

The Hindu Important News Articles & Editorial For UPSC CSE

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India and the European Union (EU) have reached a decisive milestone in their bilateral relations with the conclusion of negotiations for the long-pending India-EU Free Trade Agreement (FTA). The announcement coincides with the India-EU Summit attended by Prime Minister Narendra Modi, European Commission President Ursula von der Leyen, and European Council President Antonio Costa. This development signals renewed strategic convergence between India and the European Union amid shifting global geopolitics.

India, EU close in on FTA as negotiations conclude

Both sides set to announce conclusion of talks as PM Modi and EU leaders, including chief von der Leyen, hold summit today; deal approved by both sides, final text to be ready after 'legal scrubbing'

Suhasini Haidar
T.C.A. Sharad Raghavan
NEW DELHI

A "successful India" is in the world's interest, said visiting European Union (EU) leaders who attended the Republic Day parade on Monday, as officials here confirmed that negotiations for the EU-India Free Trade Agreement (FTA) have been concluded.

"Official level negotiations are being concluded and both sides are all set to announce the successful conclusion of FTA talks on Tuesday," Commerce Secretary Rajesh Agrawal told presspersons on Monday.

Separately, sources in the Commerce Ministry said that negotiations were concluded on Friday and the deal was approved by both sides on Saturday. They added that the final text would be readied once it was "scrubbed" by the legal teams of both sides.

The announcement is part of a number of other agreements, including a security and defence partnership, energy cooperation and a mobility agreement, expected to be signed during the EU-India summit on Tuesday to be



Prime Minister Narendra Modi receives EU chief Ursula von der Leyen at the Republic Day celebrations in New Delhi on Monday. ANI

attended by Prime Minister Narendra Modi, EU Commission President Ursula von der Leyen, and European Council President Antonio Costa.

The EU leaders on Monday witnessed the 77th Republic Day parade where India's military hardware and marching contingents, particularly those involved in Operation Sindoor in May 2025 against Pakistan, were showcased.

'A new global order'

The presence of the EU's top leadership "underscores the growing strength of the India-European Union partnership and our commitment to shared values", Mr. Modi said in a social media post.

"A successful India

makes the world more stable, prosperous and secure," Ms. von der Leyen said in a post, adding that the world's largest democracies Europe and India are committed to shaping "a new global order".

"An opportunity to recall the importance of the action of the EU Naval Forces to enhance maritime security and protect the freedom of navigation, in particular in the Indo Pacific," Mr. Costa said on social media, steering clear of any contentious references to the war in Europe.

Monday's parade also saw EU defence commanders taking part in the event for the first time, while the EU Presidents were later hosted at Rash-

trapati Bhawan by President Droupadi Murmu.

Significantly, much of the hardware that Ms. von der Leyen and Mr. Costa witnessed in Monday's parade was Russian-made or designed and has been sanctioned under various EU sanction packages since Russia's invasion of Ukraine in February 2022.

The EU-India FTA conclusion marks the end of a two-decades-old process, after talks were first launched in 2007. The talks have faltered on a number of occasions, particularly over seemingly irreconcilable issues like market access for "sensitive" European agricultural and dairy items, environmental regulations, investment and immigration.

After a freeze on talks between 2014 and 2022, the talks were relaunched with more pragmatic goals, and both sides have reportedly agreed to set aside sectors where they failed to find common ground.

Once the FTA is announced on Tuesday, officials will complete the legal scrubbing, and it will be sent to all 27 EU states after being translated, before it is ratified by the European Parliament.

Background and Context

India-EU FTA talks were first launched in 2007, making it one of the longest-running trade negotiations for India.

Negotiations stalled multiple times due to differences over:

Market access for European agricultural and dairy products

Environmental and labour standards

Investment protection

Mobility and immigration issues

Talks were frozen between 2014 and 2022, and later relaunched with a more pragmatic, phased approach, allowing both sides to defer contentious sectors.

The current breakthrough reflects changing global realities, including supply-chain diversification, strategic autonomy, and reduced overdependence on specific regions.

Key Features of the Agreement (As Indicated)

Conclusion of negotiations at the official level; final legal text pending "legal scrubbing".

Agreement to exclude or postpone unresolved sectors, avoiding deadlock.

FTA announcement accompanied by:

Security and defence partnership

Energy cooperation

Mobility agreement

Ratification process will involve:

Translation into EU languages

Approval by 27 EU member states

Ratification by the European Parliament

Strategic and Economic Significance

Economic Dimension

The EU is one of India's largest trading partners.

The FTA can boost:

Indian exports in pharmaceuticals, textiles, IT services, and engineering goods

EU investments in manufacturing, green technologies, and infrastructure

Daily News Analysis

Supports India's goal of becoming a global manufacturing and export hub.

Geopolitical Dimension

Reinforces India–EU partnership in shaping a multipolar world order.

EU leaders' statements highlight India's role in global stability, prosperity, and security.

Cooperation in the Indo-Pacific aligns with shared concerns over maritime security and freedom of navigation.

Defence and Strategic Autonomy

EU defence commanders' participation in the Republic Day parade is symbolically significant.

Despite EU sanctions on Russia, the presence of Russian-origin defence equipment underscores:

India's strategic autonomy

The EU's pragmatic engagement with India despite differences on Ukraine

Challenges and Concerns

Domestic sensitivities in India regarding agriculture, dairy, and environmental norms remain.

EU's emphasis on sustainability standards and carbon regulations could affect Indian exporters.

Ratification by all EU member states may be time-consuming and politically complex.

Conclusion

The conclusion of India–EU FTA negotiations marks the end of a nearly two-decade-long process and reflects a mature, interest-based partnership between two major democratic blocs. While the final impact will depend on the details of implementation and ratification, the agreement has the potential to significantly enhance trade, investment, and strategic cooperation.

UPSC Prelims Exam Practice Question

Ques: The term “legal scrubbing”, often seen in the context of international agreements, refers to:

- (a) Verification of economic feasibility of an agreement
- (b) Translation of the agreement into local languages
- (c) Technical and legal review to ensure consistency and clarity
- (d) Parliamentary ratification process

Ans: (c)

UPSC Mains Exam Practice Question

Ques: How can Free Trade Agreements like the India–EU FTA help India balance economic growth with strategic autonomy?
(150 Words)



Page 07 : GS III : Science & Technology / Prelims Exam

A recent scientific study has provided fresh insight into a long-standing question in biology and physics: why do living organisms release far more heat than what is required to offset the decrease in entropy associated with life? Research conducted by scientists from **University of Freiburg**, **STFC Daresbury Laboratory**, and **University of Edinburgh** argues that this excess heat is not wasteful, but an essential cost of maintaining highly controlled, efficient, and adaptable biochemical processes.

Core Idea: Entropy, Energy, and Life

According to the second law of thermodynamics, any system that becomes more ordered must increase disorder (entropy) in its surroundings.

Living systems are highly ordered: cells organise molecules, build precise structures, and regulate thousands of chemical reactions.

To compensate for this local decrease in entropy, organisms release heat into the environment—often referred to as a “heat tax”.

However, the puzzle was that living organisms emit nearly 100 times more heat than what is theoretically needed to balance entropy reduction.

Key Scientific Explanation

The study explains this excess heat through the concept of **far-from-equilibrium chemical reactions**:

Equilibrium vs Non-Equilibrium

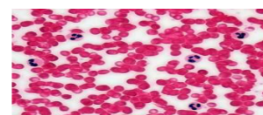
At equilibrium, chemical reactions proceed equally in both directions, producing no net work.

Such systems are stable but biologically useless—they cannot be controlled or directed.

Driven Chemical Cycles

Cells deliberately push reactions far from equilibrium to ensure:

- High precision (e.g., correct amino acid selection in protein synthesis)
- Speed (rapid stress response)
- Robustness (error resistance)



If there is a soup of cells and you make them work together in orderly fashion, you reduce the system's entropy, neuroscience made it easier

Life pays a 'heat tax' to run chemical reactions

Yasudevan Mukunth

Living things dump a lot of heat into their surroundings. The universe is strict about conserving energy. If there is a soup of cells and you make them settle down and work together in orderly fashion, you reduce the system's entropy. In return you need to pay a 'tax' to the universe, to account for the drop in entropy. Scientists have interpreted the heat dumped by living things to be this tax. There is a problem, however: it's two orders of magnitude higher than it needs to be to account for the entropy. What could the rest of the heat be about? A new study by University of Freiburg, STFC Daresbury Laboratory, and University of Edinburgh researchers has argued that life produces so much heat because of how cells optimise their chemistry.

Life releases far more heat than thermodynamics alone requires: a new study suggests that this excess energy helps cells maintain a complex chemistry vital for survival

Cells have thousands of chemical reactions happening all the time. To work well, these reaction networks need to be precise and robust without trading off speed. When cells build proteins, they need to avoid making mistakes like putting the wrong amino acid in the chain. When cells build structures like their 'skeleton', they need to make parts of very particular sizes. And when they respond to stress, like sudden heat, they need to react quickly. The researchers have proposed that cells achieve all these different goals using the same chemical setup, so to speak, i.e. they create chemical cycles that are driven far from equilibrium – like pushing a merry-go-round really hard instead of letting it just slow down once molecules have had their turns on it.

Say there's a reversible chemical reaction: $A \rightleftharpoons B$. At equilibrium, the reaction will reach a balance where A converts to B at exactly the same rate at which B converts to A, so everything will settle into stable proportions and just sit there. Then, say you force the system away from this natural balance by constantly pumping in more and more A. Now the reaction will be driven in one direction and the system will no longer be at rest. This state is said to be far from equilibrium.

In the paper, the researchers focused on a reaction called ATP hydrolysis: $ATP \rightleftharpoons ADP + \text{phosphate}$. At equilibrium this reaction settles into certain proportions of ATP versus ADP. However, cells actively maintain the ratio at about 10 billion times what equilibrium would be, which is extremely far from equilibrium. They do this by constantly making fresh ATP, using up the ATP in cellular reactions, and preventing the reverse reaction from happening much.

When reactions are far from equilibrium, they can do useful work and can be controlled precisely. But when they are at equilibrium they are practically dead; you can't control anything because there is no net energy flow.

Maintaining this imbalance and running all the reaction cycles will necessarily generate an enormous amount of heat. It's effectively a tax cells pay to remain versatile.

The paper's calculations showed that these driven chemical cycles account for a large fraction of the heat that organisms dump. And evolution has apparently decided that this is worth it.

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This requires a **continuous input of energy**, leading to inevitable heat loss.

ATP Hydrolysis as a Central Example

Reaction: $\text{ATP} \rightarrow \text{ADP} + \text{phosphate}$

Cells maintain ATP levels ~10 billion times higher than equilibrium values.

This extreme imbalance allows ATP to function as a universal energy currency.

Constant ATP regeneration and use generates substantial heat.

Why So Much Heat Is Necessary

Heat production is not accidental; it is the price of control and versatility.

Far-from-equilibrium systems allow:

- Directional chemical reactions

- Regulation and coordination

- Adaptability to changing environments

Evolution has favoured energetically expensive but functionally superior biochemical networks.

Broader Scientific Significance

Strengthens the link between thermodynamics and biology.

Helps explain why life cannot exist at equilibrium.

Provides insights into:

- Origin of life studies

- Synthetic biology and artificial cells

- Understanding metabolic efficiency limits

Conclusion

The study reframes biological heat production not as inefficiency, but as an **evolutionary investment**. Life operates far from equilibrium to remain precise, responsive, and adaptable, and the resulting heat is the unavoidable thermodynamic cost of this strategy.

UPSC Mains Exam Practice Question

Ques : The term “far-from-equilibrium” in biological systems refers to:

- (a) Chemical reactions that stop completely after reaching balance
- (b) Reactions driven continuously by energy input to maintain imbalance
- (c) Reactions occurring only at high temperatures
- (d) Random molecular motion without direction

Ans: (b)

UPSC Mains Exam Practice Question

Ques : Living organisms produce far more heat than required for entropy compensation. Explain how far-from-equilibrium chemical reactions resolve this apparent paradox. **(150 Words)**



Page 08 : GS II : Indian Polity / Prelims Exam

On the eve of India's 77th Republic Day, President Droupadi Murmu reflected on India's democratic journey, developmental achievements, and global role as a stabilising force in an increasingly fractured world. Her address highlighted self-reliance, economic progress, national unity, and constitutional values. However, as the editorial "March of the Republic" argues, Republic Day is not only a moment for celebration but also for introspection on how faithfully constitutional ideals are being realised in practice.

March of the Republic

While celebrating achievements, the government must not ignore challenges

Key Themes in the President's Address

Self-Reliance and National Achievements

- Emphasis on Atmanirbhar Bharat, particularly in defence capabilities.
- Reference to Operation Sindoor as an example of precision and indigenous strength.
- Optimism about India's trajectory towards becoming the **third-largest global economy**.
- Commendation of structural reforms such as **GST** and the **new Labour Codes**.

Democracy, Culture, and National Integration

- Tribute to **Sardar Vallabhbhai Patel** for national integration.
- Recognition of Vande Mataram as a "lyrical national prayer" on its 150th anniversary.
- Acknowledgement of the role of women, farmers, sanitation workers, teachers, scientists, and healthcare professionals in nation-building.

Constitutional Nationalism

- Invocation of the Constitution as the foundation of India's democratic identity.
- Republic Day presented as a reaffirmation of constitutional ideals and duties.

Editorial Critique and Deeper Concerns

The editorial underscores that **economic growth and military prowess alone are insufficient markers of national progress**. It raises critical concerns:

President Droupadi Murmu reflected on India's democratic and development journey on the eve of India's 77th Republic Day. Her emphasis was rightly on the self-reliance of the country in all fields and India's role as a messenger of peace and stability in a world that is increasingly fractious. Ms. Murmu highlighted recent national achievements and touched upon political and cultural themes that are currently the priorities of the Centre. She noted that the national song, Vande Mataram, was a "lyrical national prayer" even as the country celebrates the 150th anniversary of its composition, and also paid tribute to Sardar Vallabhbhai Patel, whose 150th birth anniversary was celebrated recently, for his role in unifying the nation. The commander-in-chief also hailed the success of Operation Sindoor, which involved precision strikes against terror infrastructure, and credited it to India's growing self-reliance in defence. The President said India's progress towards becoming the third largest global economy was well on track, and commended economic reforms such as the GST and the new Labour Codes. She noted the great strides achieved by the country's women in fields ranging from agriculture to space, and their critical role as voters. Farmers, sanitation workers, teachers, scientists, and healthcare professionals also found special mention in the President's speech.

The President invoked the idea of constitutional nationalism. Republic Day celebrations are an annual occasion to revisit the ideals of the Constitution and to review its progress in principle and practice. Cataloguing the achievements of the country is motivating, but also essential on such occasions is self-reflection. Economic growth or military prowess are not the sole markers of progress for any nation. Singing paeans to the Constitution is one thing, but delivering on its principles by protecting the rights of citizens and discharging the duties of the state is quite another. The state in its self-congratulatory posture, as reflected in the President's speech, must not ignore the many struggles of the citizenry that persist even in the eighth decade of the Republic. Civilisational pride cannot be a ruse to overshadow the material questions of the present. Republic Day celebrates the ideals of the Constitution. Secularism, the weakening of the federal character of the Republic, and corruption should not be allowed to undermine those ideals.

Gap between Constitutional Ideals and Practice

Celebration of the Constitution must be matched by protection of **fundamental rights** and accountability of the state.

Constitutional nationalism should not become symbolic rhetoric devoid of substantive implementation.

Persisting Democratic Challenges

Sectarian politics and social polarisation.

Perceived weakening of **federalism**.

Enduring issues of corruption and governance deficits.

Socio-economic struggles of citizens that remain unresolved even in the eighth decade of the Republic.

Civilisational Pride vs. Present Realities

Pride in civilisational heritage should not obscure urgent material and institutional challenges such as employment, inequality, and social justice.

Conclusion

Republic Day is not merely a celebration of past achievements but a constitutional audit of the present. While India's progress in economic reforms, defence self-reliance, and global stature is significant, the strength of the Republic ultimately rests on how sincerely constitutional principles are upheld in everyday governance. As the editorial cautions, self-congratulation must not eclipse self-correction. Upholding democracy, federalism, and citizen rights remains the true test of the Republic's march forward.

UPSC Mians Exam Practice Question

Ques: What is meant by 'constitutional nationalism'? Examine how sectarian politics and weakening federalism can undermine this idea in practice. **(1520 Words)**

Page 08 : GS III : Indian Economy / Prelims Exam

India is widely projected as a young nation poised to reap a demographic dividend, yet a closer look reveals a **highly** uneven demographic transition across States. A recent report by the Reserve Bank of India (RBI) highlights that southern States such as Kerala and Tamil Nadu are rapidly ageing, while northern States like Bihar and Uttar Pradesh will continue to have expanding working-age populations. The editorial "Mind the time" argues that this transition poses deep fiscal, social, and ethical challenges that cannot be addressed by narrow fiscal prescriptions alone and calls for state-funded geriatric care as a policy priority.

Mind the time

India needs public-funded geriatric care to take care of its elderly

While India is often celebrated for its demographic dividend, its States are undergoing a significant but uneven demographic transition. According to a new RBI report, Kerala and Tamil Nadu will be "ageing States" by 2036 because their elderly populations will exceed 22% and 20%, respectively. On the other hand, the working age populations of Bihar, Uttar Pradesh, and Jharkhand will continue to rise beyond 2031. Karnataka and Maharashtra occupy the middle ground, balancing growth with the onset of ageing pressure. In response, the RBI has advised ageing States to "rationalise" their subsidies to afford rising pension costs and youthful States to "invest heavily in human capital". But how mindful is the RBI's fiscal advice of the political undertones? Southern States, having successfully tamed population growth, face a double whammy: lower Central tax devolution because population weightage in Finance Commission formulae favours the populous northern States plus lower parliamentary representation due to the upcoming delimitation exercise. On the other hand, while the youthful States have a "window of opportunity" to boost growth using a larger workforce, the share of their spending on education has stagnated or declined, and the question of employability persists. These people will also enter the workforce at a time of manufacturing automation and AI in industry, so the RBI's suggestion to "boost labour-intensive sectors" may leave these States vulnerable to the possibility of ageing before they get rich.

Research has shown that ageing in India disproportionately affects women, who often live longer but with fewer financial assets. The RBI's focus on "workforce policy" overlooks the majority of elderly women who were never in the formal workforce and thus have no pension. The RBI model also assumes some level of family support, but with migration and nuclear families becoming the norm, the informal safety net is collapsing. Ultimately, the demographic transition cannot be managed by fiscal changes alone. First, a new industrial policy is needed to create jobs en masse in new sectors such as green energy and the care economy. Second, the youthful States must build healthcare and pension services now to avoid fiscal shocks if and when the replacement fertility rate drops. Third, for most of India's elderly, the future looks less like "graceful ageing" and more like financial dependency, unless the state drastically expands social pensions; but this directly contradicts the RBI's call for fiscal consolidation. Finally, without a massive expansion of public geriatric care, the "graceful ageing" that the report envisions will be available only to the wealthy.

Key Findings of the RBI Report

Ageing States:

Kerala (elderly >22% by 2036)

Tamil Nadu (elderly >20% by 2036)

Youthful States:

Bihar, Uttar Pradesh, Jharkhand — working-age population rising beyond 2031

Intermediate States:

Maharashtra and Karnataka — balancing growth with emerging ageing pressures

RBI's Policy Advice:

Ageing States should rationalise subsidies to manage pension burdens.

Youthful States should invest heavily in human capital to exploit their workforce advantage.

Critical Issues Raised by the Editorial

Fiscal Advice and Political Economy

Southern States face a **double disadvantage**:

Daily News Analysis

Reduced Central tax devolution due to population-based Finance Commission formulae.

Potential loss of parliamentary representation due to future delimitation.

These States are effectively penalised for successful population control.

Questionable Assumptions about Youthful States

Despite a demographic “window of opportunity,” spending on education in many youthful States has stagnated or declined.

Employability remains weak, raising doubts about realising demographic dividend.

Automation, AI, and capital-intensive manufacturing may reduce labour absorption, risking a scenario of “**ageing before getting rich.**”

Gendered Nature of Ageing

Ageing disproportionately affects **women**, who:

- Live longer

- Have fewer assets

- Often lack pensions due to absence from formal workforce

RBI's workforce-centric model ignores this structural reality.

Erosion of Informal Safety Nets

Assumptions of family-based elderly care are weakening due to:

- Migration

- Urbanisation

- Nuclear family structures

This makes state intervention unavoidable.

Why Fiscal Measures Alone Are Insufficient

Demographic transition is a **structural transformation**, not just a fiscal challenge.

RBI's emphasis on fiscal consolidation conflicts with:

- Need to expand **social pensions**

Rising healthcare and long-term care costs

Without intervention, ageing will mean **financial dependency rather than dignified ageing** for most elderly Indians.

Policy Imperatives Suggested

New Industrial Policy

Job creation at scale in:

Green energy

Care economy

Health and social services

Pre-emptive Welfare Systems in Youthful States

Build healthcare, pension, and social security systems before fertility rates fall.

Expansion of Social Pensions

Especially for elderly women outside formal employment.

Publicly Funded Geriatric Care

Universal access to elderly healthcare and long-term care.

Prevent "graceful ageing" from becoming a privilege of the wealthy.

Conclusion

India's demographic future is not uniformly youthful; it is fragmented and fast-changing. While fiscal prudence is important, managing ageing requires structural policy shifts, especially in healthcare and social security. Without a massive expansion of publicly funded geriatric care, India risks deepening inequality among its elderly population. The challenge is not merely to grow rich or old, but to ensure that ageing in India is dignified, inclusive, and constitutionally just.

UPSC Prelims Exam Practice Question

Ques: The term "ageing before getting rich", often used in demographic studies, refers to:

- (a) Rapid ageing of population due to high life expectancy in developed countries
- (b) Population ageing occurring before achieving high per capita income levels
- (c) Decline in working-age population due to migration
- (d) Ageing caused by high old-age dependency ratio in rich economies

Ans: b)

UPSC Mains Exam Practice Question

Ques: Ageing in India has a distinct gender dimension. Discuss the socio-economic challenges faced by elderly women and suggest policy measures to address them. (150 Words)

Page 10 : GS II : International Relations

The decision of the United States to withdraw from several international organisations, including the International Solar Alliance (ISA), has raised questions about the future of global solar cooperation and India's leadership in climate diplomacy. As ISA is a flagship initiative jointly led by India and France, the move has implications not only for global climate governance but also for developing countries that depend on multilateral support for renewable energy transitions.

How will U.S. exit affect solar alliance?

When was the International Solar Alliance first set up? Where is it based? Will U.S. actions affect India's solar module manufacturing capacity? What about investments in solar power projects? How will it affect African nations and other poorer developing countries?

EXPLAINER

Kunal Shankar
Shikha Kumari. A

The story so far:

On January 7, the U.S. government announced that it would withdraw from 66 international organisations. The reason given was that these bodies no longer served American interests. Among them were major climate platforms, including the International Solar Alliance (ISA), an organisation headquartered in India and jointly led by India and France.

What is the ISA?

The ISA was set up in 2015 to make solar power cheaper and easier to adopt, especially in developing countries. While it doesn't build solar plants itself, it helps countries access finance, reduce risk for investors, and speed up solar adoption. Today, the Alliance has over 120 member countries and works across Africa, Asia, and island nations. The U.S. joined fairly late, in 2021. Over three years, it has contributed around \$2.1 million.

How will U.S. exit affect the ISA?

The U.S. exit will not really harm the alliance financially. U.S. contribution made up only about 1% of the Alliance's total funds. Indian officials have already said that the ISA's day-to-day work will continue, and that ongoing programmes will not be shut down. Moreover, training and capacity-building efforts are still in place.

But economics is not only about budgets, it's also about confidence. And that's where the ripple effects begin.

What about India's solar industry?

As India does not depend on the U.S. for solar panels or key equipment, solar power will not become more expensive. In fact, India now makes a large share of solar components on its own. As of late



A stress factor: President Droupadi Murmu addresses the inaugural session of the Eighth International Solar Alliance Assembly, in New Delhi on October 28, 2025. ANI

2025, India's solar module manufacturing capacity was close to 144 gigawatts. Solar cell manufacturing was around 25 gigawatts and is growing fast, with Indian companies investing across the entire supply chain.

Moreover, China is by far the largest producer of high-efficiency mass market solar modules and cells, with 70% of the global cell producing capacity. In fact, India imported about \$1.7 billion worth of Photovoltaic (PV) modules from China in FY25, as per a Ministry of New and Renewable Energy (MNRE) report in Parliament.

This makes it clear that the recent U.S. decision does not push up project costs in India. It does not affect electricity tariffs either. For consumers, nothing changes.

Will investments slow down?

Again, unlikely. Most solar projects in India are driven by domestic demand. They are backed by long-term contracts with state utilities and central agencies. Investors look at India's power demand, policy stability, and growth potential.

The U.S. is not the main source of funding for Indian solar projects. Indian banks, global funds, and development institutions continue to invest based on India's market fundamentals. So the pipeline of projects inside India remains intact. Even with respect to jobs, India is relatively well-protected. Solar jobs in India come mainly from manufacturing, installation, and operations within the country. Since India is rapidly building a strong local manufacturing capacity,

these jobs are not affected by U.S. climate policy. There is even a possible upside. As the U.S. becomes more inward-looking and slows renewable approvals at home, it may still need clean energy equipment. With the U.S. having supply tensions with China and Mexico, Indian manufacturers could find openings, either through exports or by setting up units that meet U.S. standards. A lot however, hinges on the ongoing talks for a bilateral trade agreement between New Delhi and Washington.

Where is the real economic risk?

Mostly outside India. The ISA works extensively in Africa and poorer developing countries. These regions depend heavily on cheap loans and international cooperation to build solar projects. When a large economy like the U.S. steps back from climate engagement, lenders can turn cautious; projects can slow down; and decisions can take longer. If solar growth slows in these regions, Indian companies looking to expand abroad may feel the impact.

The ISA is also one of India's key tools for climate leadership and diplomacy in the Global South. It helps India build influence, open markets, and support Indian companies overseas. While the U.S. exit removes one influential partner and some technical expertise, it does not change who leads the alliance. India still does. That leadership now comes with more responsibility.

What next?

Solar power in India does not become costlier, domestic projects are not threatened, and jobs inside India remain secure. The real challenge then is a more divided global climate landscape, where cooperation is harder and emerging markets need to work harder to attract finance. For India's solar industry, this is not a shock. It is a stress test. And compared with where it stood a few years ago, India appears to be better prepared to handle it.

THE GIST

▼ The U.S. exit will not really harm the alliance financially. U.S. contribution made up only about 1% of the Alliance's total funds.

▼ Most solar projects in India are driven by domestic demand. They are backed by long-term contracts with state utilities and central agencies.

▼ The ISA works extensively in Africa and poorer developing countries. When a large economy like the U.S. steps back from climate engagement, lenders can turn cautious

1. When was the International Solar Alliance set up and where is it based?

The ISA was **launched in 2015**, on the sidelines of COP21 in Paris.

It was spearheaded by India and France to promote solar energy deployment in tropical countries.

The ISA Secretariat is headquartered in **Gurugram, Haryana (India)**.

It currently has **over 120 member countries**, primarily from Africa, Asia, Latin America, and Small Island Developing States.

2. Will the U.S. exit affect ISA's functioning?

Financial impact is minimal:

The U.S. joined ISA only in 2021.

Its contribution (about \$2.1 million over three years) accounts for **around 1% of ISA's funds**.

Core ISA activities—capacity building, training, and facilitation of finance—will continue.

However, the exit does affect **confidence and signalling**:

Reduced participation by a major economy can make global lenders and investors more cautious.

Climate cooperation becomes more fragmented.

3. Impact on India's solar module manufacturing capacity

No adverse impact on India's solar manufacturing:

India does not rely on the U.S. for critical solar equipment.

As of late 2025:

Solar module manufacturing capacity \approx **144 GW**

Solar cell capacity \approx **25 GW**, expanding rapidly

India has built domestic manufacturing across the value chain under self-reliance policies.

India continues to import modules (notably from China), but the U.S. exit does **not raise costs or tariffs** for Indian solar projects.

4. Impact on investments in solar power projects in India

Domestic solar investments are unlikely to slow down:

Driven mainly by India's internal power demand.

Supported by long-term power purchase agreements (PPAs).

Funded largely by Indian banks, global funds, and development finance institutions.

Solar jobs in India are concentrated in manufacturing, installation, and operations—mostly domestic.

Potential upside:

If the U.S. reduces renewable expansion domestically and maintains trade frictions with China, **Indian manufacturers may find export opportunities**, subject to trade negotiations.

5. Impact on African nations and poorer developing countries

This is where the **real risk lies**:

Many African and low-income countries:

Depend on concessional finance and multilateral confidence.

Rely on ISA-backed facilitation to reduce investment risks.

U.S. withdrawal may:

Make lenders more cautious.

Delay project approvals.

Slow solar deployment in vulnerable regions.

This could indirectly affect Indian companies seeking overseas expansion.

6. Strategic and diplomatic implications for India

ISA is a key instrument of India's Global South diplomacy.

It enhances India's role as:

A climate leader

A technology partner

A development facilitator

With the U.S. exit:

India's leadership within ISA remains unchanged.

But India now bears greater responsibility to sustain momentum and mobilise finance.

Conclusion

The U.S. exit from the International Solar Alliance does not threaten India's domestic solar industry, manufacturing capacity, investment pipeline, or employment. The real concern lies in the global climate cooperation deficit, especially for poorer developing countries that rely on multilateral confidence and concessional finance. For India, this moment is less a disruption and more a stress test—one that underscores its growing capacity, leadership in renewable energy, and responsibility toward the Global South.

UPSC Mains Exam Practice Question

Ques : The withdrawal of the United States from the International Solar Alliance (ISA) highlights the growing fragmentation in global climate governance. **(150 Words)**

Page : 08 : Editorial Analysis

India's biggest climate gap could be language

If there is one serious gap in science communication, it is the language and jargon. In the absence of effective communication based on clearly understandable language that people can relate to and contextualise, science will always be either poorly understood or misunderstood.

The meaning of loss and damage

At recent United Nations climate conferences, few phrases have been repeated as often as 'Loss and Damage'. It has been invoked at negotiations, stitched into drafts, and debated in press briefings as if its meaning were universally understood. But Loss and Damage is not simply a diplomatic vocabulary; it refers to climate impacts that communities cannot adapt to: the destruction of crops and homes, but also the loss of identity, land, traditions, ecosystems, and the quiet erosion of cultural memory. It is meant to capture not just what is broken, but what can never be restored. And yet, somewhere between the global negotiation table and the governance realities on the ground, the meaning collapses.

In India, the language shifts sharply as it moves downstream. Loss becomes *nuksaan aaklan* – an assessment to be filled after a disaster. Damage becomes *haani purti* – compensation calculated through established norms. The broader crisis becomes *aapda*, *aapda rahat*, or *aapda prabandhan* – administrative categories shaped by decades of disaster response, not by the complex realities of climate change.

So, when global actors speak of 'Loss and Damage finance', it is often understood locally as a little more than post-disaster relief – a far narrower understanding than the international framing, which also encompasses slow-onset impacts, biodiversity loss, the disappearance of ancestral lands, and the erosion of social fabric.

The fuller spectrum of irreversible climate loss collapses into what can be counted,



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personal



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Views are personal

We have more data than ever, but less clarity on where it matters most

compensated, and closed. This is not a minor semantic problem; it is a governance gap. When climate language narrows, so do the policy responses it enables – even the most ambitious global commitments risk becoming abstractions.

Over the past decade, India's climate science has advanced rapidly. We now have district-level heat projections, urban flood models, crop yield simulations, and attribution studies capable of tracing the fingerprints of climate change on specific extreme events. Yet, this capacity has not been matched by investment to make the science usable for decision-makers and communities. The result is a paradox: we have more data than ever, but less clarity on where it matters most.

A district magistrate may receive a vulnerability assessment packed with indices and statistical language, but struggle to translate it into tomorrow's decisions. Communities, meanwhile, also encounter climate messaging through fragmented channels, each using different vocabulary and urgency. Too often, climate communication assumes that more information leads to better decisions. But this approach rarely holds. People don't act simply because they know more; they act when information feels relevant, doable, and aligned with their lived reality.

This is why communication is not a "soft" add-on to climate policy but a core enabler of delivery. Heat advisories that tell people to "stay indoors between 12 and 3 p.m." assume the privilege of being able to stop work. Flood warnings delivered by SMS assume literacy and smartphone access. Meanwhile, risk dashboards proliferate across States and cities, often technically impressive yet underused because they are too complex and not designed around how real decisions are made under pressure.

When climate information is clear, trusted, and grounded in everyday realities, the entire climate ecosystem shifts: policy becomes sharper,

communities respond faster, and investments flow towards solutions that work. For instance, Odisha's cyclone preparedness model shows that evacuation success does not come from technology alone. It comes from years of building public confidence in the credibility of alerts issued by the state. Trust becomes a form of infrastructure as critical as shelters or sensors.

Clear communication can similarly strengthen heat preparedness, guide flood response, and help governments justify climate investments by translating risk into everyday consequences: school closures, water shortages, hospital admissions, labour productivity, and crop loss.

What climate communication must deliver

Effective communication begins with use. It turns projections into decisions: not just 'heat index rise', but what it means for school timings, outdoor work, and public health preparedness; not just 'flood return intervals', but how flooding will affect commute routes, household safety, and service delivery in specific neighbourhoods. And it works best when co-created with frontline workers, panchayat leaders, farmers, fisherfolk, teachers, and local journalists.

If we are serious about turning climate science into climate action, it needs a communication framework as intentional as its forecasting systems and policy mechanisms. That means simplifying climate information, localising it for real contexts and languages, humanising science through lived realities, institutionalising communication capacity within government systems, and strengthening media partnerships so risk narratives are understood, trusted, and acted upon.

When communication fails, science stays locked in reports, policies don't translate into practice, and preparedness remains uneven; and when it succeeds, resilience becomes a shared social and political possibility.

GS Paper III : Environment

UPSC Mains Practice Question: Explain how the global concept of 'Loss and Damage' gets diluted when translated into local administrative language in India. What are the governance implications of this semantic narrowing? **(250 Words)**

Context :

India has made significant advances in climate science, modelling, and data generation, yet a crucial gap persists between knowledge and action. As argued by Flavia Lopes, Programme Officer at United Nations Environment Programme (UNEP) India, this gap is not technological or financial alone, but linguistic and communicative. The inability to translate complex climate concepts into locally meaningful language has emerged as one of India's most under-recognised barriers to effective climate governance.

The Core Argument: Language as a Governance Gap

Loss and Damage: From Global Concept to Local Dilution

Internationally, Loss and Damage refers to irreversible climate impacts that cannot be adapted to — including loss of livelihoods, ecosystems, cultural identity, and ancestral land.

In India's administrative context, it is reduced to:

Nuksaan aaklan (damage assessment)

Haani purti (compensation)

Aapda prabandhan (disaster management)

This translation narrows a structural climate crisis into a post-disaster relief exercise, undermining long-term policy responses.

Semantic Reduction → Policy Reduction

What cannot be easily quantified (culture, identity, biodiversity) is excluded from governance frameworks.

As language narrows, policy imagination shrinks, turning global climate commitments into procedural checklists rather than transformative action.

Science–Policy–People Disconnect

India now possesses:

District-level heat projections

Urban flood models

Climate attribution studies

Crop yield simulations

Yet, **decision usability is weak:**

District officials struggle to convert technical indices into operational decisions.

Communities receive fragmented, jargon-heavy messages that lack relevance to daily life.

This creates a paradox: **more climate data, but less actionable clarity.**

Why Communication Is Not a “Soft” Issue

The article challenges the notion that communication is secondary to “hard” policy:

Assumptive Messaging Failures

Heat advisories assume people can stop working.

SMS flood alerts assume literacy and smartphone access.

Technocratic Overreach

Risk dashboards and climate portals are often underused because they are not designed around real-world decision-making under stress.

Effective climate communication is therefore an enabler of delivery, not an add-on.

Trust as Climate Infrastructure

Odisha’s cyclone preparedness model demonstrates that:

Early warning success depends less on sensors and more on public trust.

Years of credible, consistent communication turned alerts into actionable signals.

Trust functions as **social infrastructure**, as vital as physical infrastructure.

What Climate Communication Must Deliver

From Abstraction to Everyday Impact

Daily News Analysis

Translate “heat index rise” into school timings, labour safety, and hospital preparedness.

Translate “flood return periods” into commute disruptions, household risk, and service delivery failures.

Localisation and Co-Creation

Messages must be co-designed with:

Panchayat leaders

Frontline workers

Farmers, fisherfolk

Teachers and local journalists

Institutionalisation

Build communication capacity within government systems.

Strengthen media partnerships to ensure climate risk narratives are trusted and acted upon.

Conclusion

India’s climate challenge is no longer limited by lack of data or scientific capability, but by its failure to speak climate in languages that people live by. When climate communication fails, science remains trapped in reports, policies stagnate at the top, and resilience becomes uneven. When it succeeds, climate action becomes collective, credible, and just. Bridging this linguistic and communicative gap is therefore not peripheral—it is central to transforming climate science into climate resilience.