
Prelims Exam Topics

IMI-RESISTANT MUSTARD HYBRIDS

Context

Indian farmers are set to begin wide-scale cultivation of IMI-resistant mustard hybrids in the 2026-27 rabi season to combat the parasitic weed Orobanche.

About IMI-Resistant Hybrids

- Developed through **mutation breeding** (not GM crops), preserving natural mutations rather than introducing foreign genes.
- Based on the enzyme **Acetolactate Synthase (ALS)**, essential for plant growth.
- Normal mustard is killed by Imidazolinone (IMI) herbicides as they inhibit ALS; in these hybrids, a single DNA change makes ALS resistant to the herbicide.
- Farmers can spray IMI herbicides directly over the field, killing only weeds including Orobanche through the soil where manual weeding cannot reach.

1. **Mutation Breeding:** Inducing mutations in a crop's DNA using physical or chemical agents to develop desirable traits, without inserting foreign genes; not regulated as genetic modification.
2. **Orobanche (Phelipanche):** An obligate root holoparasite with no chlorophyll; entirely dependent on host plants for water and nutrients; attached underground making manual removal ineffective.

EXTERNAL AFFAIRS MINISTER OF NEPAL VISIT TO INDIA

Context

Nepal's External Affairs Minister visited India, during which several key bilateral initiatives were launched

Key Outcomes

- **UPI-NPI Linkage:** India's Unified Payments Interface (UPI) linked with Nepal's National Payments Interface (NPI) to facilitate cross-border remittances.
- **Earthquake Reconstruction Assistance:** India handed over 72 health facilities and 12 cultural heritage sector projects to Nepal.
- **MoU — Digital India Bhashini & Kathmandu University:** For co-creating a National Digital Infrastructure for a "Voice First" Language Translation platform.

- **India-Nepal Mutual Legal Assistance Agreement (MLAA):** Implementation welcomed in Criminal Matters for enhanced legal cooperation.



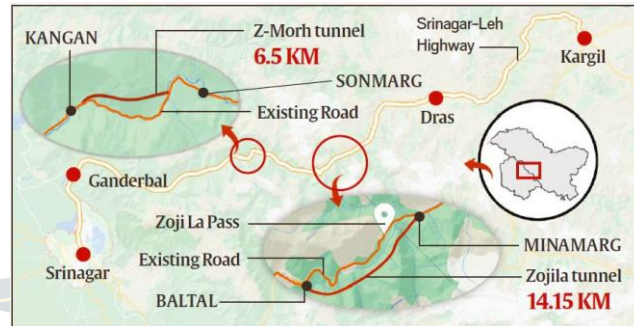
Places in News

ZOJILA TUNNEL

News: The Zojila Tunnel achieved its final breakthrough with the last blasting from the Kargil side.

About Zojila Tunnel

- World's longest single-tube bi-directional road tunnel above 11,500 feet.
- Connects Ganderbal district (Kashmir) with Drass district (Ladakh/Kargil).
- Located in Seismic Zone IV - high seismic sensitivity.
- **Significance:**
 - Enables year-round all-weather connectivity between Kashmir Valley and Ladakh- first time ever.
 - Strengthens strategic and military logistics along the Line of Actual Control (LAC).
- **Zoji La Pass (Ladakh, Great Himalayas):** High mountain pass on NH-1 (Srinagar–Leh Highway) at ~3,528 m



PHILIPPINES

News: At least 35 people have died after a magnitude-7.8 earthquake struck off the coast of Mindanao island in the southern Philippines

About Philippines

- **Location:** Southeast Asia, an archipelago of over **7,600 islands** between the **Philippine Sea (Pacific Ocean)** and the **South China Sea**.
- **Capital:** Manila (with Quezon City as the most populous city).
- **Geography:** Mountainous, volcanic islands with a tropical maritime climate.
- **Other key facts:** Part of the **Coral Triangle**, rich in biodiversity; member of ASEAN.



Mindanao Island

- **Location:** Southernmost major island of the **Philippines**,
- Bordered by: **Sulu Sea**, **Celebes Sea**, and **Philippine Sea**.
- **Size:** **Second-largest** island of the Philippines (after Luzon).
- **Strategic Waters:** Near key maritime routes connecting the **South China Sea** and **Pacific Ocean**.

RED SEA

News: Iran-aligned Houthi rebels in Yemen announced a missile attack on Israel and declared a ban on Israeli shipping in the Red Sea.

About Red Sea

- **Location:** A seawater inlet of the **Indian Ocean**, lying between Africa (to the west) and Asia (to the east).
- It is one of the **saltiest and warmest** bodies of seawater in the world, formed by the Red Sea Rift (part of the Great Rift Valley).
- **Bordering Countries:** **East:** Saudi Arabia and Yemen, **West:** Egypt, Sudan, Eritrea, and Djibouti, **North:** Israel and Jordan have narrow coastal access via the **Gulf of Aqaba**.
- **Connections & Strategic Chokepoints**
 - **North:** Connects to the Mediterranean Sea via the Suez Canal (artificial) and the Gulf of Suez.
 - **South:** Connects to the Gulf of Aden and the Indian Ocean through the Bab el-Mandeb Strait (a critical global chokepoint).
 - **Gulfs:** At its northern end, it splits into the Gulf of Suez (west) and the Gulf of Aqaba (east), separated by the Sinai Peninsula.
- **Major Rivers:** The Red Sea has no permanent, year-round rivers draining into it. It relies on seasonal wadis (like the Baraka River) and water exchange with the Indian Ocean.
- **Major Ports:**
 - **Jeddah Islamic Port (Saudi Arabia):** The busiest and largest port on the Red Sea.
 - **Suez & Port Said (Egypt):** Key transit hubs for the Suez Canal.



- **Port Sudan (Sudan):** The primary maritime gateway for Sudan.
- **Aqaba (Jordan) & Eilat (Israel):** Strategic northern outposts on the Gulf of Aqaba.



Mains Exam Topics

SCALING INDIA'S SOLAR POWER SCHEMES

Context

India has rapidly scaled solar capacity, adding over 50 GW in 2025 alone, more than any country except China, with solar now accounting for ~30% of total installed electricity capacity.

What Is the Current Status of India's Flagship Solar Schemes?

- **PM Suryaghar Yojana:** Against a target of 1 crore household installations, only 40.52 lakh households have been connected so far.
 - Gujarat, Maharashtra, Kerala, and Rajasthan account for nearly 70% of the 31 lakh rooftop installations, while Bihar, Jharkhand, West Bengal, and Tamil Nadu report critically low adoption rates.
- **PM-KUSUM:** Against 14 lakh pump installations targeted, only 10.9 lakh had been installed by March 2025.

What Are the Key Challenges Hindering Adoption?

- **Perverse Subsidy Structure:** Free or heavily subsidised electricity in states like Punjab (which spent over ₹8,000 crore on power subsidies) eliminates the financial incentive to invest in upfront solar installation.
- **High Upfront Capital Cost:** Solar equipment costs several lakh rupees, recoverable only over time through bill savings and surplus power sales-disproportionately affects low-income households without access to affordable credit.
- **Low State Capacity and Implementation Gaps:** Poor-performing states reveal systemic weaknesses in distribution company (DISCOM) readiness, grid integration capacity, and ground-level awareness programmes.
- **Demand-Supply Mismatch at Peak Hours:** April-May 2026 peak demands were met largely through solar output, revealing dangerous grid over-dependence on a single intermittent source with no storage backup.

What Is the Way Forward?

- **Rationalise Competing Subsidies:** States offering free electricity must be incentivised through GST-linked fiscal transfers to phase out subsidies that structurally undermine solar adoption.

- **Expand Affordable Financing:** Low-cost credit products, collateral-free green loans, and BNPL (buy-now-pay-later) models for rooftop equipment can decouple upfront cost barriers from long-term savings incentives.
- **Strengthen DISCOM Readiness:** Grid upgradation, net-metering infrastructure, and real-time procurement capacity must be built in low-adoption states before demand-side interventions alone can succeed.
- **Mandate Performance-Linked State Targets:** Scheme funds should be disbursed on a performance-linked basis, with low-adoption states required to submit grid-readiness and awareness plans before receiving the next tranche.
- **Integrate Storage to Manage Peak Demand:** Pairing rooftop solar with affordable battery storage, supported through KUSUM-linked incentives, can smooth the demand-supply mismatch during peak periods.

PRE FACT BOX**PM Suryaghar Yojana**

- Target: Install rooftop solar on **1 crore households**
- Provides households with up to 300 units of free electricity every month by subsidizing the installation of grid-connected rooftop solar systems
- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE)

PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan)

- Three components:
 - **Component A:** 10 GW decentralised ground-mounted solar plants
 - **Component B:** 20 lakh standalone solar pumps
 - **Component C:** Solarisation of 15 lakh grid-connected pumps
- Allows farmers to sell surplus power to DISCOMs, converting them from energy consumers to energy producers
- **Nodal Ministry:** Ministry of New and Renewable Energy (MNRE)

INDIA'S FTA STRATEGY

Context

India now has 15 FTAs covering 27 countries, with 9 more under negotiation. Once finalised, India's FTA partners will total 69 countries, accounting for nearly 75% of India's exports.

What Are the Potential Benefits of FTAs for India?

- **Market Access and Export Competitiveness:** At 50% tariff reduction, exporters from partner countries gain significant price advantage in the Indian market, reciprocally, Indian exporters gain preferential access to large consumption markets.
- **Expanding Export Footprint:** In FY2025, India exported \$48.6 billion to UAE, Australia, Mauritius and EFTA countries under FTA frameworks, with South Asia's trade surplus expanding from \$6.7 billion to \$20 billion during the same period.
- **Import-Side Savings:** Relatively high import-side utilisation rates of 60-70% mean rising imports under FTAs generate substantial input cost savings for Indian manufacturers dependent on raw materials.

What Are the Key Challenges Undermining FTA Utilisation?

- **Rising Trade Deficits:** India's trade deficit with ASEAN grew 381% between 2007-09 and 2022-25, with the average annual trade deficit across FTA partners reaching \$62 billion, signalling imports have structurally outpaced export gains.
- **Low Utilisation of FTA Benefits:** Only 6% of India's imports enter duty-free under MFN treatment against 80%+ in Japan and Malaysia.
- An estimated 20-30% of eligible Indian exports never claim FTA preferences due to compliance burdens around rules of origin and certification.
- **Inverted Duty Structures:** Input tariffs exceed duties on finished goods, making it cheaper to import finished products duty-free under FTAs than to manufacture domestically, directly disadvantaging Indian producers in chemicals, plastics, steel, and textiles.
- **Make in ASEAN, Sell in India Risk:** When manufacturing in ASEAN becomes cheaper than producing in India, FTAs push investment and jobs outward, effectively promoting "Make in ASEAN, Sell in India" over Make in India.

What Is the Way Forward?

- **Fix Inverted Duty Structures:** Reducing import duties on raw materials and intermediates to levels below finished goods will restore the cost advantage of manufacturing in India without touching FTA terms.

- **Reduce Compliance Burden on Exporters:** Simplifying rules of origin certification and building MSME-level awareness can lift FTA utilisation from the current 20-30% to levels seen among ASEAN peers.
- **Negotiate Symmetrical Tariff Schedules:** Future FTAs must account for India's higher MFN tariff baseline, ensuring reciprocal reduction timelines rather than arrangements that systematically favour partner-country exporters.
- **Link FTAs with PLI Sectors:** Aligning Production-Linked Incentive priorities with FTA partner supply chains can convert preferential market access into genuine export manufacturing capacity rather than just cheaper imports.
- **Build Surge Protection Mechanisms:** Sector-specific safeguard triggers in electronics, steel, chemicals, and textiles should activate automatic investigations when FTA-driven import surges threaten domestic industrial capacity.

