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Southwest monsoon has advanced into Andaman Sea: IMD

Heavy rainfall, accompanied by thunderstorms and lightning, expected over Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu this week

Jacob Koshy
NEW DELHI

The India Meteorological Department (IMD) announced on Tuesday that the southwest monsoon has advanced into some parts of the south Bay of Bengal, the south Andaman Sea, Nicobar Islands, and parts of the north Andaman Sea.

Usually, the monsoon system, which splits into two branches, takes about 10 days to reach mainland India from this region, although the agency has not yet revealed a date for the monsoon's onset over Kerala.

The agency is expected to announce an official date later this month, and uses a custom forecast model for this purpose. The normal onset date of the monsoon over Kerala is June 1.

Meteorologists have stated that an early arrival in the Andaman Sea would not necessarily mean the monsoon would reach Kerala earlier.

Last month, the IMD said India is likely to receive "above normal" monsoon rainfall, defined as 5% more than the historical average of 87 cm.

Weather forecasts predict heavy rain in south peninsular India over the week. FILE PHOTO

If this prediction holds true, it would be a second year of "above normal" rain. Last year, India received rainfall 8% above the historical average from June to September.

In 2024, the southwest monsoon set in over Kerala on May 30, two days before the normal date and a day before the forecast date of May 31. It was also unusual in that both branches of the monsoon simultaneously set in over northeast India and Kerala. The two branches eventually merge over central India and sustain the southwest monsoon until the end of September.

"Rainfall accompanied by thunderstorms and lightning will likely continue over south peninsular India and adjoining central India for the next five days, with heavy rainfall also expected over Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu this week. Heavy to very heavy rainfall accompanied by thunderstorms and lightning is likely over northeast India during the next five days," the IMD said in a statement on Tuesday.

Key Factual Highlights:

- **Announced by:** India Meteorological Department (IMD)

- **Monsoon has reached:**
  - South Bay of Bengal
  - South Andaman Sea
  - Nicobar Islands
  - Parts of North Andaman Sea
- **Expected Time to Reach Mainland (Kerala):**
  - Usually ~10 days after reaching the Andaman Sea
  - Exact onset date over Kerala to be announced later by IMD (usually around June 1)

Prelims-Relevant Concepts:

1. Southwest Monsoon Onset:

- Normal Onset over Kerala: 1st June
- First area to be covered: Andaman & Nicobar Islands, then progresses northwestward

2. Significance of Monsoon Onset:

- Marks the beginning of the rainy season in India
- Crucial for agriculture (kharif crop sowing)
- Impacts water reservoirs, power generation, rural employment

3. IMD Monitoring Parameters:

- To declare monsoon onset over Kerala, IMD checks:
  - Rainfall patterns over specific stations
  - Wind speed and direction (westerlies at 850 hPa)
  - Outgoing Longwave Radiation (OLR) values
  - Moisture presence (precipitable water).

UPSC Prelims Practice Question

Ques : With reference to the southwest monsoon in India, consider the following statements:

1. The normal onset of monsoon over Kerala is around the third week of May.

2. The southwest monsoon first arrives in the Andaman and Nicobar Islands before reaching the mainland.

3. The India Meteorological Department (IMD) uses wind pattern and rainfall criteria to declare the monsoon onset.

Which of the above statements is/are correct?

a) 2 and 3 only

b) 1 and 2 only

c) 1 and 3 only

d) 1, 2 and 3

Ans : b)

India has officially notified the World Trade Organization (WTO) about its plan to impose retaliatory tariffs on $7.6 billion worth of U.S. imports. This is in response to the U.S. imposing 25% tariffs on steel and aluminium imports, including from India, citing national security.

India notifies WTO of plan to impose retaliatory tariffs on U.S. imports

This comes in retaliation for the imposition of 25% import duties on steel and aluminium by U.S.; India says that proposed measures will be in form of a suspension of concessions or other obligations on selected products originating in the U.S.

T.C.A. Sharad Raghavan
NEW DELHI

At a time when India and the U.S. are in talks over a trade deal, fresh tensions have emerged as India has notified the World Trade Organization (WTO) of its proposal to impose tariffs on $7.6 billion worth of imports from the U.S. in retaliation for that country raising its import duties on steel and aluminium to 25%.

According to a communication from the WTO, India's reciprocal measures could kick in 30 days from the date it sent its notification to the WTO – May 9. The WTO said it was circulating the communication "at the request of the delegation of India".

The matter first became a point of friction during U.S. President Donald Trump's first term, when in 2018, he had first imposed higher tariffs on steel and aluminium imports. Then, in February 2025, with effect from March, at the start of his second term, he modified this by imposing tariffs of 25% on imports of steel and aluminium and removing all country-specific and product-specific exemptions that most countries had managed to obtain.

India's move to impose tariffs on American imports is in response to the U.S. raising its import duties on steel. REUTERS

While the U.S. had declined overtures from India in April for talks over the matter, saying these higher tariffs were not safeguard measures but were taken in the interest of national security, India has maintained that they are safeguard measures.

India's reciprocal measures could kick in 30 days from the date it sent its notification to WTO

"The measures have not been notified by the United States to the WTO, but are, in essence, safeguard measures," India asserted in its communication to the WTO. "India maintains that the measures taken by the United States are not consistent with the General Agreement on Tariffs and Trade, 1994 (GATT 1994) and Agreement on Safeguards (AoS)."

Further, it said that since the U.S. did not hold mandatory consultations under Article 12.3 of the AoS, India had the right to retaliate.

It added that "India reserves the right to suspend concessions or other obligations... that are substantially equivalent to the adverse effects of the measure to India's trade".

India further said that its proposed measures would be in the form of a suspension of concessions or other obligations on selected products originating in the U.S., which would in effect result in an increase in tariffs on these items.

"India reserves its right to suspend concessions or other obligations after the expiration of thirty days from the date of this notification (May 9, 2025)," it added.

The communication further said that the U.S. measures would affect $7.6 billion worth of imports into the U.S. from India, on which the duty collection would be $1.91 billion.

"Accordingly, India's proposed suspension of concessions would result in an equivalent amount of duty collected from products originating in the U.S.," it added.

India said it would inform both the Council for Trade in Goods and the Committee on Safeguards of the WTO on "the next appropriate steps".

Not the first time

If India does go ahead with its retaliatory measures, it would not be the first time. In June 2019, India imposed higher tariffs on 28 products from the U.S. after the U.S. removed India from its Generalised System of Preferences (GSP) and refused to discontinue its 2018 steel and aluminium tariffs.

The duties – covering $240 million in trade value – were withdrawn in September 2023, after Prime Minister Narendra Modi's state visit to Washington.

Key Issues & Dimensions:

1. India-U.S. Trade Tensions:

- The U.S. initially imposed tariffs in 2018 during Donald Trump's first term.
- The move was intensified in March 2025 by removing product and country-specific exemptions.
- India had sought bilateral talks in April 2025, which were declined by the U.S.

2. India's Stand at the WTO:

- India termed the U.S. tariffs as "safeguard measures in disguise", not national security.
- It claimed a violation of WTO rules under:
- GATT 1994
- Agreement on Safeguards (AoS) – particularly Article 12.3 (consultation clause)
- As a result, India has asserted its right to suspend concessions, i.e., impose reciprocal tariffs.

3. Economic Impact:

- The U.S. tariffs affected Indian exports worth $7.6 billion.
- India aims to collect an equivalent $1.91 billion in retaliatory tariffs on selected U.S. imports.
- India will inform WTO's Council for Trade in Goods and Committee on Safeguards of the next steps.

Mains Relevance & Analysis:

- **Multilateralism vs. Protectionism:**
  - The case exemplifies increasing unilateralism by developed countries under the guise of "national security".
  - India's step to approach WTO reflects its commitment to multilateral trade rules and institutional resolution mechanisms.
- **National Security Exception – A Grey Zone in WTO:**
  - U.S. invoked Article XXI of GATT (security exception), which is self-judging but controversial.
  - India challenges this, stating it's not a legitimate basis to impose broad-based tariffs.
  - Highlights a major gap in WTO's dispute settlement jurisprudence.
- **India's Use of Retaliatory Rights:**
  - Under WTO, members can suspend concessions if affected unfairly.
  - India is using the legal remedy route, showing maturity and strategic assertion in global trade governance.
- **Strain on Bilateral Trade Relations:**
  - Comes at a time when India-U.S. are negotiating broader trade frameworks.
  - Reflects the fragility of economic diplomacy when national interests and political optics override cooperation.

Conclusion :

- India's decision to notify retaliatory tariffs under WTO mechanisms highlights its resolve to protect national trade interests within a multilateral framework. At a time of rising protectionism, India has asserted the importance of rule-based global trade. However, such trade frictions with the U.S. also underline the need for a stable and mutually respectful economic dialogue to prevent escalation and safeguard long-term strategic partnership goals.

UPSC MainsPractice Question

Ques : India's use of the WTO's retaliatory mechanisms in response to U.S. tariffs reflects both economic assertiveness and a commitment to multilateralism. In this context, discuss the implications of invoking safeguard provisions under international trade law and its impact on India-U.S. relations.

This editorial revisits the idea popularised by environmentalist Sunderlal Bahuguna: "Ecology is the permanent economy." It argues that ecological well-being is not separate from, but foundational to, economic and human survival. The piece blends scientific, historical, ethical, and emotional perspectives to argue that sustainability must stem from an internal transformation in our values and lifestyle.

Ecology is the world's permanent economy

The phrase, "Ecology is the permanent economy", made popular by environmentalist Sunderlal Bahuguna, is much more than a slogan. It is a profound reminder of the foundational truth that human prosperity is inextricably linked to ecological health. It is true that economic development without exploiting natural resources and economic stability without conserving them are impossible. As we face serious challenges such as climate change and the rapid loss of biodiversity, we must ask ourselves whether we have truly understood and embraced this idea.

Striking the right balance

Understanding nature's complexity is at the heart of science. In this pursuit, humans have made tremendous efforts through observation, experimentation, and modelling, as this understanding is crucial for addressing environmental challenges such as climate change and for informing sustainable practices. While these scientific discussions are valuable, there is an even more urgent and fundamental truth we need to focus on: ecology is the real economy – our survival, security and progress depend on it. In simple terms, this might be the clearest way to define sustainability – finding the right balance between protecting the environment and supporting economic development. Without this balance, neither the environment nor the economy can thrive in the long run.

Despite being part of the animal kingdom, human evolution, through the course of civilisation, has led to a growing disconnection from nature. This disconnection with nature has been identified as a reason for the ongoing biodiversity loss (the recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services or IPBES Transformative Change report).

In the early stages of human history, a nomadic lifestyle compelled individuals to rely on and exploit natural resources solely for their basic, day-to-day survival needs. Over time, this individual-centric resource use evolved into collective consumption aimed at meeting the needs of growing communities. As human societies expanded and organised themselves into nations, this demand scaled further to cater to the needs of entire countries. Eventually, this progression gave rise to global competition, where nations began to exploit nature not only to satisfy present demands but also to secure resources for future development. Unlike humans, no other species in the animal kingdom exhibits this pattern of large-scale, anticipatory exploitation of natural resources. Other animals live in harmony with their environments, taking only what they need for immediate survival, without disturbing the long-term balance of the ecosystems they inhabit.

P. Ragavan

is a scientist with an interest in taxonomy, ecology and the biogeochemistry of mangroves and seagrasses. He is working on the conservation and management of mangroves and carbon dynamics in the blue carbon habitats of India

Acknowledging this principle will lead to a focus on ecological health as the basis for human survival, economic stability and climate resilience

New complications

The ever-intensifying cycle of human consumption and global competition has placed an unprecedented strain on the planet's ecosystems and significantly accelerated the pace of climate change – a natural phenomenon now dangerously amplified by human activities. In response to these growing environmental challenges, nature-based solutions have been widely advocated in global conservation efforts. These approaches aim to leverage the inherent resilience of ecosystems to mitigate climate impacts, restore biodiversity, and support sustainable development. However, a paradox emerges: we continue to exploit nature to satisfy our needs and greed, while simultaneously relying on the same natural systems to act as a buffer against the consequences of such exploitation. This dual dependence risks creating deeper ecological imbalances and may further complicate the ability to address the climate crisis effectively.

In this context, rather than merely attempting to understand the intricate complexity of ecological systems from a scientific standpoint, it is far more critical to recognise a fundamental truth – that ecology is the permanent economy. Acknowledging this principle shifts our perspective from short-term exploitation to long-term stewardship, positioning ecological health not as a constraint, but as the very foundation of human survival, economic stability, and climate resilience.

This realisation is not just timely – it is essential to confronting the ongoing environmental crisis and shaping a sustainable future. It is only through this reframing that humanity can move from reactive conservation to proactive planetary sustainability. The climate crisis is not just a scientific challenge. It is a moral and existential reckoning with the ecological foundations of our existence.

The need to reconnect with nature

Climate change and change in distribution patterns of biological diversity are not new for planet earth. However, the rate at which it is now occurring is detrimental to the planet's biological diversity, including people, due to past unsustainable developmental activities by humans. Therefore, the change we need must come from within.

Since all developmental activities across the globe are aimed at fulfilling human needs, adopting a sustainable lifestyle is every individual's responsibility in order to ensure the success of global sustainability initiatives. To achieve this, we must realise that humans are an integral part of nature.

Though technological advancements have distanced modern lifestyles from nature, one unique natural trait that humans possess is the power to reconnect with nature using emotion (which still lives within us). Thus, future conservation efforts should be designed to strengthen our emotional bond with nature. To ignite this, a realisation that "ecology is the permanent economy", is more imperative than merely understanding the ecological complexity that exists in nature.

The views expressed are personal

Key Takeaways and Dimensions for Mains Answer Writing:

1. Core Message: Ecology = Economy

- Human prosperity, security, and survival are interlinked with ecological health.
- Economy built on ecological degradation is inherently unsustainable.
- Sustainability, thus, is not a balancing act between two opposing goals but a holistic vision that includes ecology at its core.

2. Historical Progression of Human-Nature Relationship

- Early humans: used resources for survival.
- Organised societies: collective and planned exploitation.
- Modern globalised world: anticipatory exploitation—a behavior no other species exhibits.
- This shift has led to an unsustainable consumption pattern and climate destabilisation.

3. Current Challenges

- Accelerated climate change due to intensified human activity.
- Dual paradox: humans depend on ecosystems for survival but continue to degrade them for consumption.
- Nature-based solutions (NbS) are being pursued globally (e.g., mangrove conservation, blue carbon), but with continued exploitation, they are insufficient unless backed by deeper transformation.

4. Call for Ethical & Emotional Transformation

- The crisis is not just environmental but moral — an existential reckoning.
- Science alone is not enough; emotion, empathy, and ethics are crucial.
- Humans have the unique ability to emotionally reconnect with nature — this should be the basis of conservation strategies.

5. Policy and Governance Implications

- Development planning must internalise ecological constraints.
- Climate policies should promote lifestyle change (e.g., LiFE mission – Lifestyle for Environment).
- Promote emotional ecological education—conservation as a value, not a regulation.

Conclusion:

- Reimagining ecology as the true economy shifts the lens from short-term growth to long-term survival. Only by recognising this truth can humanity pursue a path of development that is equitable, ethical, and ecologically secure.

UPSC MainsPractice Question

Ques: Ecology is the permanent economy." In light of this statement, critically examine the need to realign development and conservation in the context of the ongoing environmental crisis.

Page 08 : GS 2 : International Relations

The recent trade agreement between the U.S. and China, involving a temporary reduction in tariffs, signals a thaw in the long-standing trade war. While global markets have reacted positively, the deal raises both opportunities and challenges for India, especially in the context of its trade policy, manufacturing ambitions, and geopolitical positioning.

Key Highlights of the Deal:

- U.S. Tariffs on Chinese goods reduced from 145% to 30% for 90 days.
- China's tariffs on U.S. goods reduced from 125% to 10%.
- Markets surged globally (2%-3.8%) on the news.
- Ongoing negotiations to address deeper issues like the U.S. trade deficit with China.

Implications for India :

1. Shift in Investor Sentiment & Manufacturing Outlook

- A successful U.S.-China rapprochement may drive investors and manufacturers back to China, due to its cost-efficiency and scale advantages.
- India's opportunity under the "China+1" strategy may weaken unless it makes urgent reforms to remain competitive.

2. Impact on India's Trade Diplomacy with the U.S.

- India is negotiating a trade deal with the U.S., while simultaneously retaliating against U.S. tariffs on Indian steel and aluminium.
- This parallel negotiation-retaliation approach reflects tensions and trust deficits in India-U.S. trade relations.

Big deal

The U.S.-China trade deal will have implications for India

The trade agreement between the U.S. and China, the two biggest economies in the world, serves as a breather in an otherwise tense global trade environment. The U.S. has agreed to temporarily lower, for 90 days, its overall tariffs on Chinese goods from 145% to 30%, while China will cut its tariffs on American imports from 125% to 10%. Markets across the world cheered the announcement, jumping between 2%-3.8% following the news. The thaw comes on the back of tensions and tariffs being ratcheted up by both sides, starting with U.S. President Donald Trump's February 1 announcement of a varying tariff on imports from China, Mexico and Canada. Notably, he excluded China from the 90-day pause on 'reciprocal' tariffs announced in early April. One way to look at this latest development is that it shows Mr. Trump is backing down from his tariff war-footing, acknowledging the importance of China to the U.S. economy. Indeed, the joint statement by both countries begins by mentioning "the importance of their bilateral economic and trade relationship". However, another view is that his heavy-handed approach has succeeded in convincing China to come to the negotiation table. Tariffs of 145% were unsustainable but served their purpose. The fact also is that Mr. Trump's main grievance, of a ballooning trade deficit with China, remains unaddressed. The two sides have agreed to continue talks, which will be key in determining whether this seemingly intractable problem can be worked around or result in tensions again.

For India, this brings both uncertainties and certainties. If further talks between the U.S. and China are successful, investors who have moved to other countries will likely start viewing China favourably again. The advantages of manufacturing there – scale and costs – are still significant. The China+1 model, which India in any case has not been able to leverage adequately, might start to lose its sheen. The other uncertainty is around India's own trade talks with the U.S. It has now informed the World Trade Organisation of potential reciprocal measures to the U.S.'s increased duties on steel and aluminium imports. Even though talks on a U.S.-India trade deal are ongoing, this latest statement shows that tensions remain high. The certainties are two-fold. The first is that India's trade deficit with China remains vast and rising, and the U.S.-China agreement will not reduce this. 'Make in India' is currently inextricably linked to 'Import from China'. The second certainty carries over from the first. The Centre must lean heavily on States to adopt labour and land reforms that can allow scalable manufacturing to become cost-effective here. Without this, India will remain dependent on Chinese imports, regardless of its dealings with the rest of the world.

3. Persistent Trade Deficit with China

- India's trade deficit with China remains large and growing.
- Despite the "Make in India" initiative, there is deep reliance on Chinese imports, especially in electronics, machinery, and APIs (pharmaceuticals).

4. Structural Reforms Needed for Scalable Manufacturing

- Without land and labour reforms at the state level, India cannot attract global manufacturing at scale.
- The editorial rightly argues: "Make in India" is inextricably linked to "Import from China" — unless competitiveness is built from within.

Broader Issues for Mains Discussion:

- **A. Geopolitical Strategy:**
  - India needs to balance between competing power blocs without appearing to align with either.
  - Trade policies must be integrated with strategic concerns in the Indo-Pacific and QUAD frameworks.
- **Trade Diversification & Resilience:**
  - India must deepen trade ties with ASEAN, EU, and African nations.
  - Focus on FTAs (e.g., with UAE, Australia, EU under discussion) and supply chain resilience initiatives (e.g., with Japan, Australia).
- In**stitutional Readiness:**
  - The Centre must work closely with States for regulatory simplification, logistics infrastructure, and ease of doing business to attract investment.

Way Forward:

- Accelerate factor market reforms (land, labour).
- Promote R&D-led indigenous manufacturing.
- Strengthen alternative trade partnerships and regional supply chains.
- Negotiate balanced and fair trade pacts with transparency and domestic preparedness.

Conclusion:

- The U.S.-China deal is a reminder that global economic equations are dynamic. India's trade and manufacturing policies must become proactive and reform-oriented to turn global shifts into domestic opportunity.

UPSC MainsPractice Question

Ques : • The U.S.-China trade agreement offers a momentary relief in global trade tensions but also poses long-term implications for India's trade strategy and manufacturing competitiveness. Discuss.

Page 09: GS 3: Indian Economy

The tragic suicide of Kailash Arjun Nagare, a nationally awarded young farmer from Maharashtra, has drawn attention to India's deep-rooted irrigation inequities and unsustainable water management practices. Despite India's status as the largest consumer of water in agriculture, access to irrigation remains inequitable, inefficient, and unsustainable, exacerbating both economic and environmental distress.

A death that spotlights irrigation problems

Lisa Mariam Varkey

Senior specialist, Socio-Economics, International Rice Research Institute

On March 13, 2025, Kailash Arjun Nagare, a 2020 Young Farmer Award recipient, from Maharashtra, died by suicide, citing unaddressed irrigation demands. While India reports the highest water usage in agriculture globally, access to water for irrigation remains a contentious issue. Nagare's death points towards the inequity in distribution, with social inequalities, water governance mechanisms, and policies determining the contours of allocation. The problem of water scarcity in India is thus multifaceted, indicating the co-existence of actual physical shortage with economic scarcity due to inequitable access and management.

Untenable expansion

The agricultural sector accounts for almost 80% of the water withdrawal in India. Every year, 688 billion cubic metres of water is consumed by the farm sector, the highest in the world. Irrigation is an inevitable input for increasing agricultural production. However, its expansion has been highly untenable. The majority of the area under water-guzzling crops such as rice, wheat, and sugarcane is currently in the water-scarce north-west and sub-tropical belts of the country. According to a study published in Nature Water (2024), India alone accounted for 36% of global unsustainable irrigation expansion that happened between 2000 and 2015, with environmental and socio-economic implications.

Even as irrigation has been proven to drive economic prosperity, various studies have reported that uneven progress has reinforced existing inequalities, between and within States. Considering that ground water is the dominant water source for irrigation in India, property rights, energy pricing policy, and the existence of well-functioning water markets have remained critical in determining water access to farms. Accordingly, while inequity has declined in canal, tank, and well irrigated systems, it has increased in the tube well irrigated system. Marginalised groups, especially women, are also disproportionately affected by increasing deprivation and decline of water tables with climate change intensifying disparities.

The environmental and financial consequences of aggressive groundwater extraction have also been profound. Due to over extraction, almost 17% of India's groundwater assessment units are deemed 'over-exploited' while 3.9% are in a 'critical' state. Intensive pumping has also resulted in massive energy consumption resulting in excessive carbon emissions. As per the latest data, 45.3–62.3 MMT of annual carbon emissions is attributed to groundwater irrigation, which constitutes 8-11% of India's total carbon emissions.

The operating efficiency and water use efficiency has also remained sub-optimal in Indian agriculture. While irrigation systems in India report an operating efficiency of 38%, in developed countries it is 55%. Coupled with misaligned cropping patterns and inefficient water use practices, irrigation water productivity (IWP) has also remained low in the major irrigation belts of the country. For example, Punjab, which claims the highest land productivity in rice, has one of the lowest IWPs for the crop. Similarly, in sugar cane, Tamil Nadu records the highest land productivity with IWP being dismally low. Besides water wastage, the adoption of non-optimal water management practices have been causing other negative externalities such as high GHG emissions as well. For example, with continuous flooding of rice as the major water management practice, paddy rice is the biggest contributor to global cropland emissions.

Considering the over-exploitation of ground water resources, impending water scarcity and environmental externalities, further attempts to improve the irrigation system of the country should be built on efficient water-saving technologies, improved irrigation efficiency, and alternative sources of irrigation.

The way forward

While change in cropping patterns and ground water usage regulations through policy decisions should also be aimed at in the medium and long term, advancing irrigation technologies and practices based on sustainable intensification should be prioritised. Better irrigation efficiency may be aimed through the improvement of conveyance and application efficiency of irrigation systems. In geographies where water withdrawals and GHG emissions have been highest, alternative water management technologies such as alternate wetting and drying, which can result in significant water saving and reduced emissions, may be popularised. Similarly, micro-irrigation systems such as drip irrigation, with minimal application losses, may be popularised in crops such as sugar cane. Promoting solar-powered irrigation and/or bundling solar pumps with micro-irrigation systems is another promising option. However, with the marginal cost of pumping being zero, this should not result in increased groundwater depletion and should be regulated through initiatives such as assured grid connection offering economic incentives for efficient utilisation. Rain water harvesting structures and tail water storage pits may be popularised as supplementary irrigation sources. Since traditional supply-based mechanisms do not necessarily promote equitable distribution of irrigation water, initiating demand-driven allocation systems run by participatory irrigation management structures should be widely promoted.

It is imperative that India strengthens its knowledge, regulations, policies and programme to rationalise the use of its limited water resources

Key Issues Highlighted:

1. Irrigation Inequity and Social Injustice

- India faces economic scarcity of water due to unequal access, even where physical water may be available.
- Groundwater irrigation systems (e.g., tube wells) have worsened inequality.
- Marginalised groups, especially women, bear the brunt of water shortages and climate change impacts.

2. Unsustainable Expansion of Irrigation

- India consumes 688 BCM water annually in agriculture — highest globally.
- Over 36% of global unsustainable irrigation expansion (2000–2015) happened in India.
- Misplaced emphasis on water-intensive crops (rice, wheat, sugarcane) in water-stressed areas like Punjab and Maharashtra.

3. Environmental & Energy Costs

- Over-extraction of groundwater has led to:
- 17% units 'over-exploited'
- 3.9% in 'critical' condition
- Groundwater irrigation contributes to 8–11% of India's total CO_2 emissions (45–62 million tonnes).
- Irrigation efficiency in India is only 38%, far below global standards (~55%).

4. Low Irrigation Water Productivity (IWP)

- High land productivity ≠ efficient water use.
- Punjab (rice) and Tamil Nadu (sugarcane) have low IWP despite high crop output.
- Continuous flooding of rice fields makes it a top contributor to global GHG emissions from croplands.

Way Forward (Recommendations):

- **Policy & Regulatory Measures**
  - Rationalise cropping patterns based on agro-climatic zones.
  - Regulate groundwater through pricing, metering, and incentivisation.
  - Reform land and water rights to improve equitable access.

- **Technological Interventions**
  - Promote Alternate Wetting and Drying (AWD) in paddy.
  - Expand micro-irrigation (drip/sprinkler), especially in sugarcane and horticulture.
  - Encourage solar-powered irrigation, bundled with efficient usage incentives.
- **Participatory and Localised Water Governance**
  - Shift from supply-based to demand-driven systems.
  - Scale up Participatory Irrigation Management (PIM) and water user associations.
  - Construct rainwater harvesting structures and tail-water storage pits for supplemental irrigation.

Conclusion:

- Farmer suicides like that of Kailash Nagare are not isolated tragedies but symptoms of structural failures in water governance. Sustainable, equitable, and technology-led irrigation reform is not a choice — it is an agricultural necessity and a moral obligation..

UPSC Mains Practice Question

Ques: Discuss the environmental impact of the global shipping industry and evaluate the feasibility of the IMO's proposed Market-Based Mechanism to reduce emissions. **(150 Words)**

In India, education without employment

Gautam R. Desiraju

is Professor Emeritus, Indian Institute of Science and Distinguished Professor, UPES Dehradun, with a citations-to-publications ratio of 102.5

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In defending the educational policies of the present government, it has been claimed that education has been freed from the shackles of previous governments: Atal Tinkering Labs, coding right from middle school, the recruitment of Scheduled Caste/Scheduled Tribe teachers, and the empowerment of Muslim girl students. But primarily, it is stated that the National Education Policy (NEP) 2020 "will enable an educational renaissance".

In all these utterances, the seminal point that is forgotten is that our educational system remains clueless about the shape-shifting marketplace – namely, the employability of our graduates as a workforce.

Education has many purposes. It enables, it enervates and elevates. As Vivekananda said, education empowers one to stand on one's own feet. After 75 years of foolishly gambling excellence for equity, India has squandered both. Young people are unable to find meaningful employment that is commensurate with any training that they may have received. The degrees they have are not worth the paper on which they are printed.

It is irrelevant that these problems were created or ignored by the Congress pot or the Bharatiya Janata Party kettle. The present lawfully elected government has the responsibility to cleanse these Augean stables. Never mind that the NEP 2000 is the fourth such document that was supposed to do this after the Radhakrishnan Commission (1948); the Kothari Commission (1966) and the Officers' Commission (1985).

A good education is one with an optimum of depth and breadth. Depth alone imparts the technical expertise for employability. Breadth provides flexibility in a rapidly changing Artificial Intelligence-driven ecosystem, where those in the job market need to constantly re-train themselves to avoid extinction.

A high rate of educated unemployment

There is barely any evidence, four years on, that any of the NEP recommendations have been put into effect. In 2025, India's overall graduate employability rate is 42.6%, which is practically the same as the 44.3% of 2023. Similarly, knowledge-intensive employment in the year 2023 only stands at 11.72%. Multiple entries and exits, a hallmark of NEP, have only created low-quality and poorly paying e-commerce jobs.

The high rate of educated unemployment today shows that education in India is actually disempowering students. The NEP is a retreat to the Vannevar Bush model of the mid-20th century U.S. without its financial cushioning. The NEP is outdated and financially unviable in the India of 2025. With lip service paid to 'new' ideas such as Indian Knowledge Systems (IKS), mother tongue learning, changing history textbooks, flexible curricula and a complete absence of methodology to effect its recommendations, the NEP is a dead fish in the water. It depends on course choice alone to correct imbalances, notwithstanding that the course content itself may be unworkable. It is noteworthy that there was not a single member from industry or the business sectors in the committee that drafted the NEP.

The educational system is clueless about the employability of India's graduates as a workforce

A good university seamlessly integrates breadth with depth. It is claimed that there has been a remarkable improvement from the past in that 11 Indian universities are ranked in the top QS World University Rankings (WUR) 500, clearly echoing the selective narrative of Nunzio Quacquarelli, CEO of QS, who was generous in his praise of India, while releasing WUR 25. Mr. Quacquarelli quoted the 318% increase in the performance of Indian universities, as the highest growth among the G-20 nations, quietly avoiding mention of both India's low ranking (above 100) and low publication quality. To wit, India's Category Normalized Citation Impact (CNCI) rank (an indicator of publications quality) during 2008-19 which was 17th among 19 countries in the G-20, inched up admirably to 16th position in 2024. Such 'increases' have been touted by the Ministry in its Press Information Bureau press release of February 13, 2025. It has also been claimed that this is the year when Indian universities showcased the highest performance improvement among all G-20 nations. It is unbelievable that in this digital era, the government has failed to recognise and understand the commercial implications of QS, THE and similar agencies and the reasons for their skewed and deceptive analyses.

A missing transparency on projects

Mega research projects were carried out with great fanfare and amidst a media blitz in the past. These included the New Millennium project (CSIR-NMITLI), the $10 Akash tablet project, and the IMPRINT (IMPacting Research INnovation and Technology) project (MHRD).

These projects were in the limelight for years, but the public is not aware of the emergence of the intended products or processes from these projects, on which hundreds of crores of taxpayer money has been spent. It does not matter whether these projects were initiated or shut down by the Congress or the BJP. What we, as taxpayers, want to know is if these projects were value for money.

India's Global Innovation Index (GII) represents the innovation capabilities of India. Our ranks in 2014, 2015 and 2024 were 76, 81, and 39. Malaysia and Türkiye lead India in GII with ranks of 33 and 37, respectively. The GII reveals the world's top S&T clusters in two innovation metrics: published patent applications and published scientific articles. India has four clusters with ranks of 56 (Bengaluru), 63 (Delhi), 82 (Chennai) and 84 (Mumbai). The Bengaluru cluster is often touted as an unparalleled rival to Silicon Valley, particularly with respect to the numbers of startups and Unicorns. However, its 56th rank needs to be compared to the sixth-ranked Silicon Valley cluster. In terms of cluster intensity of the top 100, Bengaluru at 94 followed by Chennai at 96, Delhi at 98, and Mumbai at 99 pale in comparison to San Jose-San Francisco (Silicon Valley) at 2 and Cambridge at 1. The number of Patent Cooperation Treaty (PCT) applications per capita and scientific publications per capita for the Silicon Valley cluster are 7885 and 9211, respectively. The corresponding numbers for the Bengaluru cluster are 313 and 1077. Samsung Electronics (South Korean) is the leading patentee in Bengaluru. No further comment is necessary.

The subject of start-ups

There is no point talking about start-ups, when we do not know what they mean. Start-ups in China, the U.S. and Israel tackle semiconductor technology, how to refine rare earth elements with ecological sensitivity and how to make metformin cheaper. In contrast, our government lauds new apps that hawk food products. India cannot have start-ups without indigenous technology. It cannot have indigenous technology without indigenous science. It cannot have indigenous science without indigenous quality education, sans political agendas. Two-wheeler *kiranas* are not startups.

Contrary to the thinking of the Education Ministry, the University Grants Commission (UGC) remains an instrument of control. It always has been and there is no justification for this antediluvian organisation to have both regulatory and financial control over universities. Can the UGC present a single piece of hard data showing that changes in pedagogy and syllabus have had a positive effect? In other words, how relevant are these changes, if any, to industry, skilling, and employability? India would probably be better off if the UGC was shut down. Sitting UGC chairs, vice-chancellors, directors and ministers need not appear in national dailies peddling their policies and propaganda ad nauseam. Their job is to execute policy, not talk about it, and to ensure decent employability for the youth. It is our job, as independent academics, to write in the newspapers, if they do not do their job.

"When stupidity is considered patriotism, it is unsafe to be intelligent" – Isaac Asimov

The views expressed are personal

Paper 02:Social justice

UPSC Mains Practice Question:India's education system is producing degrees, not employable graduates." Critically examine the gaps in implementation of the National Education Policy (NEP) 2020 and suggest reforms to bridge the education-employment divide.(250 words)

Context :

- The editorial is a critique of India's education-employment disconnect, pointing out systemic flaws in the National Education Policy (NEP) 2020, poor implementation, misaligned curriculum, and weak linkages between education, research, and industry. It warns against celebrating superficial achievements while ignoring core problems like employability, innovation output, and quality education.

Key Issues Raised:

1. Employability Crisis

- Graduate employability in 2025: Only 42.6% — virtually unchanged since 2023.
- Knowledge-intensive employment remains low at 11.72%.
- Degrees are often irrelevant or outdated, lacking practical value or industry alignment.

2. NEP 2020: Vision vs Reality

- Policy goals such as flexible curricula, multiple exits, Indian Knowledge Systems, etc., are poorly implemented or superficial.
- No concrete methodology or funding mechanisms to implement these goals.
- NEP lacks industry consultation — a critical failure in a market-driven job landscape.

3. Research, Rankings & Reality Check

- Government touts rising QS rankings, yet India's CNCI rank (research quality) is still poor (16th out of 19 in G-20).
- Publication and patent output is weak compared to global clusters.
- Many mega research projects (Akash tablet, IMPRINT) saw no visible outcomes or accountability.

4. Start-up Hype vs Real Innovation

- Indian start-ups celebrated for app-based models (e.g., food delivery), whereas global start-ups work on deep tech, semiconductors, pharmaceuticals.

- Without indigenous science, there can be no indigenous innovation.
- Start-up culture must be rooted in home-grown R&D and quality education.

5. Regulatory Bottlenecks – UGC

- UGC holds both regulatory and financial powers, which stifles academic freedom.
- There's no data-driven evaluation of whether curriculum reforms have improved industry relevance or student outcomes.
- The writer calls for a complete overhaul or abolishment of the UGC.

Key Analysis :

- **Education-Employment Mismatch**
  - Challenges the traditional idea that more degrees = better jobs.
  - Links curriculum planning and skill development to employability and national productivity.
- **Flawed Metrics & Institutional Tokenism**
  - Global rankings often mislead by emphasizing quantity over quality.
  - India needs focus on knowledge depth, research ethics, and academic-industry collaboration.
- **Policy Implementation Deficit**
  - NEP 2020 suffers from a lack of:
    - Budgetary support
    - Institutional coordination
    - Ground-level execution
    - Science-Technology-Innovation Ecosystem
- **Innovation cannot thrive without:**
  - Indigenous research
  - Practical skilling
  - Transparent funding in universities

Conclusion:

- The true success of educational reforms lies not in rankings or slogans, but in preparing youth for meaningful work. India's demographic dividend will turn into a disaster if education continues to remain disconnected from the demands of the real economy.