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Daily News Analysis

The Hindu Important News Articles & Editorial For UPSC CSE

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India's external engagement at the **United Nations General Assembly (UNGA) 2023** week highlighted a clear shift towards the **Global South** and an assertive stance on the **Gaza conflict**. External Affairs Minister S. Jaishankar's consultations signaled India's repositioning on multilateral issues such as **UN reforms, global trade, Israel-Gaza conflict, and cooperation with developing nations**. This move reflects India's growing leadership role among developing countries and its balancing act in global geopolitics.

India signals realignment with Global South; adopts assertive line on Gaza

Suhasini Haidar
NEW DELHI

India stepped up its engagement with the Global South quite visibly during External Affairs Minister S. Jaishankar's hectic consultations at the United Nation's 80th high-level week, with strong criticism of Israel's war on Gaza, U.S.-led trade turmoil, and the lack of UN reform in focus in statements.

More than half of his approximately 30 one-on-one bilateral meetings with Foreign Ministers were with countries of the developing nations, while nearly all the multilateral meetings India hosted or Mr. Jaishankar hosted focused on the Global South's issues, and non-western groupings.

The multilateral meetings included the BRICS, IBSA (India-Brazil-South Africa), India-CELAC (South American countries), India-SICA (Central American Integration System), FIPIC (Pacific Island countries), L-69 (developing countries from the Global South) and C-10 (African Union representatives) and the "High-Level Like-Minded countries of the Global South".

Pharma tariffs

Some of the focus on the Global South may have come, suggested analysts, from disappointment with the U.S.'s actions this week. Mr. Jaishankar held a meeting with U.S. Secretary of State Marco Rubio at the beginning of the week, but there was no let-up in the U.S.'s rhetoric and actions against India.

A day after the meeting, President Donald Trump called India and China the "primary funders of the war" in Ukraine, and repeated his claim that he ended the India-Pakistan conflict. In addition to 50% tariffs on Indian goods, and visa and immigration cuts that affect Indian professionals, the U.S. administration also slapped new tariffs on pharma industries this week. Commerce Secretary Howard Lutnick said the U.S. would "fix India" to ensure it opens its markets and cuts trade actions against the U.S.


S. Jaishankar

Meanwhile, Mr. Jaishankar also met with Australian Foreign Minister Penny Wong and his Japanese counterpart on the sidelines of other groupings, but there was no Quad Foreign Ministers' meeting, raising questions about whether a date can still be agreed on for the Quad Summit India is due to host this year.

Washington also ruffled feathers in Delhi with its engagement with the South Asian neighbourhood. Mr. Trump held alks with Pakistan Prime Minister Shehbaz Sharif and Army chief Field Marshall Asim Munir, even as U.S. Ambassador-designate and Special Envoy for the region Sergio Gor met leaders from Bangladesh, Sri Lanka and Bhutan in New York.

In contrast, Mr. Jaishankar met only counterparts from Sri Lanka and Maldives during the week.

Gaza situation

A significant shift at the UNGA week was indicated by India's position on Gaza. New Delhi, which has been an outlier from other Global South countries and abstained on resolutions calling for a ceasefire, was seen backing a number of statements sharply critical of Israel during the UNGA. These included statements by the BRICS Foreign Ministers and the IBSA Trilateral Commission, which said the "Ministers expressed grave concern about the situation in the occupied Palestinian territory and strongly condemned the Israeli attacks against Gaza, which, after almost two years, continue to cause unprecedented suffering to the civilian population of the territory, ravaged by deaths, destruction, forced displacement, and famine".

The statements are much tougher than previous ones that India has agreed to be a part of, indicating a greater alignment with Global South priorities on the issue.

Current Context

1. India & Global South Realignment

- India held ~30 bilateral meetings, largely with **developing nations**.
- Focus was on **BRICS, IBSA (India-Brazil-South Africa), India-CELAC, India-SICA, FIPIC, L-69, and C-10** groupings.
- Aim: Build coalitions with **non-Western, developing nations** for greater voice in global governance.
- India's pitch: "Voice of Global South" → strengthen unity against **U.S.-led trade protectionism** and to push for **UN reforms**.

2. U.S.-India Frictions

- U.S. imposed **tariffs on Indian pharma industries** and continued **visa/trade restrictions**.
- Disappointment in Delhi over U.S.'s lack of support to India's economic interests.
- Despite Jaishankar's meeting with U.S. Secretary of State, no breakthrough.

3. Regional Engagements

- Jaishankar met leaders from **Australia, Japan, Bangladesh, Sri Lanka, Maldives, Bhutan**.
- Absence of Quad meeting raised questions about U.S.'s regional commitment.
- U.S. engagement with **Pakistan PM Shehbaz Sharif and military leadership** created discomfort in India.

4. India's Position on Gaza

- Significant shift: India supported **statements critical of Israel's actions in Gaza**.
- India condemned Israeli strikes causing **deaths, destruction, forced displacement, and famine**.
- Contrast: Earlier India abstained on ceasefire resolutions; now stronger alignment with **Global South's pro-Palestine position**.
- Reflects India's balancing of **strategic ties with Israel** and **moral responsibility with Global South solidarity**.

Static Context (Background for UPSC)

1. **Global South**: Collective term for developing nations of Asia, Africa, and Latin America; demand greater say in global governance.
2. **IBSA & BRICS**: Platforms where India coordinates with emerging economies for multipolarity.
3. **India's Foreign Policy Doctrine**:
    - Strategic Autonomy (non-alignment spirit).
    - Act East Policy&Neighbourhood First.
    - Voice of Global South initiative launched in 2023.
4. **India & Palestine Issue**:
    - Traditionally pro-Palestine (since Nehruvian era).
    - Post-1990s: balanced ties with Israel.

- Current stance: Dual — maintaining Israel ties while supporting Palestine's humanitarian cause.

Implications

1. **Geopolitical**:
   - India emerges as a **bridge** between developed and developing nations.
   - Growing divergence with U.S. on trade & Palestine issue.
2. **Strategic**:
   - Greater role in shaping **Global South agenda**.
   - Strengthens India's claim for **UNSC reforms**.
3. **Domestic**:
   - Shows India's independent foreign policy.
   - Gains support among developing nations, especially Muslim-majority states.

Conclusion

India's visible **realignment with the Global South** at UNGA 2023 and its **assertive position on Gaza** highlight New Delhi's attempt to reclaim leadership of the developing world. While frictions with the U.S. persist, India seeks to champion the cause of **multilateral reforms, equitable trade, and humanitarian values**. For UPSC, this development showcases how **India balances strategic interests with moral responsibility**, reflecting its larger aspiration of being a **Vishwaguru (global leader)** in shaping the new world order.

UPSC Prelims Practice Question

Q. The term Global South often seen in news refers to:

(a) Countries of the Southern Hemisphere only

(b) Developing and less developed nations of Asia, Africa, Latin America

(c) Countries forming the G77 grouping

(d) Nations dependent on southern oceans for trade

Answer: (b)

UPSC Mains Practice Question

Q. "India's proactive engagement with the Global South is a strategic recalibration in its foreign policy." Critically analyze this statement in the context of recent UNGA developments.(250 Words)

Page 04 :GS 2 : International Relations / Prelims

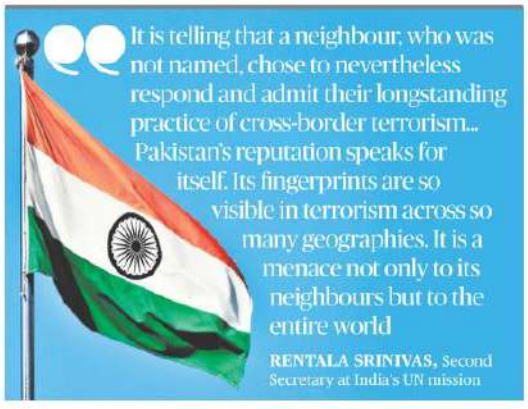
At the **United Nations General Assembly (UNGA) 2023**, India and Pakistan engaged in a sharp exchange over **terrorism and cross-border militancy**. External Affairs Minister S. Jaishankar indirectly accused Pakistan of being a hub of terrorism and linked it to the **Pahalgam terror attack**. Pakistan responded with counter-allegations, leading to a diplomatic tussle that once again highlighted the contentious Indo-Pak ties at global forums.

✦ Current Context

India, Pakistan spar at UN over terrorism and Pahalgam attack

After Pakistan objects to Jaishankar's speech, Indian diplomat exercises right of reply, referring to the neighbouring country as 'Terroristan'

Sriram Lakshman
UNITED NATIONS



India and Pakistan engaged in a back and forth on Saturday evening following India's address to the United Nations General Assembly (UNGA) in the afternoon.

External Affairs Minister S. Jaishankar had, in his UNGA statement, accused Pakistan, without naming the country, of being a hub of terrorism, and emphasised that it was behind the Pahalgam terror attack in April.

India also referred to Pakistan as "Terroristan" in its reply.

Exercising Pakistan's right of reply, a diplomat for the country accused India of maligning Pakistan and said New Delhi had not provided evidence to Islamabad about its involvement in the Pahalgam attack.

India responded to Pakistan's intervention.

"It is telling that a neighbour, who was not named, chose to nevertheless respond and admit their long-standing practice of cross-border terrorism," Rentala Srinivas, a Second Secretary at India's UN mission, said, exercising India's right of reply on Saturday evening.

"Pakistan's reputation speaks for itself. Its fingerprints are so visible in terrorism across so many geographies. It is a menace not only to its neighbours but to the entire world," the diplomat said, adding, "No arguments or untruths can ever whitewash the crimes of Terroristan."

Pak. response

Pakistan's representative made a second intervention, criticising India for distorting its name, calling it a "deliberate attempt to malign and insult an entire people".

He accused India of engaging in destabilising neighbouring countries via its intelligence agencies.

Daily News Analysis

1. India's Position at UNGA

- EAM S. Jaishankar accused an unnamed neighbour (Pakistan) of sponsoring terrorism.
- Emphasised Pakistan's role in the **April 2023 Pahalgam terror attack**.
- Indian diplomat referred to Pakistan as **"Terroristan"**, stressing its global terror footprint.

2. India's Right of Reply

- Rentala Srinivas (Second Secretary at India's UN Mission):
  - Highlighted Pakistan's **long-standing cross-border terrorism**.
  - Said: "Pakistan's fingerprints are visible in terrorism across many geographies."
  - Asserted that terrorism is not just a regional issue but a **global menace**.

3. Pakistan's Counter-Response

- Accused India of:
  - **Maligning Pakistan** without evidence.
  - Distorting its name (objected to "Terroristan").
  - Destabilising neighbours through India's intelligence agencies.

4. Diplomatic Message

- India sought to **internationalise Pakistan's terror record**.
- Pakistan tried to shift narrative by accusing India of destabilisation.
- Reflects India's **assertive diplomacy** in exposing cross-border terrorism.

Static Context (Background for UPSC)

1. **India-Pakistan Relations**
   - Strained since Partition (1947).
   - Kashmir remains the central dispute.
   - Terrorism (esp. since 1989 insurgency) worsened ties.
2. **UNGA Platform**
   - Both nations often use UNGA for diplomatic sparring.
   - India highlights terrorism, Pakistan raises Kashmir issue.

3. **Cross-Border Terrorism**
    - Pakistan-based groups like **LeT, JeM, Hizbul Mujahideen** operate in J&K.
    - India maintains Pakistan provides them **safe havens and funding**.

Implications

1. **For India**
    - Reaffirms India's global narrative: "Pakistan = epicentre of terrorism."
    - Aligns with India's push for **global counter-terrorism conventions**.
2. **For Pakistan**
    - Diplomatic isolation deepens as its terror links are exposed.
    - Domestic instability further weakens its credibility.
3. **For Global Politics**
    - UN platforms continue to be used for bilateral sparring.
    - Global South and West increasingly recognise terrorism as a **shared security threat**.

Conclusion

The UNGA 2023 exchange between India and Pakistan underscores the **deep mistrust** and enduring hostility in their bilateral relations. While India projects Pakistan as a **state sponsor of terrorism**, Pakistan counters with allegations of destabilisation. For India, such assertive diplomacy is crucial to consolidate its image as a **victim of terrorism and a responsible global actor**. The episode reflects how **terrorism remains the central obstacle** in normalising Indo-Pak relations.

UPSC Prelims Practice Question
Q. Which of the following terrorist groups are known to have operated from Pakistan's soil against India?
1. Lashkar-e-Taiba
2. Jaish-e-Mohammed
3. Hizbul Mujahideen

4. Haqqani Network

Choose the correct answer:

(a) 1 and 2 only

(b) 1, 2 and 3 only

(c) 2, 3 and 4 only

(d) 1, 2, 3 and 4

Answer: (b)

UPSC Mains Practice Question

Q. "Cross-border terrorism remains the single largest obstacle to peace and stability between India and Pakistan." Critically examine in the light of recent UNGA exchanges..(150 Words)

Page 06 :GS 2 : Science & Technology / Prelims

India's first dedicated space observatory, **AstroSat**, launched on **28 September 2015** by ISRO using **PSLV-C30**, has completed **10 years of successful operation**. Though its designed mission life was five years, it continues to provide valuable astronomical data. This milestone underscores India's growing stature in **space science and astrophysics research**.

Astrosat, India's first space observatory, completes a decade among the stars

The Hindu Bureau
BENGALURU

India's first dedicated space astronomy observatory, AstroSat, completed a decade of operations on Sunday.

Ten years ago, on September 28, 2015, the PSLV-C30 (XL) rocket carrying AstroSat lifted off from the Satish Dhawan Space Centre in Sriharikota. Though the designed mission life of AstroSat was five years, it continues to provide valuable data.

In the last decade, the multi-wavelength space observatory with five payloads aboard has made major interesting discoveries.

Commemorating the milestone in a post on X, the Indian Space Research Organisation said, "On this day 10 years ago, AstroSat, India's first multi wavelength astronomy observatory was launched by ISRO. From black holes to neutron stars, from the nearest star Proxima Centauri to first time detection of FUV photons from galaxies 9.3 billion light years away, AstroSat enabled groundbreaking insights across the electromagnetic spectrum from UV/Visible to high energy X-rays. Congratulating AstroSat for a successful decade and wishing many more years of exciting results and discoveries."

Keen explorer: Though the designed mission life of AstroSat was five years, it continues to provide valuable data.

Five payloads

AstroSat was designed to observe the universe in the visible, ultraviolet, low and high energy X-ray regions of the electromagnetic spectrum simultaneously with the help of its five payloads.

The five payloads are the Ultra Violet Imaging Telescope (UVIT), Large Area X-ray Proportional Counter (LAXPC), Cadmium-Zinc-Telluride Imager (CZTI), Soft X-ray Telescope (SXT), and the Scanning Sky Monitor (SSM).

Collaborative effort

Astrosat was realised by the ISRO with the participation of all major astronomy institutions, including the Inter University Centre for Astronomy and Astrophysics, Tata Institute of Fundamental Research, Indian Institute of Astrophysics, and the Raman Research Institute (RRI), some universities of India and two institutions from Canada and the U.K.

Current Context

1. **Operational Achievement**
   - Mission life: designed for 5 years → operational for 10 years.
   - Provided key data on **black holes, neutron stars, galaxies, and electromagnetic radiation** across UV, visible, and X-ray bands.
2. **Discoveries & Contributions**
   - First detection of **FUV (Far Ultraviolet) photons** from galaxies 9.3 billion light years away.

- Insights into **black holes, Proxima Centauri, high-energy X-rays, and cosmic phenomena**.
- Enabled **multi-wavelength astronomy** for Indian and global researchers.

3. **Payloads (Instruments)**
   - **UVIT** – Ultra Violet Imaging Telescope
   - **LAXPC** – Large Area X-ray Proportional Counter
   - **CZTI** – Cadmium-Zinc-Telluride Imager
   - **SXT** – Soft X-ray Telescope
   - **SSM** – Scanning Sky Monitor
4. **Collaborative Effort**
   - Developed by ISRO in collaboration with **TIFR, IUCAA, IIA, RRI**, and universities.
   - International partners: Canada & UK.

Static Context (Background for UPSC)

1. **AstroSat's Significance**
   - India's **first multi-wavelength space observatory**.
   - Comparable to NASA's **Hubble Space Telescope** (though smaller).
   - Boosted India's role in **space science diplomacy**.
2. **Astrophysics in India**
   - Key institutions: **TIFR, IUCAA, IIA, PRL**.
   - India now aims for future missions in **X-ray astronomy, solar missions (Aditya-L1), and planetary exploration**.
3. **Space Missions Timeline**
   - Chandrayaan-1 (2008), Mangalyaan (2013), Astrosat (2015), Chandrayaan-2 (2019), Aditya-L1 (2023), Chandrayaan-3 (2023 success).

Implications

1. **Scientific**:
   - Strengthens India's **astrophysics research base**.
   - Provides low-cost, high-quality space data for global scientists.
2. **Strategic**:
   - Enhances India's **soft power in space diplomacy**.
   - Reduces dependency on Western observatories.

3. **Economic/Technological**:
    - Boosts **indigenous satellite technology**.
    - Encourages Indian universities' participation in global research.

Conclusion

The completion of a decade of **AstroSat** is a landmark achievement in India's space journey. By enabling **world-class astrophysical research at low cost**, India has demonstrated its capacity to sustain long-term space missions. With **Aditya-L1** and upcoming **Gaganyaan** missions, AstroSat's legacy paves the way for India's deeper role in **space exploration and global scientific leadership**.

UPSC Prelims Practice Question

Q. Which of the following are payloads of AstroSat?

1. UVIT

2. LAXPC

3. SXT

4. MOMCAM

Select the correct answer:

(a) 1, 2 and 3 only

(b) 1 and 4 only

(c) 2 and 4 only

(d) 1, 2, 3 and 4

Answer: (a)

UPSC Mains Practice Question

Q. "AstroSat marks India's entry into the global community of space observatories." Discuss its significance for India's scientific and strategic interests..(150 Words)

Page :07 : GS 3 Agriculture / Prelims

Maize (Zea mays), domesticated nearly 9,000 years ago in Mesoamerica, is now the world's most widely grown crop and a cornerstone of the global food economy. However, monoculture farming has made maize highly vulnerable to **pests, diseases, and climate change**. A recent study by researchers from **Zhejiang University (China)** in collaboration with partners from **the Netherlands and Switzerland** (published in Science) has revealed that clustering maize plants can enhance their **natural insect resistance** through plant communication.

Daily News Analysis

Clustering maize plants together can improve their insect resistance

In search of sustainable solutions, researchers at China's Zhejiang University, in collaboration with partners from the Netherlands and Switzerland, have uncovered an unexpected and powerful form of plant communication that could strengthen crop resilience to insect attacks; their findings were published in *Science*

Neelanjana Rai

Maize (*Zea mays*) has long stood at the intersection of human culture and the natural world. Originating from teosinte, a wild grass domesticated in Mesoamerica over 9,000 years ago, it was gradually transformed through centuries of selective breeding by Indigenous farmers. From a small-eared plant with a handful of hard kernels, maize thus evolved into the high-yielding, single-stalked crop recognised worldwide today.

Today, maize is the world's most widely grown grain. Beyond food, it underpins global economies as animal feed, biofuel, and a raw material for countless industrial products.

However, its dependence on large-scale, high-density monocultures leaves it vulnerable to pests and diseases. These challenges have been intensified by climate change, especially rising temperature and unpredictable weather. Experts have projected the average global maize productivity could fall by up to 24% by the late 21st century under SSP585, a high-emissions scenario consistent with continued fossil-fuel use.

Warning signals

In search of sustainable solutions, researchers from Zhejiang University in China in collaboration with partners from the Netherlands and Switzerland have uncovered an unexpected and powerful form of plant communication that could strengthen crop resilience. Their study, published in *Science* in August, focused on linalool, a naturally occurring compound known for a floral, woody scent that's used in perfumes and soaps.

The team's findings were based on examining a plant-soil feedback mechanism – a process in which a plant alters the soil environment, which in turn affects the growth and health of the plants.

Plants use the volatile compound linalool as a kind of warning signal. When maize plants are attacked by insects, those in crowded fields release more of it, alerting their neighbours and triggering defensive responses.

The researchers noticed this effect when comparing maize planted at different densities. In the most tightly packed plots, plants in the middle rows suffered far less insect damage than those at the edges. The crowding seemed to boost protection. But this stronger defence came at a cost: plants also grew more slowly and produced less biomass, revealing a trade-off between protection and productivity.

Researchers noted that farmers could harness the linalool-driven feedback to cut chemical use. Representative image. MARKUS SPISKE/UNSPLASH

The researchers found a complex mechanism driving this enhanced defence. When a maize plant was exposed to linalool, it activated jasmonate signalling in the roots. Jasmonates are stress-response hormones in plants, central to the "fight" mode that activates when plants detect pests, wounding, or certain environmental stresses. This, in turn, upregulated genes that triggered the release of a defensive metabolite called HDMBOA-Glc into the soil.

HDMBOA-Glc enriched particular beneficial bacteria, which finally induced salicylic acid signalling in the neighbouring plants, priming them for a wide range of threats.

The team confirmed linalool's role as the sole trigger for this process using a linalool-deficient maize mutant. In these plants, the entire feedback loop failed to occur. When the team applied synthetic linalool, the defensive responses were restored.

Reporter genes

The researchers also found the response launched by this pathway to be very broad-spectrum. Plants conditioned in high-density soil were much less susceptible to an array of agricultural pests and pathogens. For example, larvae of the destructive fall armyworm (*Spodoptera frugiperda*) were rendered less damaging and grew poorly on these plants. Root-knot nematodes (*Meloidogyne incognita*) formed fewer galls on the roots, a sign of reduced infection. The plants also better resisted the fungus *Exserohilum turcicum* and caused the rice black-streaked dwarf virus (RBSDV) to proliferate and infect less.

> Now that we know linalool is a signal, we can engineer plants to either be unresponsive to pests that are not a problem or to provide the signal externally, from a farmer, when plants must be prepared for a pest
>
> JAMES SCHNABLE
>
> PROFESSOR OF AGRICULTURAL GENOMICS AT THE UNIVERSITY OF NEBRASKA-LINCOLN

These outcomes were repeated across experiments, validating the mechanism underlying the defence response.

"There are several scalable approaches that could be used to identify which maize varieties are more or less responsive to linalool signalling," James Schnable, a renowned maize expert and professor of agricultural genomics at the University of Nebraska-Lincoln in the US, said.

One approach is reporter genes. "We could measure the expression of some of the genes downstream of linalool-triggered signalling, such as *Bx1* and *Bx6*, across large and diverse populations of maize and use this information to both identify specific genes with large effects on the perception and response to linalool and introgress these into current high-performing hybrids using marker-assisted selection," Dr. Schnable added.

"Alternatively, we could use the same data to build a genomic prediction model which would use information on thousands of genetic markers across the genome to predict which maize varieties in breeding programs are likely to exhibit greater or lesser responses to linalool."

"It appears the linalool-triggered signalling described in this study is altering the growth/defence trade-off, which all crop and wild plants have to navigate," Dr. Schnable said about the broader implications of the findings.

"Plants can prepare strong defences against insects and pathogens, but these defences come at the cost of energy, which could be devoted to growth and crop yield. Or they can invest their resources in growth and yield, but at the cost of being more vulnerable to pests."

He also stressed that maize plants make these trade-off decisions based only on local cues – while farmers typically have broader knowledge of pest pressures and management strategies.

"Now that we know linalool is a signal that feeds into the plant's decisions about how to manage this trade-off, it is relatively straightforward to engineer plants to either be unresponsive to that signal in environments where insect pests are not a problem (increasing crop productivity) or to provide the signal externally, from a farmer, when plants must be prepared for a pest (reducing crop losses)."

The researchers also wrote that farmers could harness the linalool-driven feedback for breeding and to cut chemical use, and to help farmers manage the growth-defence trade-off in high-density cultivation.

(Neelanjana Rai is a freelance journalist who writes about indigenous community, environment, science and health.neelanjana189@gmail.com)

THE GIST

Maize underpins global economies as animal feed, biofuel, and a raw material for industrial products. However, its dependence on high-density monocultures leaves it vulnerable to pests and diseases. Experts project that maize productivity could decline by 24%

To increase survivability, researchers focused on linalool and a plant-soil feedback mechanism, in which a plant alters the soil. When maize is attacked by insects, those in crowded fields release linalool, triggering defensive responses

Exposure to linalool activates jasmonate, which triggers the release of HDMBOA-Glc into the soil. HDMBOA-Glc enriched beneficial bacteria induce salicylic acid signalling in plants, priming them for threats. The response is broad-spectrum and renders plants less susceptible to pests and pathogens

Current Context

1. **The Research Discovery**
   - Maize plants emit a volatile chemical called **linalool** when attacked by pests.
   - Neighboring maize plants detect this chemical and trigger **jasmonatesignaling**, activating their own defense mechanisms.

- This mechanism enhances resilience to pests without heavy use of pesticides.

2. **Mechanism Identified**
   - Researchers identified a specific transcription factor (**ZmHDMBOA**) regulating linalool response.
   - This helps in producing **defensive metabolites** that reduce pest infestation.
3. **Agricultural Implications**
   - Maize productivity could decline by **up to 24% by mid-century** under climate change scenarios (IPCC reports).
   - This finding offers a **sustainable pest management strategy**.
   - Farmers could cluster maize plants to naturally boost insect resistance, reducing reliance on chemical pesticides.
4. **Genomic Potential**
   - By studying the genome, breeders can predict which maize varieties are more responsive to linalool signaling.
   - Opens pathways for **breeding climate-resilient and pest-resistant maize varieties**.

Static Context (UPSC Relevance)

1. **Maize in India**
   - Grown in Karnataka, Andhra Pradesh, Bihar, Madhya Pradesh, Telangana.
   - Used for food, fodder, ethanol, and industrial products.
2. **Plant Communication**
   - Concept of **allelopathy** and **volatile organic compounds (VOCs)** in agriculture.
   - Similar signaling observed in rice, tomato, and wheat.
3. **UPSC GS-3 Themes**
   - Food security & nutrition.
   - Climate-resilient agriculture.
   - Reducing dependence on pesticides (aligned with SDG 12 & 13).

Implications

1. **Scientific**
   - Opens new research in **plant-to-plant communication**.

- Integration of biotechnology and genomics with traditional farming.

2. **Environmental**
   - Reduces pesticide use → lowers soil and water pollution.
   - Promotes **sustainable agriculture**.
3. **Economic**
   - Lower input cost for farmers.
   - Enhances resilience of smallholders in developing countries like India.

Conclusion

The discovery that **clustering maize plants boosts insect resistance via linalool signaling** represents a significant step toward **sustainable agriculture**. It aligns with India's vision of **climate-smart farming** and offers an eco-friendly alternative to chemical pesticides. If harnessed through research and breeding, this mechanism can strengthen **food security, reduce costs for farmers, and promote ecological balance**.

UPSC Prelims Practice Question

Q. "Linalool" recently seen in news is:

(a) A pesticide used in maize farming

(b) A volatile organic compound emitted by plants to trigger defense

(c) A synthetic fertilizer additive

(d) A new maize hybrid variety

Answer: (b)

UPSC Mains Practice Question

Q. Discuss how recent findings on plant-to-plant communication in maize could transform sustainable agriculture in India.(150 Words)

India is a **young nation**, with more than half its population under the age of 35. While this demographic dividend should signal vitality and productivity, rising cases of **cardiovascular diseases (CVDs) among young adults (20–40 years)** paint a worrying picture. Traditionally seen as an age-related illness, heart disease is increasingly affecting the younger population due to **lifestyle changes, stress, sedentary habits, and poor awareness**. This shift carries profound health, economic, and social implications.

Daily News Analysis

Going beyond the metaphor 'young at heart'

Prathap C. Reddy

Founder and Chairman, Apollo Hospitals Group

In a country where more than half the population is under the age of 35, India should ideally be seen as a land of vitality, vigour, and youthful promise. Yet, the reality is quite disconcerting. Cardiovascular diseases, once considered to be primarily an old age-related affliction, are now increasingly affecting the younger generations. The metaphor 'young at heart' that we would often use to compliment the middle-aged or elderly for their youthfulness and energy is no longer just an expression; it has taken on a serious health connotation.

A worrying trend

In recent years, we are seeing more and more seemingly fit young Indians, in the age group of 20-40, experiencing sudden and, at times, fatal heart attacks. Data from hospitals across India between 2020 and 2023 affirms this rising health crisis, showing 50% of heart attack patients to be under 40 years. The conveniences of modern life, long working hours, sedentary routines, and dietary compromises have gradually contributed to a growing epidemic that threatens the very heart of our society. There is an immediate need for young India to understand that taking care of your heart starts today, regardless of whether you are 18 or 60.

This worrying trend has to be addressed with both urgency and clarity. Dr. Refai Showkathali, Cardiologist, Senior Consultant-Interventional Cardiology, at Apollo Hospitals Chennai, cited the decline in the mean age group of cardiology patients as unmistakable evidence of this trend. He believes that lifestyle has taken over from genetics in contributing to this trend. Earlier, it was accepted that genetics plays an important role in patients having heart attack. If a parent or a close family member had a heart attack in their 40s or 50s, then an individual's chances of having a heart attack in 40s or 50s were also on the higher side.

Cardiovascular diseases, once considered to be primarily an old age-related affliction, are now increasingly affecting the younger generations

He believes that lifestyle has a synergistic effect along with that, and together they take the risk up to 70%.

Echoing his sentiments, Dr. Sengottuvelu G., Cardiologist, Senior Consultant-Interventional Cardiology, at Apollo Hospitals Chennai, attributes the surge in heart attacks among young Indians to hyper competition, smoking and drinking, and lack of sleep resulting from aggressive and fast-paced lifestyles. He attributes 50% of the blame for poor heart health among young adults in India to lifestyle factors. He holds that high-risk individuals can be identified through advanced diagnostic methods such as cardiac calcium scoring or CT coronary angiogram. Once these cases are detected, coronary physiology assessments and detailed imaging help in pinpointing and managing severe, obstructive blockages, ensuring timely and appropriate treatment for those most at risk.

Red flags to look out for

Knowledge is immense power. Today, it is essential for young adults to know and understand how their lifestyle choices impact their long-term health. It is critical for them to understand the subtle warning signs that their bodies may be giving and take proactive steps in in the form of appropriate medical interventions. Symptoms such as discomfort during exercising, sudden chest pain, sweating, unexplained breathlessness, or even ongoing tiredness that makes simple daily tasks hard to get through can be signs that the heart needs attention. These are not minor annoyances; early recognition and prompt medical attention won't just prevent complications, but may also save many young lives.

It is essential that any red flags or early warning signs about potential heart issues are understood and acted upon immediately. Simple lifestyle changes and diligent health check ups can make a significant difference in preventing heart-related complications. By staying alert and active, young adults can greatly reduce their risk of heart attacks and build a foundation for healthy hearts.

The Health of the Nation 2025 report also advises actionable steps, including regular imaging-based screenings beyond lab tests, proactive monitoring of health, a targeted/personalised dietary approach based on expert opinion from doctors, and more. If adopted judiciously by the youth, these can go a long way in helping them prioritise heart health.

As a young nation, we cannot afford to dismiss early onset of heart disease casually. Heart health is not just a medical issue; it is a national concern. The government has been making significant efforts through programmes such as the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke, and Ayushman Bharat, to strengthen healthcare services, promote early detection, and expand access to treatment.

Lack of awareness, however, continues to remain a significant challenge. According to data from 2024, while many Indians are aware of the symptoms associated with heart disease, only 25% could accurately identify the correct symptoms, underlining the need for better public education on heart health. Expanding public education can help every citizen, young and old, know how to recognise and respond to the warning signs of cardiovascular distress, rather than mistake them for common digestive issues or muscle spasms. Also, by training frontline health workers and making diagnostic services more accessible, we can help save countless young lives.

Nurturing a strong, healthy heart is an urgent call for action for our younger generation, for the well-being of individuals today shapes the vitality, power, and resilience of our nation tomorrow.

Current Context

1. **Rising Burden of Heart Disease**
   - Data (2020–23) shows **50% of heart attack patients in India are under 40 years**.

- Key factors: poor diet, high stress, sedentary lifestyle, smoking, drinking, lack of sleep.
- Only **25% of Indians** can accurately identify symptoms of heart disease.

2. **Medical Perspective**
   - Experts (Apollo Hospitals) attribute the surge to **hyper-competition, fast-paced lifestyle, and declining physical activity**.
   - New diagnostic tools like **coronary calcium scoring and CT angiograms** help early identification.
3. **Lifestyle & Awareness**
   - Lifestyle choices (diet, exercise, stress management) significantly reduce risks.
   - Expanding **public health education** and **personalised healthcare approaches** is critical.
4. **Government Interventions**
   - **National Programme for Prevention and Control of Cancer, Diabetes, CVDs, and Stroke (NPCDCS)**.
   - **Ayushman Bharat**: strengthening primary care, insurance coverage, and screenings.
   - Focus on **preventive care** rather than late interventions.

Static Context (UPSC Relevance)

1. **Cardiovascular Diseases (CVDs)**
   - Major cause of mortality worldwide.
   - Risk factors: obesity, hypertension, diabetes, tobacco, high cholesterol.
2. **India's Health Challenges**
   - Double burden: communicable + non-communicable diseases.
   - NITI Aayog's emphasis on **preventive and promotive health**.
3. **GS Paper Links**
   - **GS-2 (Governance & Health policies)** – Role of Ayushman Bharat, NPCDCS.
   - **GS-3 (Science & Technology)** – Diagnostics & preventive technologies.
   - **Essay** – "Health is wealth: A young India's challenge in fighting lifestyle diseases."

Implications

1. **Health System**

- Early screenings, improved diagnostics, frontline health worker training essential.

2. **Economic**
   - Rising healthcare costs and productivity loss due to premature deaths.
3. **Social**
   - Burden on families; reduced demographic dividend.

Conclusion

Cardiovascular diseases in young Indians are no longer rare events but an **emerging public health crisis**. Tackling this requires a **holistic approach**—preventive healthcare, lifestyle modification, awareness campaigns, and robust government intervention. For a youthful India to realise its demographic potential, **heart health must be treated as a national priority**. A healthy heart is not just a medical issue, but a **strategic imperative for India's future growth and well-being**.

UPSC Prelims Practice Question

Q. Which of the following is a government initiative to address non-communicable diseases in India?

(a) Ayushman Bharat

(b) NPCDCS

(c) Fit India Movement

(d) All of the above

Answer: (d)

UPSC Mains Practice Question

Q. Discuss the role of lifestyle, awareness, and government initiatives in combating the rising burden of non-communicable diseases in India. (150 Words)

An Engels' pause in an AI-shaped world

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The other day, Artificial Intelligence (AI) pioneer and Nobel Laureate Geoffrey Hinton, in the *Financial Times*, said that AI will make a few people rich and the rest of us poorer. In doing so, he hinted at an Engels' pause in our modern AI economy.

But what is an Engels' pause? The term refers to a paradox in economic history: in 19th century Britain, industrial output surged, yet ordinary living standards barely budged. It was first called so by Oxford economist Robert Allen, in a seminal paper, after Friedrich Engels, the German philosopher. In early 1800s Britain, wages stagnated, food consumed most household budgets, and inequality widened even as factories hummed, and Britain became the "workshop of the world". Only decades later did sustained improvements in welfare reach the majority, as Allen wrote in his paper.

Today, as AI reshapes the global economy we face a hauntingly similar question: Are we entering a modern Engels' pause, where productivity surges but broad-based prosperity stalls? This becomes particularly pertinent after observing how a recent Stanford paper, titled "Canaries in the Coal Mine? Six Facts about the Recent Employment Effects of Artificial Intelligence", documents younger workers being more vulnerable to AI-induced shifts in the economy. It also comes on the heels of an Indian software giant shedding 12,000 jobs and making an AI pivot. And all of this at a time when a recent MIT study pointed out that 95% of AI pilots are not generating visible gains in organisations due to frictions in complementary capabilities.

So, what precisely gives? For answers we need to turn to the economics of innovation. AI bears the hallmarks of a general-purpose technology (GPT) such as steam power, electricity, and the Internet, and it has the potential to transform multiple industries.

According to Agrawal, Gans, and Goldfarb (2018), AI dramatically lowers the cost of prediction. And yet, GPTs historically unleash not just growth but also dislocation. Complementary innovations, institutional adjustments and new tasks and skills must emerge before benefits are widely shared. Sussex University economic historian Nicholas Crafts discussed this in a 2021 article building on Allen's work, and so did Bojan Jovanović and coauthors (2005) with United States data. The pauses are likely because capital or technological deepening could create gains for oligarch entrepreneurs but not for the rest of us – like Prof. Hinton stated and as a student of this writer pointed out recently.

Some of the markers

What might be the empirical signs of a modern Engels' pause? To start with, we can examine whether there are productivity gains but stagnant wages. In call centres in the Philippines, generative AI copilots have boosted productivity, some argue, by 30%-50%, with firms enjoying cost savings and faster service. Yet, worker wages have barely moved, and in some cases, workloads have intensified. It is also at a time when inflation is high and cost of living prices make workers feel poorer. It is very concurrent with a recent *New Yorker* cartoon too which showed how an individual is asking ChatGPT why her electricity bills are rising. The dark humour cannot be missed on AI's Engels' pauses.

A second sign of a modern Engels' pause is to observe if there are rising costs of complements. AI productivity requires complements: cloud computing, retraining, data access, and cybersecurity. These are expensive. For workers, the "price of staying relevant" is rising, coding boot camps, new certifications and continuous learning. Much like 19th-century households where higher wages were offset by rising food prices, and more recently in the Philippines, where today's workers may see modest wage growth eroded by the high costs of digital survival.

A third marker would be to observe unequal distribution of gains ultimately deepening global inequality. PwC estimates that AI could add $15.7 trillion to global GDP by 2030. But the benefits will be concentrated in the U.S., China, and a handful of firms controlling foundational models. The IMF (2024) estimates that 40% of jobs worldwide are exposed to AI – half in advanced economies, where high-skilled substitution is likely. This bifurcation suggests a delay, or even denial, of welfare gains for large swaths of the global workforce. This writer's paper in the *Journal of Development Economics* shows that a technology race in India with stronger intellectual property laws caused deep wage inequality. Going forward, could this be the story ahead in much of the world?

Finally, job displacement and task transformation will also be early measures to ascertain a modern Engels' pause. Doctors are being complemented with ChatGPT increasingly. A group of researchers from Tsinghua University in China have started the world's first AI-powered hospital. Meanwhile in education, finance, public management or infrastructure management, AI is slowly making inroads and transforming tasks and displacing jobs, as this writer's recent consulting work with GMR Airports also showed or when we see an Albania launch the first AI Minister, Diella.

An Engels' pause in the modern Artificial Intelligence (AI) economy might be shorter than its historical counterpart if policy aligns with innovation

Models to follow, steps to take

Overall, the historical resonance on an Engels' pause is sobering. In the Gilded Age of the U.S., productivity soared. But so did inequality, leading to labour unrest and political upheaval. Only with reforms, trade unions, public schooling and welfare states did living standards broadly rise. The lesson is clear: without AI governance, the Engels' pause may persist.

This brings us to the final point on public policy. How can governments extricate economies out of the malaise of an AI Engels' pause? To start with, skills transitions programmes are going to be key. Singapore offers a promising model. Its SkillsFuture programme provides continuous education credits for workers to reskill. The world's first AI University in Abu Dhabi, the Mohamed bin Zayed University of Artificial Intelligence (MBZUAI) is another example of the role of skilling and new generation AI-related human capital creation.

There also must be thought around redistribution of AI rents, through robot taxes or through Universal Basic Incomes (UBI). Experiments with UBI in the United Kingdom and the European Union, or philanthropic commitments such as the Chan-Zuckerberg Initiative, aim to channel AI gains toward public good.

Finally, AI infrastructure should be treated on a priority basis as a public good. Compute and data are the "food" of the AI economy. If these remain scarce and expensive, productivity gains will not translate into welfare improvements. The launch of K2Think.ai and Apertus from the United Arab Emirates and Switzerland, respectively, in September as public (not private) open AI reasoning models here are nice steps in this direction.

What the challenge is

Some may still argue, with merit, that the Engels' pause analogy is overstated. Unlike in the 19th century, today's societies have stronger welfare systems, democratic institutions (though evidence on democratic backsliding is now quite robust worldwide), and rapid diffusion of technology. Smartphones reached billions within a decade; AI assistants could follow. Moreover, AI's potential to lower costs in health care, education and clean energy could deliver immediate welfare benefits, if governance accelerates deployment equitably. In this sense, the AI Engels' pause might be shorter than its historical counterpart if policy aligns with innovation.

But we still need to be cautious about macro gains and micro stagnation. Political economy teaches us that the Engels' pause is not destiny. Its erasure is also about political will.

The challenge for AI governance students and for policymakers worldwide is thus to ensure that AI is not just a productivity revolution, but a human welfare revolution wherein we ponder on a new theory of change. History warns us that progress delayed is progress denied. So, while the Engels' pause is the ghost at the feast of AI optimism, whether it lingers, how long it lingers and how swiftly it may pass, is up to us.

GS. Paper 03–Science and technology

UPSC Mains Practice Question:Examine the role of AI in boosting productivity while addressing the risks of inequality and job displacement. Suggest policy measures for India.(150 Words)

Context :

Artificial Intelligence (AI) has emerged as a transformative force in the global economy. While AI promises higher productivity and efficiency, concerns are rising about **broad-based prosperity, inequality, and job displacement**. Economist Robert Allen's idea of an **"Engels' pause"**—a historical period in 19th-century Britain when industrial productivity surged but wages and living standards stagnated—serves as an analogy for today's AI-driven disruptions. The critical question: Is AI leading to another Engels' pause in modern times?

- **Current Context**

1. **AI and Productivity Paradox**
    - AI copilots reportedly boost productivity by 30–50%.
    - Yet, mass layoffs (e.g., Indian software giant shedding 12,000 jobs after AI pivot).
    - MIT study: 95% of AI pilots fail to generate visible productivity due to lack of complementary skills.
2. **Winners and Losers**
    - Productivity gains concentrated among **few firms & workers** with complementary skills.
    - High-skilled substitution → middle and low-skilled jobs at risk.
    - IMF estimates: **40% of jobs globally** could be exposed to AI, half in advanced economies.
3. **Global Inequality**
    - Potential to deepen inequality: AI-driven capital concentration vs widespread job losses.
    - Benefits skewed towards **developed nations and big firms**.
    - Developing nations face risk of **digital divide**.
4. **Policy Responses**
    - Singapore: SkillsFuture programme for reskilling workforce.
    - UAE: World's first AI University.
    - India: Need for strong IP laws, public education, and reskilling initiatives.

Static Context (UPSC Relevance)

1. **Engels' Pause (19th century Britain)**
   - Productivity up, wages stagnant, inequality worsened.
   - Improvement came only decades later with welfare reforms.
2. **AI Disruption**
   - Comparable to **Industrial Revolution**.
   - AI's role in automation, healthcare, education, and governance.
3. **UPSC GS Paper Links**
   - **GS-2**: Governance, regulation of disruptive tech.
   - **GS-3**: Science & Tech, Economy, Employment, Inequality.
   - **Essay**: "Technology as a double-edged sword."

Implications

1. **Positive**
   - Boost to productivity, innovation, efficiency.
   - Potential to transform healthcare, education, finance, and logistics.
2. **Negative**
   - Risk of **mass unemployment and wage stagnation**.
   - Increased **income and digital inequality**.
   - Threats to democratic functioning through misinformation.
3. **For India**
   - Opportunity: leverage IT ecosystem for AI growth.
   - Challenge: reskill young workforce, prevent inequality.

Conclusion

AI holds the potential to reshape economies just as the industrial revolution did. However, without robust **governance, regulation, and inclusive reskilling policies**, the world may experience a modern **Engels' pause**, where productivity gains fail to translate into shared prosperity. For India, the challenge lies in harnessing AI for growth while ensuring that its **youth dividend is not lost to inequality and joblessness**. The future of AI must be guided by **responsible innovation and inclusive policies**.


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