winds.

Establishment of El Niño: As this feedback loop continues, the warm water in the eastern Pacific gets warmer, and the weakened trade winds get weaker. Eventually, a full-blown El Niño event is established, characterized by significantly warmer than average sea surface temperatures in the central and eastern Pacific.

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What are the El Nino impacts in India?

El Nino impact on monsoon patterns and rainfall: El Niño can significantly impact the Indian monsoon, leading to fluctuations in rainfall patterns. During an El Niño year, India often experiences below-average monsoon rains, potentially causing drought conditions.

Droughts and water scarcity: Reduced monsoon rainfall can lead to water scarcity and droughts in many parts of India. These conditions can adversely affect agriculture, causing a decrease in crop yields.

Agriculture and food security: The irregular monsoon patterns during El Niño can impact agricultural yield, leading to potential food shortages and affecting farmers' livelihoods.

Forest fires: During El Niño years, drier conditions may increase the likelihood of forest fires, especially in regions prone to such disasters. Forest fires can cause extensive damage to ecosystems and human settlements, leading to loss of biodiversity and property.

Health impact: El Niño can also lead to public health issues in India. For instance, drier conditions and heat waves can increase the risk of heat-related illnesses. Additionally, changes in weather patterns can also lead to the spread of vector-borne diseases like malaria and dengue.

Economic implications: The altered weather conditions can have significant economic implications. Reductions in agricultural output can increase food prices, while the costs associated with extreme weather events can strain the country's economy.

Climate extremes: El Niño can contribute to other climate extremes in India, such as heatwaves and intense cyclones. These events can cause substantial damage to infrastructure, property, and human lives.
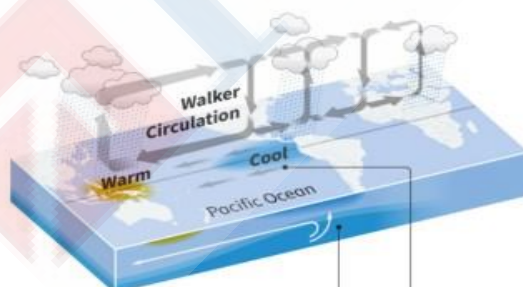
What are the El Nino impacts in regions outside India?

El Nino explained

The El Nino–Southern Oscillation (ENSO) is the Earth's most influential driver of climate variability. El Nino, the warm phase of the ENSO cycle, is marked by warmer-than-average sea surface temperatures across the central and eastern Pacific Ocean.

NEUTRAL CONDITIONS
The Walker Circulation is an east-west vertical atmospheric circulation above the Equatorial Pacific. Moist air rises over normally warm seas, causing abundant rainfall over Asia and Australia

EL NINO CONDITIONS
As trade winds weaken or reverse, warm water and rain clouds from the western Pacific Ocean shift eastward towards the Americas.

Walker Circulation

Cool

Warm

Pacific Ocean

Cooler than normal   Warmer than normal

Upwelling of cold water cools the air, giving South America a cooler and drier climate

Easterly trade winds push warm surface waters westward
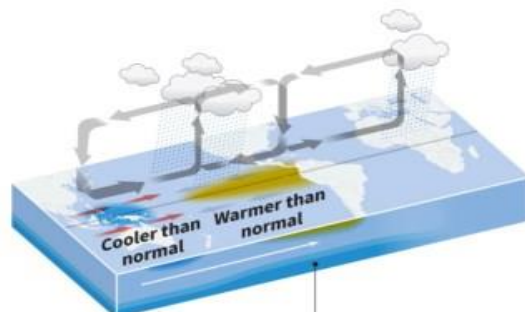
Surface waters in the central and eastern Pacific Ocean become significantly warmer, reducing the upwelling of cold water

Sources: Australia Bureau of Meteorology; NOAA National Weather Service

Source: NOAA

El Niño affects various regions across the globe in different ways. Here are some impacts observed in regions outside India:

North America: El Niño tends to suppress Atlantic hurricane activity, although there are exceptions depending on other climate factors.

South America: Coastal countries in South America like Peru and Ecuador can experience heavy rains and flooding. El Niño weakens the upwelling of cold, nutrient-rich waters along the coasts of South America, which can negatively impact marine ecosystems and fisheries.

Australia and Southeast Asia: These regions generally experience decreased rainfall during El Niño events, which can lead to droughts and significantly impact agriculture, water supply, and ecosystems. This decrease in precipitation can also heighten the risk of wildfires.

Africa: East Africa may receive more rain than usual, which could lead to flooding. Southern Africa may face drier conditions, which can lead to water shortages and impacts on agriculture.

Europe: The impacts on Europe are more uncertain and depend on how El Niño interacts with other climate patterns. However, it can potentially influence the strength and path of the jet stream, which could result in various weather anomalies in the region.

How global nations are planning to mitigate and combat El Nino impacts?

Creation of disaster risk reduction funds: Countries like Peru have created dedicated funds to tackle El Niño. Peru's Disaster Risk Reduction Fund is specifically designated to prepare for and mitigate the potential impacts of El Niño. These funds are often allocated to various activities, including improving infrastructure to withstand extreme weather events, supporting early warning systems, and assisting recovery efforts after disasters.

Improved monitoring and early warning systems: The US-based National Oceanic and Atmospheric Administration (NOAA) continually invests in technology to monitor oceanic and atmospheric conditions better, helping predict an impending El Niño event. Early warnings from organizations like NOAA can help governments worldwide to prepare well in advance and implement strategies to minimize potential impacts.

International cooperation and policy frameworks: Many countries collaborate through international agreements and conventions to manage El Niño's impacts. The Paris Climate Agreement, signed by 196 nations, underscores the importance of global action to address climate change, including phenomena like El Niño. These agreements may involve the sharing of information and resources, the development of common strategies, and cooperation on research and development efforts related to El Niño.

Climate change mitigation efforts: As the effects of climate change can potentially exacerbate the frequency and intensity of El Niño, efforts to mitigate climate change are an integral part of addressing El Niño. The UN's Intergovernmental Panel on Climate Change (IPCC) plays a crucial role in guiding global policies related to climate change, including strategies to cope with El Niño events.

Adapting agriculture and infrastructure: In countries like India, which are heavily impacted by El Niño, there are ongoing efforts to adapt agricultural practices to be more resilient to changes in rainfall and temperature. This includes implementing irrigation facilities, diversifying crop types, and promoting weather-based crop insurance.

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What should be done?

Promoting climate resilient infrastructure: Infrastructure development needs to factor in climate resilience, meaning that buildings, roads, and other infrastructure should be constructed to withstand extreme weather events like those brought on by El Niño.

Strengthening international collaboration: Countries should strengthen international cooperation to share knowledge, technology, and resources to mitigate the impacts of El Niño. Climate change has no borders, and global collaboration is crucial.

Climate change mitigation: Efforts should be heightened to reduce greenhouse gas emissions, as global warming can exacerbate the effects of El Niño. This includes promoting clean energy, reducing deforestation, and implementing sustainable practices in industries.

Adapting agricultural practices: In agriculture-based economies, there should be widespread education on the effects of El Niño on weather patterns to help farmers adapt their practices. This can include crop diversification, implementing irrigation facilities, and promoting weather-based crop insurance.

Building disaster management capacity: Countries should work on building their capacity to manage and respond to disasters caused by El Niño. This includes establishing effective disaster response strategies, conducting regular drills, and ensuring adequate resources are allocated to disaster management.

Conserving marine ecosystems: Since El Niño severely impacts marine ecosystems, it is crucial to conserve and protect these ecosystems as much as possible. This includes preventing overfishing, reducing pollution, and protecting marine habitats like coral reefs.

Sources: **Business Standard**, **Bloomberg**, **Time**, **The Weather Channel**, **Climate.gov**, **Live Mint**, **NPR**, **TOI**, **Reuters**, **India Today**, **DTE**, **Financial Express** and **BBC**

Syllabus: GS 1: Geophysical Phenomena: Important Geophysical phenomena

Data Security in India: Need and Challenges – Explained, pointwise

Introduction

India, set to become a trillion-dollar digital economy by 2026, faces significant data security needs and challenges. With over a billion people, digitization and burgeoning internet usage, India must protect its citizens' data from vulnerabilities and breaches. However, despite a digitally-forward government and robust IT sector, the country lacks critical infrastructure, comprehensive data protection laws, and effective cybersecurity regulations. Consequently, India grapples with increased cyber threats, placing a spotlight on the urgent need for robust data security measures and the challenges in implementing them.

What is the recent allegation of a data security breach of CoWIN data?

Data security breach: There have been recent allegations surrounding a data security breach of CoWIN, the centralized digital platform used in India for COVID-19 vaccination registration. The claims suggest that unauthorized access to the personal data of millions of CoWIN registered users occurred, with this data then being reportedly displayed via a Telegram bot.

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Sensitive information leaked: The leaked data is said to include sensitive information such as names, contact details, Aadhaar numbers, and the vaccination status of users. The situation has raised serious concerns about privacy and data protection in India, and highlights the need for robust cybersecurity measures.

Indian government response: The Indian government, and specifically the Ministry of Health and Family Welfare, have denied any data breach. They insist that their security measures for CoWIN are stringent and that no data has been compromised. Despite their assurances, this incident underscores the urgent need for more comprehensive data protection legislation in India.

> **Read more:** [CoWIN vaccination data out, Centre denies breach](#)

Why does India need to focus on Data Security?
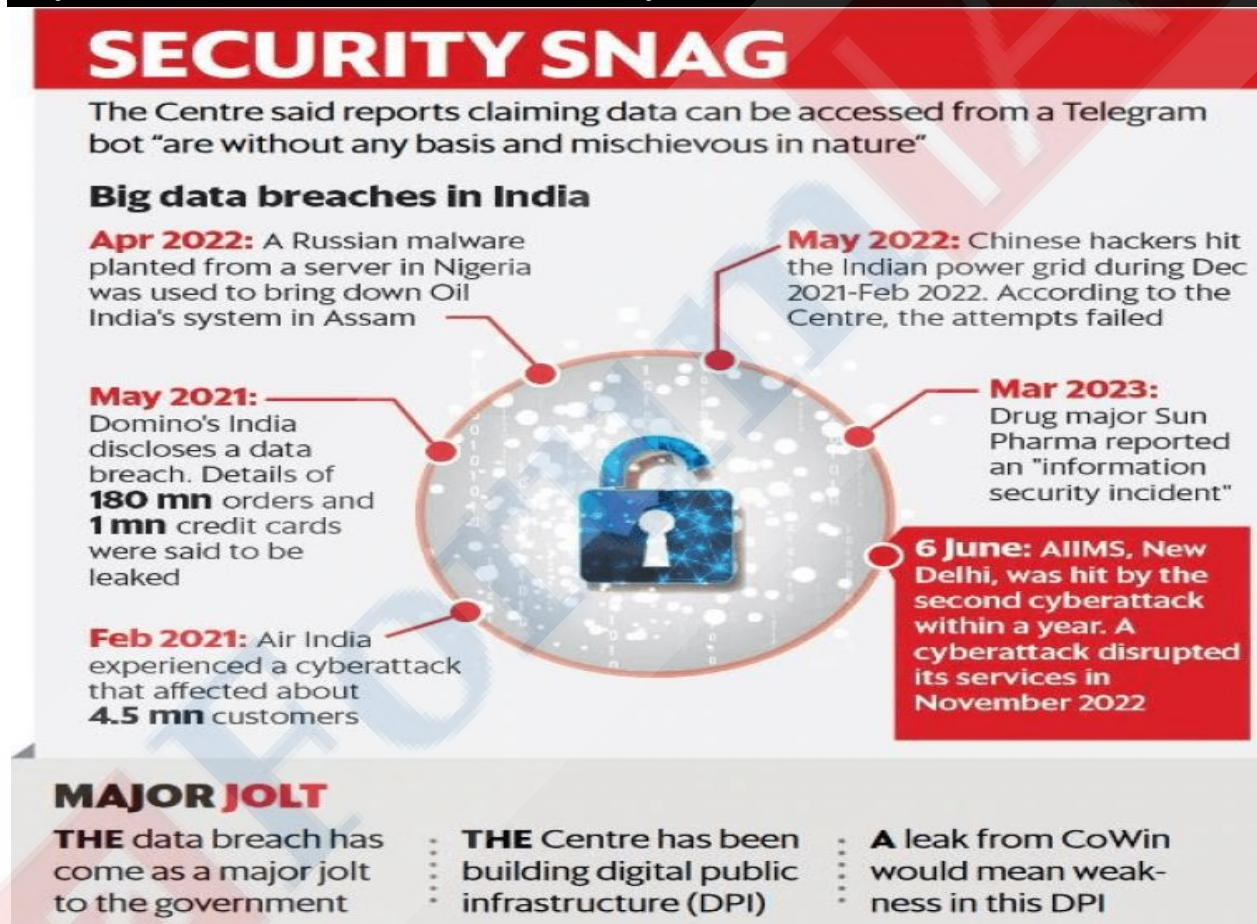
Source: Live Mint

Rapid digitization: India's rapid digital transformation, especially in government services and the financial sector, necessitates a stronger focus on data security. India's digital public infrastructure, known as India Stack, handles vast amounts of personal data that could be targeted by cybercriminals.

Large-scale data breaches: Over 80 million Indian users were reportedly affected by data breaches in 2021. These breaches can undermine user trust in digital systems, negatively impact the transition to digital services, and cause significant financial damage.

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Increasing cybersecurity threats: India witnessed over 674,000 cybersecurity incidents in just the first half of 2022, as reported by CERT-In. This signals an escalating trend in cyber threats.

Poor ranking in "Global Cybersecurity Index": India's low ranking (17 out of 20) in the MIT Technology Review CyberDefense Index 2022/23 is indicative of its inadequate cybersecurity preparedness. The report cited a lack of critical infrastructure and weak cybersecurity regulation as key areas of concern.

Data protection legislation gap: Despite the Supreme Court's ruling in 2017 that privacy is a fundamental right, comprehensive data protection legislation is still missing in India. This leaves the digital rights and privacy of users exposed.

Global tech presence: Most Indian citizens use foreign-owned social networking sites and mobile devices dominated by foreign manufacturers. This, coupled with the push towards data localization, adds layers of complexity to India's data security landscape.

National security concerns: Governments need access to personal data for national security reasons, but without appropriate data security, this can lead to misuse or compromise of sensitive information.

How is Data Security ensured in India?

Source: DSCI

Digital public infrastructure: India has established a digital public infrastructure (DPI), known as India Stack. This DPI ensures secure and privacy-respecting digital access to public and private services.

Computer Emergency Response Team (CERT-In): It is the national nodal agency that deals with cybersecurity threats in India. It responds to cybersecurity incidents and strengthens India's response to cybersecurity threats.

Regulatory measures: Even though comprehensive data protection legislation is still pending, India relies on regulations within the Information Technology (IT) Act of 2000 and sector-specific regulations for data privacy and protection.

National cybersecurity policy: India has a national cybersecurity policy that provides a framework for securing cyberspace in the country. It aims to create a cyber-secure environment that allows the robust growth of the IT and digital sectors.

Public-private partnerships: India works with private sector companies to enhance cybersecurity capabilities. The government has established institutions to ensure the continuity of India Stack's operations, acting as a catalyst in developing India's cybersecurity ecosystem.

Data localisation: Some drafts of data protection bills have proposed stringent data localisation provisions, requiring data fiduciaries to store a copy of personal data collected in India. This could help enhance control over data and its security.

> **Read more: Data Protection Framework in India – Explained, pointwise**

How global nations are ensuring Data Security?

Data protection regulations: Many nations have established comprehensive data protection laws. For example, the European Union implemented the General Data Protection Regulation (GDPR), which offers stringent guidelines for the collection, storage, and use of personal data. In the United States, individual states like California have rolled out their own privacy laws such as the California Consumer Privacy Act (CCPA).

National cybersecurity strategies: Countries like the United States, the United Kingdom, Australia, and Canada have outlined national cybersecurity strategies. These documents detail government approaches to managing cyber threats, protecting critical infrastructure, and ensuring the security of digital services.

Establishing cybersecurity agencies: Specific agencies handle cybersecurity in various countries. For example, the United States has the Cybersecurity and Infrastructure Security Agency (CISA), while the United Kingdom operates the National Cyber Security Centre (NCSC).

International cooperation: The European Union, through its cybersecurity agency ENISA, promotes cooperation between member states in the cybersecurity field. Similarly, the "Five Eyes" alliance – comprising the United States, United Kingdom, Canada, Australia, and New Zealand – regularly share intelligence, including cybersecurity threats.

Incident response teams: Many nations, including India with its Computer Emergency Response Team (CERT-In), and South Korea with its Korea Internet Security Agency (KISA), have teams dedicated to handling cybersecurity incidents.

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Regulation of cybersecurity products and services: Governments are also putting stricter regulations on the cybersecurity products and services used in their countries. This includes setting minimum security standards and certifying products for their security.

What are the challenges in ensuring Data Security in India?

Infrastructure and regulation deficiency: The MIT Technology Review CyberDefense Index indicates India has a significant deficit in critical infrastructure, weak cybersecurity regulation, and limited national digital economy adoption, despite having a digital-forward government and one of the world's largest IT-enabled service sectors.

Lack of national cybersecurity law and dedicated ministry: Despite the rising number of cyberattacks and the urgent calls for stronger cybersecurity measures, India currently lacks a comprehensive national cybersecurity law and a ministry dedicated to cybersecurity.

Inadequate data protection law: India's Personal Data Protection Bill of 2019 was withdrawn due to severe criticism over its potential to infringe upon personal data privacy. The country's data protection remains under the IT Act of 2000, which only provides for punishment in cases of negligent data handling. This approach is insufficient for the modern digital era, with its complexities and new types of threats.

Resource constraints and firefighting: Often, resources dedicated to cybersecurity are insufficient, leading to a constant firefighting mode, leaving little time for learning, strategizing, or improving defenses.

Reliance on foreign infrastructure: Most Indian internet users rely on foreign-owned social networking sites and hardware, creating unique national security challenges. This reliance could expose the country to additional cyber threats and data breaches.

> **Read more:** [**Draft Digital Personal Data Protection Bill, 2022: Benefits and Concerns – Explained, pointwise**](#)

What should be done to ensure Data Security in India?

Establish strong legal frameworks: As in the European Union's GDPR model, India needs comprehensive legal frameworks to protect personal data and prevent breaches.

Cybersecurity Ministry and laws: Like Australia, India could establish a dedicated Cybersecurity Ministry to oversee and respond to cybersecurity threats. Similarly, robust national cybersecurity laws would strengthen India's ability to respond to cyber threats.

Invest in infrastructure: There's a need to build robust digital infrastructure similar to the Netherlands, which is a nerve center for pan-European cybersecurity.

Upskill and cross-skill: To meet evolving threats, India needs to invest in skills development in emerging tech cybersecurity domains. Experts could be trained in adaptive security, cloud security posture management (CSPM), Zero Trust Architecture (ZTA), and quantum cryptography, among other areas.

Public-private partnerships: In line with global best practices, fostering partnerships between government, industry, and academia can help to develop innovative solutions to cybersecurity challenges.

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Adopt zero trust models: As recommended by global cybersecurity experts, adopting a Zero Trust Architecture (ZTA) approach, which assumes that no users or devices are trustworthy by default, regardless of their location or network, can help bolster security.

Awareness and training: There should be continuous efforts to increase awareness and training among internet users about data privacy and the steps they can take to protect their own data.

Regular cybersecurity audits: Like many developed nations, India should implement regular and rigorous cybersecurity audits for both public and private entities to ensure that they're adhering to the best practices in data security.

Sources: Indian Express (**Article 1**, **Article 2** and **Article 3**), Times of India (**Article 1**, **Article 2** and **Article 3**), **Business Standard**, **Livemint**, **The Hindu**, **East Asia Forum**, **Economic Times** and **Business Today**)

Syllabus: GS 3: Security Issues: basics of cyber security.

Transgenic Crops in India: Need and Challenges – Explained, pointwise

Introduction

Transgenic crops are subject of significant debate in India. Despite their potential to combat agricultural challenges, they raise concerns regarding their impact on the environment and human health.

Recently, three Indian states – Gujarat, Maharashtra, and Telangana – have delayed testing a new transgenic cotton seed, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC). This situation highlights the ongoing challenges and complexities surrounding the acceptance and implementation of transgenic crops in India.
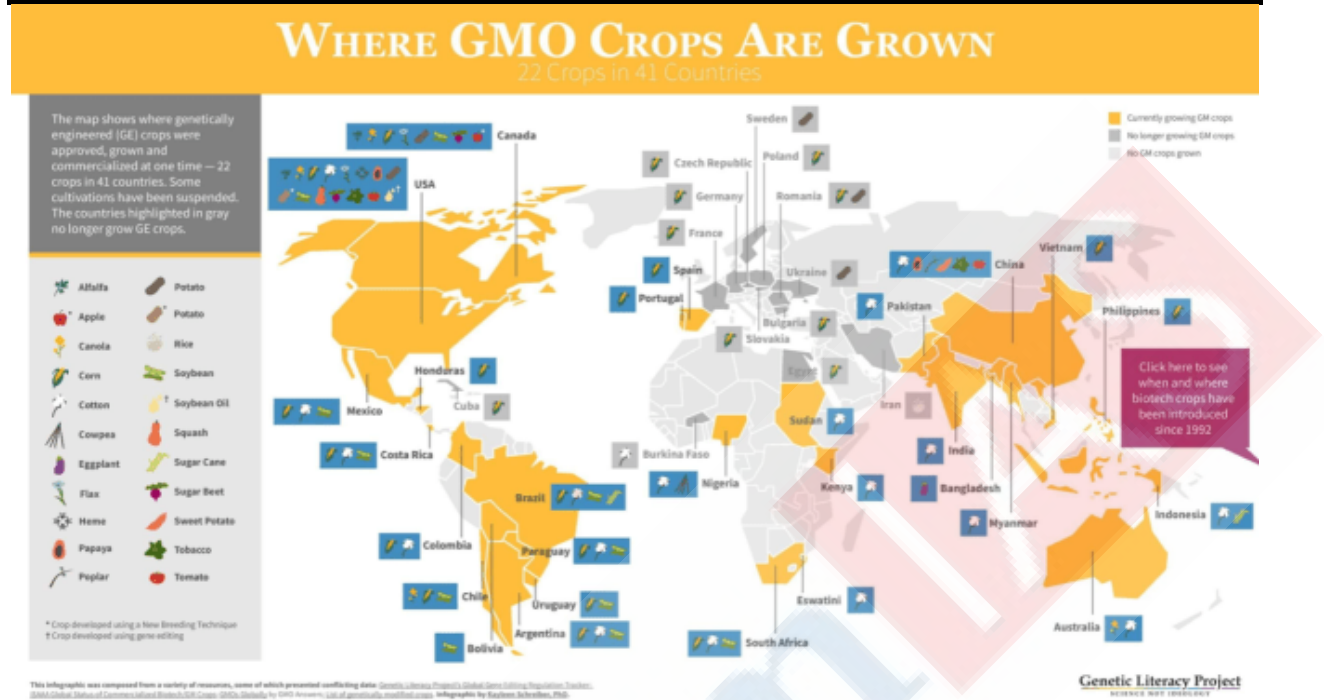
What are transgenic crops?

Transgenic crops, also known as genetically modified organisms (GMOs), are plants that have had their DNA altered using genetic engineering techniques. This process involves inserting one or more genes from a different species into the plant's genome to confer certain advantageous traits that aren't naturally present in the species.

An example of a transgenic crop is Bt cotton, which is widely grown in several countries, including India.

Transgenic crops like these are developed to improve crop yield, enhance nutritional value, reduce the use of chemical pesticides, and increase resistance to environmental stressors like drought or frost. However, the use of GMOs also raises concerns related to potential health risks, environmental impact, and ethical considerations.

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About the transgenic crops permitted in India and in other countries

Source: Genetic literacy project

Transgenic crops in India

Bt cotton: In India, the major transgenic crop that has been commercialized is Bt cotton. Bt cotton is genetically modified cotton that expresses a toxin derived from the bacterium Bacillus thuringiensis, which provides resistance against destructive pests such as the bollworm.

GM mustard: In addition, India is also considering the commercial release of genetically modified mustard known as Dhara Mustard Hybrid (DMH -11). This GM mustard has genes from a soil bacterium that enhance hybridization, potentially leading to a yield increase of 25-30%. As of now, this crop has received approval from the GEAC but is yet to receive final clearance from the Ministry of Environment.

Other transgenic crops which are under developmental phases in India

GE banana: The National Agri-Food Biotechnology Institute (NABI) in Mohali is developing fungus-resistant varieties and exploring the fortification of bananas with iron. They are also working on increasing the amount of provitamin A in the fruit.

GE potato: The Central Potato Research Institute (CPRI) in Shimla has received permission to conduct research on the GE potato hybrid KJ66, derived from the wild Mexican potato, aimed at combating the late blight pathogen Phytophthora infestans.

GE maize: Rallis India Limited has received conditional approval from GEAC to conduct trials on GE maize, aimed at improving its resistance to the moth Spodoptera frugiperda and tolerance to the herbicide glyphosate.

GE rubber: The Rubber Research Institute in Kottayam has been granted permission for trials of two GE rubber lines expressing an 'osmotin' gene, which is expected to confer resilience to the plants under a range of adverse conditions.

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Transgenic crops in other countries

Soybeans: In the United States, one of the first and most widespread transgenic crops is the Roundup Ready soybean. These soybeans are engineered to be resistant to glyphosate, the active ingredient in the herbicide Roundup.

Bt maize: Another common transgenic crop is Bt maize (or corn), which like Bt cotton, contains a gene from the Bacillus thuringiensis bacterium. This allows the maize to produce a protein that is toxic to certain types of pests, notably the European corn borer.

Golden rice: In some parts of Asia, a genetically modified version of rice known as Golden Rice has been developed. This rice is modified to produce beta-carotene, a precursor of vitamin A, in the edible parts of the rice plant. This is intended to combat vitamin A deficiency, a significant public health problem in many developing countries.

Must read: **GM Crops in India: Issues and challenges – Explained, pointwise**

How India is regulating transgenic crops?

Mandate of Ministries/Departments

Ministry of Environment, Forest and Climate Change	• Primarily responsible for conservation and protection of environment, ensuring environmental and human health safety before release of GMOs / LMOs. • Nodal agency for implementing Rules, 1989 and the Cartagena Protocol on Biosafety
Department of Biotechnology (Ministry of Science & Technology)	• Nodal department for promoting biotechnology programs • Provides scientific support in implementation of biosafety regulations • Provide services in areas of research, infrastructure, generation of human resource
Ministry of Agriculture	• Policies aimed at agriculture growth. • Indian Council of Agricultural Research (ICAR) responsible for monitoring agronomic benefits of GM technology. • Monitoring post-release performance of GM crops.
Ministry of Health and Family Welfare	• Policies aimed at protecting and monitoring human health. • Food Safety and Standards Authority of India responsible for regulating genetically engineered foods.
Ministry of Commerce and Industries	• Enhance trade with other countries through export/import policies. • Nodal agency for implementing DGFT notification on GMOs
Central Board of Excise and Customs, Department of Revenue, Ministry of Finance	• Enforcement of regulation pertaining to transboundary movement of GMOs/LMOs at point of entry

Source: The Hindu

India has a well-established regulatory framework in place to control and supervise the introduction and cultivation of GM crops. This is governed by various rules, regulations, and guidelines set by different ministries and departments.

The Genetic Engineering Appraisal Committee (GEAC): The committee reviews proposals related to the release of GM organisms and products into the environment, including experimental field trials.

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Environment Protection Act: The GEAC or people authorised by it have the power to take punitive actions under the Environment Protection Act.

Role of the [Indian Council of Agriculture Research (ICAR)](#): The ICAR plays a crucial role in supervising the development of new GM varieties and hybrids. For example, the recent approval for GM mustard allows for the environmental release of two genetically engineered mustard varieties under the supervision of the ICAR.

Assessment of Risks: The regulatory framework also requires the evaluation of potential risks to human health, animal health, and biodiversity. This involves rigorous testing under laboratory and field conditions to ensure the safety and efficacy of GM crops.

Public Consultation: In some cases, public consultation is also part of the process before a final decision is made about the commercialization of a GM crop. This allows stakeholders, including the public, to voice their concerns and opinions.

> **Read more: [Genetic Engineering Appraisal Committee approves commercial cultivation of genetically modified mustard yet again](#)**

What are the arguments supporting the introduction of transgenic crops in India?

Addressing food security: One of the main arguments supporting the introduction of transgenic crops in India is the potential to enhance food security. With India's population continually growing, transgenic crops offer a promising solution to increase agricultural yield and meet the escalating food demand.

Improved crop characteristics: Transgenic crops can be engineered to have desired traits such as drought resistance, pest resistance, and improved nutritional content. These modifications can lead to healthier, more resilient crops that are better suited to varying climatic conditions and can contribute to higher yields.

Economic benefits for farmers: Transgenic crops can provide economic advantages to farmers. The use of crops genetically engineered to resist pests, for instance, can reduce the need for expensive pesticides. The GEAC's recent approval of GM mustard is a prime example of this, with the potential to boost yield and subsequently increase farmers' income.

Potential environmental benefits: By reducing the need for chemical pesticides and herbicides, transgenic crops may also help decrease environmental pollution. Furthermore, certain GM crops may require less water, contributing to more sustainable water use.

Enhanced crop diversity: Transgenic technology can facilitate the development of new crop varieties, enhancing agricultural biodiversity. This could offer farmers a greater choice of crops to cultivate, potentially leading to more diverse farming systems.

What are the arguments against the introduction of transgenic crops in India?

Health concerns: Some groups argue that the consumption of genetically modified crops could potentially lead to health issues. There are concerns about allergenicity, antibiotic resistance, and the overall safety of consuming foods derived from GMOs.

Impact on biodiversity: Critics also argue that the introduction of transgenic crops could negatively impact biodiversity. There are concerns that the proliferation of GM crops could lead to the genetic contamination of wild relatives of the modified crops. The increased use of herbicide-resistant crops could harm non-target organisms and beneficial insects.

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Potential socio-economic implications: There are also socioeconomic considerations. For instance, small farmers might face difficulties if they cannot afford the often higher-priced GM seeds, potentially exacerbating economic inequalities in rural communities.

Dependence on multinational companies: Many GM seeds are patented by multinational corporations. Farmers using these seeds would be dependent on these companies for their supply, potentially leading to monopolistic practices and loss of control over their own agricultural practices.

Ethical and cultural concerns: For some, the genetic modification of crops raises ethical questions about human intervention in nature. These can be especially potent in countries like India with rich cultural and religious traditions tied to natural processes.

What should be done?

Enhanced research and development: To address concerns related to transgenic crops, further research and development should be undertaken. This should focus on comprehensive risk assessment, long-term impact studies, and the development of techniques to prevent cross-contamination.

Rigorous regulatory framework: The regulatory framework for the approval and monitoring of transgenic crops in India needs to be rigorous. This can help ensure that only those GM crops that are safe for human health and the environment are permitted.

Capacity building in biotechnology: India needs to enhance its capacity in the field of biotechnology. This involves training scientists in advanced techniques, and creating world-class laboratories that can undertake cutting-edge research in this field.

Public awareness and engagement: Transparent, evidence-based information on GM crops should be shared with the public to address concerns and misconceptions. This could involve engaging with communities through public consultations before the introduction of GM crops.

Protecting farmers' interests: Policies should be in place to protect farmers from potential exploitation by multinational companies selling GM seeds. This includes ensuring farmers have access to a variety of seeds, including non-GM options.

Monitoring environmental impact: After the introduction, transgenic crops should be continuously monitored to assess their impact on biodiversity and ecosystems. In particular, the potential for gene flow to non-target species should be rigorously evaluated.

International collaboration: India can benefit from international collaboration in this field, learning from the experiences of other countries that have successfully adopted transgenic crops, and working together to address shared challenges.

Sources: Indian Express (**Article 1**, **Article 2** and **Article 3**), The Hindu (**Article 1**, **Article 2** and **Article 3**), **Counter view**, **The Print**, **India Today**, **Weather**, **DTE** and **The Hindu Businessline**

Syllabus: GS 3: Science and Technology: Awareness in the field of biotechnology.

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