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Edition: International Table of Contents

Page 01: Prelims Fact

Kannada author Banu Mushtaq, along with translator Deepa Bhasthi, has won the International Booker Prize 2025 for the short story collection Heart Lamp. This marks a historic first for Kannada literature and the first time a short story collection has been honoured by the prize.

Heart Lamp burns bright, wins the Booker Prize for Banu and Deepa

The Hindu Bureau
KOLKATA

Kannada writer, lawyer, and activist Banu Mushtaq, 77, began writing about her people, their joys, sorrows and anxieties, over five decades ago.

On Tuesday, *Heart Lamp*, a collection of 12 short stories selected from her work written between 1990 and 2023 and translated by Deepa Bhasthi, won the International Booker Prize for 2025 from a shortlist featuring books in French, Italian, Danish, and Japanese.

It's a first win for Kannada, and the first time in the history of the prize that a collection of short stories has been honoured.

The award for an Indian writer comes three years after Geetanjali Shree won the prestigious literary prize for *Tomb of Sand*, translated from Hindi by Daisy Rockwell.

Ms. Mushtaq, who hails from Hassan in Karnataka, uses a language that "sings of resilience and nuance" to narrate the everyday lives of Muslim women, moved by their lived experiences of pain and suffering in a patriarchal society.

Equally compelling is Ms. Bhasthi's "radical translation", which moved the Booker Jury Chair Max Porter to remark that it "ruffles language to create new textures in a plurality of Englishes".

In her translator's note, Ms. Bhasthi says that Ms. Mushtaq's career can be summed up in one Kannada word - '*bandaya*', which means "dissent, rebellion, protest, resistance to authority, revolution and its adjacent ideas." The Bandaya Sahitya literary movement of the 1970s and 1980s, which urged marginalised communities including women and Dalits to tell their stories and fight for their rights, helped Ms. Mushtaq find her voice.

Faced backlashes

Narrating unheard stories and speaking truth to power have had consequences. Just 20-odd years ago, Ms. Mushtaq faced a severe backlash for saying that women too have a right to offer prayers in mosques.

Ms. Mushtaq writes about girls like "sweet Asifa" who has had to bid goodbye to her studies to look after her siblings and help her mother (*Stone Slabs for Shaista Mahal*); or overworked mothers like Arifa (*Fire Rain*) and Mehrun (*Heart Lamp*) who struggle to save their children and themselves; and maulvis who would rather preach than practise (*Black Cobras*). In another story, the narrator, weary after giving birth, pleads to god: 'Be a Woman Once, Oh Lord!'

Tales of nuance: Banu Mushtaq, right, and Deepa Bhasthi with the International Booker Prize, 2025 in London. GETTY IMAGES

With her ear to the ground, the 77-year-old Ms. Mushtaq reflects on the myriad struggles of a woman's life, particularly her lack of choice about her rights. Their circumstances may differ, but women all across the world have faced discrimination in some form, and are unfortunately familiar with inequality and oppression.

'A thousand fireflies'

In her eloquent acceptance speech, Ms. Mushtaq said the prize is an "affirmation that we as individuals and as a global community can thrive when we embrace diversity, celebrate our differences and uplift one another." Together, she said, "we can create a world where every voice is heard, every story matters, and every person belongs." In a world that often tries to divide people, Ms. Mushtaq contended that literature remains one of the "last sacred spaces where we can live inside each other's minds if only for a few pages."

Borrowing a phrase from her "own culture", Ms. Mushtaq likened the Booker-winning moment to a thousand fireflies lighting up a single sky - brief, brilliant and utterly collective. Both Ms. Mushtaq and Ms. Bhasthi hope that the Booker honour will light the way for more translations across barriers.

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Key Highlights for UPSC Prelims:

- **Banu Mushtaq:**
  - 77-year-old Kannada writer, lawyer, and activist from Hassan, Karnataka.
  - Associated with the Bandaya Sahitya Movement which promoted literature of dissent and resistance, particularly from marginalized voices including Dalits and women.
  - Her work focuses on the lived experiences of Muslim women in patriarchal setups.
- **Deepa Bhasthi:**
  - Translator of Heart Lamp into English.
  - Known for her "radical translation" style that adapts linguistic textures to express cultural plurality.
- **Heart Lamp:**
  - A collection of 12 short stories written between 1990 and 2023.
  - Explores themes of female agency, societal oppression, and religious patriarchy.
  - First Kannada work to win the International Booker Prize.
  - First short story collection to be awarded in the prize's history.

- **International Booker Prize:**
  - Awarded annually for a work of fiction translated into English and published in the UK or Ireland.
  - Recognizes both author and translator (shared prize).
  - Different from the original Booker Prize which is for novels written in English.
- **Cultural & Social Significance:**
  - Encourages regional literature and the importance of translation.
  - Highlights intersectionality in feminist literature—religion, caste, and gender.
  - Promotes literary diplomacy by showcasing India's soft power.
- **Past Indian Win:**
  - In 2022, Geetanjali Shree won the International Booker Prize for Tomb of Sand, translated from Hindi by Daisy Rockwell.

UPSC PrelimsPractice Question

Ques : Which of the following languages won the International Booker Prize for the first time in 2025?

a) Hindi

b) Kannada

c) Tamil

d) Bengali

Ans : b)

Page 07: GS 3 :Environment

Recent research from ETH Zurich and collaborators has revealed alarming projections on the intensifying and shifting patterns of tropical cyclones under various climate change scenarios, especially SSP5-8.5. These findings underscore how warming will not only make cyclones more intense but also expose new, unprepared regions and fragile ecosystems like mangroves to greater risk.

Warming likely to make cyclones more destructive than ever before

Climate models indicate that tropical cyclone belts could begin shifting poleward, exposing ecosystems in the higher latitudes to threats to which they have not adapted. They also suggest that in the SSP3-7.0 emissions scenario, 97% of mangroves in Southeast Asia could be highly threatened

Madhurima Pattanayak

Cyclones are among the earth's most powerful storms. Like forest fires and lightning strikes, they are natural – yet their effects are becoming more destructive thanks to climate change.

In a new study published by researchers at ETH Zurich in Switzerland, the world's cyclones can be expected to wreak more havoc in new ways if global warming follows a future climate scenario called SSP5-8.5.

This is both due to the cyclones' intensity and their occurring in places where they didn't occur before.

Climate change has many moving parts. To make sense of its impact on various sectors and ecosystems, experts often use the shared socioeconomic pathways (SSPs). Each SSP describes a world affected in a particular way by climate change. SSP3 describes a politically fragmented world in which environmental protection is not a priority. The SSP5 world is rapidly burning fossil fuels and depleting a great amount of resources.

SSP5-8.5 is the SSP5 pathway plus a radiative forcing – the amount of extra energy being added to the planet's surface – of 8.5 W/m². Currently, this figure is 2.7 W/m² over the value in 1750. (A radiative forcing of 2.6 W/m² is required to keep global warming by 2100 under 2° C, as suggested by the Paris Agreement.)

"Based on the data, SSP5 is already gaining momentum," said Chahan Kropf, a scientist specialising in weather and climate risk studies at ETH Zürich and a coauthor of both studies. "But we still need broader agreement on that."

A follow-up study published by the same team plus two more researchers also reported that roughly half of the world's mangroves will be at high to severe risk by 2100. Coastal ecosystems protect inland areas from storms, reduce soil erosion, and store carbon. Mangroves in particular can also store four- to five-times more carbon per unit area than terrestrial forests.

The two studies show the effects of climate change on tropical cyclones could have far-reaching and multifaceted consequences around the world, not just in the tropics.

Waves driven by Cyclone Fengal strike the coast at Kasimedu fishing harbour in Chennai. B. JOTHI RAMALINGAM

Cyclones in an SSP5-8.5 world

In the first study, the researchers used the CLIMADA (CLIMate ADAptation) open-source risk modelling platform to check how specific ecoregions around the world responded to shifts in tropical cyclone patterns between 1980 and 2017 and to projected shifts for 2015-2050. They assumed that the world would be in the SSP5-8.5 scenario in the latter period.

For the analysis, the researchers used the STORM-B and STORM-C datasets, which are based on synthetic probabilistic cyclone tracks, and the Holland model to simulate wind fields.

First they classified each terrestrial ecoregion in the following way: resilient (historically often exposed to cyclones and able to recover quickly); dependent (regularly disturbed by cyclones that also shape the area's ecosystem dynamics); and vulnerable (rarely disturbed by cyclones and recovering slowly when exposed to one).

They also grouped the cyclones into three categories based on the intensity of wind speed: low, medium, and high.

For each ecoregion, the researchers estimated the average time between cyclones. Finally, they were able to determine the ecosystem risk under climate change by the projected shifts in these return periods and the corresponding ability – or lack thereof – of ecosystems to recover.

According to Philip Ward, climate researcher at the Institute for Environmental Studies at Vrije Universiteit Amsterdam, "The authors used state-of-the-art data and models to provide valuable insights." He wasn't involved in the study.

Modelling mangroves

In the second study, the team used a probabilistic spatially explicit risk index – a number that simultaneously measures the odds of an event and its expected spatial distribution – to assess how mangroves worldwide will be affected by changes in tropical cyclone frequency and sea-level rise by 2100.

For this, the researchers used a tropical cyclone model based on the most up-to-date climate model data and used it to simulate three scenarios: SSP2-4.5, SSP3-7.0, and SSP5-8.5.

Each of these scenarios quantified three kinds of risk. (i) 'Hazard' modelled the wind speeds and frequencies of tropical cyclones. (ii) Vulnerability modelled the capacity of mangroves to adapt to sea-level rise. (iii) Exposure modelled how much the areas covered with mangroves overlapped with areas of higher hazard.

To this end, the team grouped tropical cyclone wind speeds into three ranges:

According to a new study, the world's cyclones can be expected to wreak more havoc in new ways if global warming follows a future climate scenario called SSP5-8.5

33-49 m/s, 50-70 m/s, and more than 70 m/s. Similarly, they grouped sea-level rise into low (0-4 mm/year), medium (4-7 mm/year), and high (>7 mm/year) ranges.

Mangroves were considered to be at risk if the frequency of intense cyclones doubled or if they were newly exposed to such storms. The team also considered ecosystem services to be at risk – including mangroves' ability to sequester carbon, protect coasts, and improve fish stock – based on rankings from previous studies.

New places, new perils

The models found that of the world's 844 ecoregions, 290 are already affected by tropical cyclones. The models revealed 200 more can be considered vulnerable and 26 to be resilient.

However, in the resilient ecoregions, the models showed that the time available to recover between storms could drop from 19 years in the 1980-2017 period to 12 years in the 2015-2050 period for high-intensity storms.

The bulk of these shifts are expected to occur in East Asia, Central America, and the Caribbean because these places are abundant in resilient or dependent ecoregions. The models also found that Madagascar and parts of Oceania are increasingly at risk.

Some areas, including the Philippines, could experience cyclone frequencies that exceed anything experienced so far in recorded history.

In the SSP5-8.5 scenario, up to 56% of mangrove areas worldwide could be at high to severe risk by 2100. Southeast Asia is expected to be the most affected, with 52-78% of its mangrove areas at such risk.

But the models also showed that even in the less destructive SSP3-7.0 scenario, 97-98% of mangroves that protect people and property in Southeast Asia could be at high to severe risk.

The researchers also warned that some of the affected ecosystems could shift into entirely different states from which they may not recover.

The models also concluded that tropical cyclone belts could shift away from the equator, bringing new cyclone activity to higher-latitude regions and exposing ecosystems there to threats to which they have not adapted.

According to Kropf, whether the world ends up in the SSP5-8.5 scenario hinges on how long it banks on fossil fuels and how committed countries remain to the Paris Agreement.

In the meantime, the authors suggest including long-term recovery time in risk assessments in addition to damage caused by cyclones and risk-sensitive conservation planning, including decision-making processes that explicitly consider shifting disturbance regimes.

"We're underestimating the scale of what's coming," Kropf said. "The changing cyclone patterns could have enormous consequences."

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Key Findings:

- **Climate Change Intensifies Cyclone Risk**
  - Under SSP5-8.5, tropical cyclones are expected to:
  - Become more intense with stronger winds.
  - Occur in new geographical regions (poleward shift of cyclone belts).
  - Shorten recovery periods between storms for ecosystems.
- **Ecosystem Threats and Classification**
  - Researchers categorized 844 global ecoregions as:
  - Resilient (adapted to frequent cyclones),
  - Dependent (ecosystem shaped by cyclones), and
  - Vulnerable (rarely impacted, recover slowly).
  - High-intensity storm intervals may shrink from 19 years to 12 years, straining recovery.
- **Mangroves at Severe Risk**
  - Mangroves store 4–5x more carbon than terrestrial forests and protect coasts.
  - Under SSP5-8.5, up to 56% of global mangroves could be at high to severe risk.
  - Even under moderate SSP3-7.0, 97–98% of Southeast Asia's mangroves could be highly threatened.
- **Cyclones Shifting Toward Higher Latitudes**
  - Cyclone belts may move away from the equator, threatening ecosystems not adapted to high winds.
  - New vulnerable zones may emerge in East Asia, Madagascar, Oceania, and higher-latitude regions.

Scientific Tools Used

- **CLIMADA:** Open-source climate adaptation risk platform.
- **STORM-B and STORM-C:** Synthetic cyclone track datasets.
- **Holland model:** Simulates wind fields.
- **Probabilistic risk index:** For mapping risk to mangroves using cyclone frequency and sea-level rise data.

Conclusion:

- The study serves as a wake-up call that global warming is reshaping the geography and intensity of natural disasters, like cyclones. These findings must guide both national climate policy and local-level adaptation planning, especially in vulnerable ecoregions and coastal zones like India's Sundarbans, Andhra coast, and the Andaman-Nicobar Islands.

UPSC PrelimsPractice Question

Ques: Which tool is used to assess cyclone risk in the ETH Zurich study?

a) GHG Protocol b) CLIMADA c) INDC Analyzer d) Carbon Risk Index

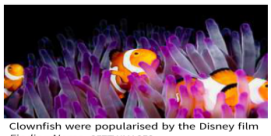
Ans : b)

Page : 07 :GS 3 : Environment

During the 2023–2024 global marine heatwave, about 84% of coral reefs were affected by coral bleaching due to sustained ocean warming. A recent study published in Science Advances offers fascinating insight into how clownfish (Amphiprion percula) adapted to this stress — by shrinking their body size to increase survival chances.

Key Scientific Findings:

- **Study Details:**
  - **Location:** Kimbe Bay, Papua New Guinea
  - **Sample:** 67 wild breeding clownfish pairs observed over 180 days.
  - **Method:** Measured body length monthly; used water temperature sensors to correlate heat stress with physical changes.
- **Clownfish Behavior Under Heat Stress:**
  - 71% of females and 79% of males shrank at least once.
  - 41% of fish shrank over multiple months.
    - **Shrinking thresholds:**
      - **Females:** after 80 mm.
      - **Males:** after 61 mm.
- **Adaptation Mechanism:**
  - Shrinking reduced metabolic load during extreme heat.
  - Synchronised shrinking between mating partners minimized social conflict and enhanced survival.
  - Delayed stress response: Heat exposure in the previous month triggered shrinkage; current heat sometimes encouraged growth (possibly due to metabolism boost).
- **Survival Advantage:**
  - Fish that never shrank had the highest mortality.
  - Shrinking even once reduced death risk by 78%.
  - Fish that shrank multiple times had 100% survival during the heatwave.



Clownfish were popularised by the Disney film *Finding Nemo*. GETTY IMAGES

In a marine heatwave, clownfish get small to get by

The Hindu Bureau

In 2023-2024, the world suffered a devastating coral bleaching event during which 84% of the world's reefs spanning 83 countries and territories were affected. Scientists have since linked the event to ocean warming and marine heatwaves – extended periods of high sea surface temperature than usual.

These phenomena are of great research interest because they have several consequences for marine ecosystems and the human livelihoods and industries that depend on them.

For example, a study in *Science Advances* on May 21 has now revealed that adult clownfish can shrink, regrow, and even synchronise these changes with their partners, using body size as a flexible tool to survive the stress of hot water.

During the 2023-2024 event, researchers from the UK and the US tracked 67 breeding pairs of wild clownfish (*Amphiprion percula*) in Kimbe Bay in Papua New Guinea for about 180 days. They caught each fish by net and measured its total length at the start of

During the heatwave, 71% of females and 79% of males shrank at least once. Fish that shrank repeatedly also showed the greatest bounce-back growth when conditions improved

the study and at the end of every lunar month. They also tied sensors by cable next to each anemone and recorded the water temperature every two minutes, used to estimate the heat stress the fish experienced.

To describe body-size change, team members calculated the monthly percentage change in length. Then they built Bayesian statistical models to test how shrinking and growth related to heat stress in the current and previous month, each fish's initial size, the size ratio between partners (a proxy of social conflict), and survival through the heatwave.

At the time of the heatwave, the team found 71% of females and 79% of males shrank at least once; 41% of those fish shrank over multiple months. The shrinkage thresholds differed by status: females tended to shrink only once they exceeded about 80 mm. and the males above 61 mm. Fish that shrank repeatedly also showed the greatest bounce-back growth when conditions improved.

The team also found that higher heat in the current month encouraged growth, perhaps via faster metabolism, while heat last month promoted shrinkage, suggesting a delayed stress response.

Shrinking also became less likely when the males and females were already close in size but more likely when their size gap was large, indicating that fish also adjust length partly to avoid aggression or eviction.

In all, the team reported that only 11 fish died: the fish that never shrank had the highest mortality. A single shrinking episode cut death risk by 78%, and all individuals that shrank multiple times survived the entire heatwave. Survival was even higher when both partners shrank together, suggesting coordinated size adjustment reduced conflict and metabolic load.

Researchers usually assume vertebrates, including fish, grow or stay the same size once they become adults, yet the clownfish routinely shrank to ride out extreme heat. According to the study, this let them balance the extra metabolic cost of living in warm water while maintaining social order inside the anemone.

If the ability to bounce back is widespread, the shrinking could help reef-fish populations survive more frequent marine heatwaves, but it may

- **Implication on Reproduction:**
  - Smaller adults lay fewer eggs, indicating a trade-off between survival and reproductive output.

Prelims pionter:

- Marine heatwave: A period of prolonged unusually high sea surface temperatures.
- Coral bleaching: Triggered when corals expel symbiotic algae due to heat stress.
- Clownfish: An example of adaptive plasticity in marine vertebrates.

Mains Pionter:

- **Climate Adaptation in Biodiversity:**
  - Clownfish shrinking is a novel adaptation strategy to survive extreme conditions.
  - Such behavioral plasticity may enhance resilience of reef communities.
- **Ecological Trade-offs:**
  - While shrinkage ensures survival, it may reduce future reproductive success, affecting long-term population dynamics.
- **Ecosystem Interdependency:**
  - Clownfish and anemones form mutualistic relationships — survival of one affects the other.
  - Coral bleaching affects entire reef ecosystems, including dependent species like clownfish.
- **Global Warming and Marine Systems:**
  - The frequency and intensity of marine heatwaves are rising due to climate change.
  - Ecosystem-based adaptation must account for such behavioral resilience but also recognize long-term ecological impacts.

Conclusion:

- The study of clownfish responses to marine heatwaves provides a critical lens into climate-induced behavioral adaptation among marine species. While it offers hope for resilience, it also signals the need for broader ecosystem protection and global climate mitigation efforts to safeguard biodiversity from intensifying oceanic stress.

UPSCPrelimsPractice Question

Ques: Which of the following statements best describes the adaptive strategy observed in clownfish during marine heatwaves?

a) They migrate to deeper waters.

b) They temporarily stop breeding.

c) They shrink in size to reduce metabolic load.

d) They switch to a vegetarian diet.

Ans : c)

UPSCMainsPractice Question

Ques : Climate change-induced marine heatwaves are not only threatening coral reefs but also altering the biology and behavior of marine species. Discuss with suitable examples, highlighting the implications for marine biodiversity and ecosystem stability.

Page 08 : GS 3 : Environment

India's marine fisheries sector, despite a stabilized harvest of 3–4 million tonnes annually, faces a paradox of overexploitation and poverty. On the International Day for Biological Diversity, this article underscores how overfishing, especially juvenile catch and bycatch, along with weak regulation, threatens marine biodiversity, fisher livelihoods, and long-term sustainability.

Overfishing — the threat to ocean wealth, livelihoods

Vijai Dharmamony

is Senior Manager, Climate Resilient Fisheries, Environmental Defense India Foundation

The Indian marine fisheries sector has stabilised at around three to four million tonnes of capture a year, indicating that India has reached its maximum potential yield.

Yet, despite this huge output, there is inequity. Small-scale fishers represent 90% of the fishing population but catch only about 10% of the volume; the remaining is by larger mechanised fishing operations. Further, three-quarters of India's marine fisher families live below the poverty line. Attempts to catch 'just one more kilo' with newer nets and bigger engines either yield no more fish or marginally increase volumes but with much higher debt, fuel and other costs for already hard-pressed communities.

On a recent fishing trip aboard a commercial shrimp trawler in the Arabian Sea, the full dynamic playout was evident. For every kilogram of shrimp retained on board, the nets disgorged over 10 kilograms of discarded bycatch. These were juvenile fish and non-target species which were tossed back (more dead than alive) into the waves.

India's multi-species, multi-gear fisheries make bycatch management especially intractable, with a single shrimp trawl impacting the populations of dozens of fish and invertebrate species. Such indiscriminate trawling damages marine biodiversity by degrading reef and oceanic communities, undermining food webs, and eroding the foundations of future catches.

The ecological consequences are stark. Juvenile fishing, facilitated by smaller mesh sizes (<25mm) that allow sub-legal fish to enter nets, depletes spawning stock biomass, driving long-term declines in commercially important species such as sardine and mackerel. These types of declines can take years or even decades to recover – or in worst case scenarios, are irreversible.

Such collapses abroad offer concerning precedents. Canada's Northern cod fishery crashed in 1992 under heavy harvest pressure, prompting a moratorium that still leaves stocks far below historical levels. Off California, the Pacific sardine fishery collapsed mid-century in the 1900s, forcing closures from 1967 to 1986 and again in recent decades as populations failed to rebound. India's regulatory framework is complicated, which only adds to this. All the coastal State/Union Territories have their own Marine Fisheries Regulation Act (MFRA), creating a patchwork of rules that unscrupulous fishermen can (and do) circumvent simply by landing their catch across a State border. A species protected as juveniles in one State may be legal in a neighbouring State, enabling the seamless laundering of undersized fish and undermining conservation efforts.

India should look into harmonising these disparities into a national standard by integrating scientifically established catch limits, have uniform minimum legal size (MLS), fishing gear restrictions, and closed seasons. Without these, India will continue to face MFRA enforcement issues, and consequent depletion of marine biodiversity.

Letting overexploitation continue will only deepen poverty, erode marine biodiversity and forfeit sustainable yields

Solutions to pursue

There are lessons from other countries. New Zealand's (fish) quota management system (QMS) has shown excellent results by aligning science and policy. Since its introduction in 1986, total allowable catches are calibrated against robust stock assessments – which have stabilised and, in some cases, rebuilt key fisheries, while providing clear, tradable quotas (individual transferable quotas) to commercial, recreational, and customary fishers alike.

Adapting the QMS for India's large mechanised trawl fleet, at least on a pilot basis, could curb the depletion of marine biodiversity by tying fishing allowances to actual stock health, rather than vessel size or fuel use. Targeted size limits and minimum legal-size regulations already pay dividends.

There are success stories from India. After Kerala enforced a minimum legal size for threadfin bream, catches rose by 41% within a single season – allowing fish to mature produces greater yields over time and better income for the fishers.

Reining in the fish-meal and fish-oil (FMFO) industry is another urgent priority. The bycatch feeding this industry creates perverse incentives, as more discard means more feed profits. In some States' trawl fisheries, over half the haul weight is low-value bycatch, much of which is juvenile fish. This bycatch is ground into meal and a lot of it is exported, while Indian fish consumers and the Indian aquaculture industry lose out on critical nutrition sources. Capping FMFO quotas, mandating on-board release of juveniles, or redirecting bycatch toward local aquaculture brood stock would align industry incentives with biodiversity conservation.

However, achieving these reforms demands action at multiple levels. At the national level, the central government needs to optimise vessel licences, infrastructure grants and fisheries subsidies, towards an ecosystem-based regulatory approach. States will need to bolster enforcement with well-equipped patrols and real-time reporting tools. Fisher cooperatives and village councils should be empowered as co-managers of local marine protected areas and breeding sanctuaries. Urban and rural consumers must wield their buying power, choosing only legally sized, sustainably sourced seafood, and refusing offerings that undermine marine biodiversity.

We stand at the crossroads

Climate-driven storms, coastal erosion, and market volatility already threaten India's nearly 8,000 km (recalculated to 11,098 km recently) coastline and its 3,000 plus fishing villages. Letting overexploitation continue will deepen poverty, erode marine biodiversity, and forfeit sustainable yields that could feed millions. But the solutions lie within reach: science-based quotas, harmonised regulations, community-led stewardship, and a policy shift that focuses on long-term sustainability.

On this International Day for Biological Diversity, let us pledge to protect India's vibrant marine life. We must do this not just for our food and livelihoods today but also for the ecological resilience and equitable prosperity of generations to come.

Key Issues Highlighted:

- Ecological Degradation
  - Juvenile fishing with small mesh nets (<25mm) depletes spawning stocks of commercial species like sardines and mackerels.
  - Indiscriminate bycatch, often over 10x the target species (e.g., shrimp), leads to mass marine mortality.
  - Destruction of reef ecosystems and food webs due to bottom trawling and mechanised fishing.
- Livelihood Crisis
  - Small-scale fishers, who form 90% of the workforce, catch only 10% of the total harvest.
  - 75% of marine fisher families live below the poverty line, further burdened by rising debt, fuel costs, and declining catch.
- Regulatory Fragmentation
  - India's coastal states follow different Marine Fisheries Regulation Acts (MFRA), causing legal loopholes:
  - A species protected in one state may be legally landed in another.
  - Weak enforcement leads to juvenile laundering across borders.
- Perverse Industrial Incentives
  - Fish-meal and fish-oil (FMFO) industries encourage juvenile bycatch for feed production.
  - Valuable protein-rich juvenile fish are ground for export, depriving Indians of affordable nutrition.

Global & Domestic Case Studies:

- Canada's cod collapse (1992) and California's sardine crash demonstrate irreversible fishery loss due to unregulated exploitation.
- New Zealand's Quota Management System (QMS) — a science-aligned model using tradable quotas — has successfully rebuilt fish stocks.
- In India, Kerala's threadfin bream MLS policy increased yields by 41% in a single season — evidence that legal size limits work.

Mains Pionter

- Biodiversity & Conservation:
  - Overfishing and juvenile catch threaten marine biodiversity, violating CBD goals and SDG 14 (Life Below Water).
  - Habitat destruction through trawling undermines ecosystem resilience.

- Economy & Livelihoods:
  - The marine sector supports over 3 crore livelihoods. Overexploitation will lead to:
    - Long-term economic insecurity
    - Reduced fishery exports
    - Nutritional stress in coastal populations
- Governance & Policy Gaps:
  - Lack of uniform regulation, real-time monitoring, and central oversight allows unsustainable practices.
  - Weak fisher participation in decision-making limits community ownership of marine resources.

Policy Recommendations:

- National Standardisation:
  - Harmonise MFRAs with uniform minimum legal size (MLS), closed seasons, and gear restrictions.
- Quota-Based Management:
  - Pilot quota management systems (like NZ) for India's mechanised fleets based on stock health.
- Reform FMFO Sector:
  - Cap bycatch usage quotas.
  - Mandate on-board juvenile release.
  - Redirect bycatch for local aquaculture broodstock.
- Empower Local Stakeholders:
  - Train and equip fisher cooperatives and village councils for co-management.
  - Promote marine protected areas (MPAs) and breeding sanctuaries.
- Consumer Awareness:
  - Push for certified sustainable seafood.
  - Encourage responsible consumption to align markets with conservation goals.
- Technology & Infrastructure:
  - Real-time digital monitoring systems, satellite tracking, and AI-assisted patrols for enforcement.

Conclusion:

- India's marine sector is at a critical juncture. If overfishing continues unchecked, it risks irreversible ecological damage, increased poverty, and loss of food security. The way forward lies in a multi-pronged strategy—science-based quotas, cooperative management, harmonised laws, and aligning industrial incentives with biodiversity protection. The cost of inaction, both ecological and human, is far too high.

UPSC Mains Practice Question

Ques: India's marine fisheries are trapped between rising yields and declining incomes. Discuss the ecological, social, and economic dimensions of overfishing in India and suggest sustainable alternatives.**(250 words)**

Page 09: GS 2 : Indian Polity

In response to recent military escalations with Pakistan and a terrorist attack, India launched a diplomatic outreach campaign, sending envoys to various countries to explain its stance. This initiative raises critical questions not just about foreign policy but also about narrative legitimacy, the role of media, and the crisis of credible communication in global politics.

Narrating the nation abroad

T.T. Sreekumar

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India's decision to send diplomatic envoys and delegates to various countries to explain its position on the recent combats with Pakistan and the terrorist attack that triggered them raises an important question: is this display of proactive diplomacy a mark of strength or a gesture of reassurance?

On the surface, the move can be seen as a strategic effort to manage international perception, pre-empt misrepresentation, and reinforce India's standing as a responsible global actor. Yet beneath that lies the more complicated reality of narrative legitimacy in a world where perception often outweighs fact, and international sympathy cannot be taken for granted. While much of the debate centres on the government's domestic strategy in selecting members of the delegation and the political calculations behind it, the more important questions ought to concern the necessity, effectiveness, and anticipated outcomes of such a move.

In the contemporary global order, it is no longer sufficient to act with self-justified conviction; states must constantly perform their legitimacy before an audience of allies, media, and institutions. India aims to convince the international community that its military response is calibrated, directed at non-state actors, and rooted in the imperative to defend its sovereignty against terrorism – not as a pretext for escalating an old and unresolved national rivalry. From this angle, the move reflects a calculated strength: a confidence that India's case, if communicated properly, can take the moral high ground and secure international solidarity.

But at the same time, the very need for such an extensive exercise points to an underlying legitimacy deficit. The fact that India must engage in diplomatic clarification suggests a concern that its actions might be misread, misframed, or lost in the noise of global crises. In that sense, the effort reflects not just a desire to assert control over the narrative but also a tacit recognition of the fragility of international opinion.

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Crisis of credibility

This vulnerability is amplified in an era when misinformation travels faster than official briefings. Recent examples during the India-Pakistan conflict show how easily falsehoods become facts in the public imagination. Old video footage, unrelated disaster clips, and even scenes from digital war games have been circulated online and passed off as real-time evidence of military operations or civilian suffering. Both Indian and Pakistani social media users have shared sensational content that turns out to be fabricated. AI-generated images and deepfakes complicate the picture, as they become harder to detect.

In such a climate, India's attempt to set the record straight may seem like swimming upstream, particularly when the people on both sides have already made up their minds based on viral clips and emotionally charged narratives.

What, then, is the implication of this collapse of credibility in the news? Does anyone care anymore about verifiable information as a public good? Or has the idea of news itself been absorbed into a larger game of affect and performance, where truth matters only insofar as it confirms one's pre-existing bias? This erosion of trust poses a deep philosophical crisis. The old saying that "truth is the first casualty of war" was once confined to the logic of state secrecy – governments hiding facts from their citizens in the name of national interest.

Today, however, the distortion of truth is no longer top-down alone – it is bottom-up, lateral, and participatory. Citizens actively produce the falsehoods they wish to believe, and in doing so, dissolve the very distinction between truth and illusion.

This situation resonates powerfully with Jean Baudrillard's provocative claim that "The Gulf War did not take place." He did not mean that bombs were not dropped or that people did not die. Rather, he argued that the war was consumed entirely as spectacle – televised, mediated, edited – such that the reality of war was displaced by its simulation. In our time, that idea has become almost literal: the simulated now overrides the real in public perception.

In the realm of the humanities, where the pursuit of meaning, narrative, and ethical clarity is central, the end of credible news represents a profound loss. Without the possibility of shared facts, even argument becomes impossible. Disagreement presupposes agreement on the basic ground of what is happening. When that ground collapses, what remains is not debate but disorientation.

In this sense, India's diplomatic campaign is not just a strategic act of persuasion – it also represents a battle to restore the very conditions under which persuasion is meaningful. It remains unclear whether this effort signals an admission of vulnerability or a reassertion of strength – an attempt to reaffirm the nation's authenticity, rooted in the accumulated legacy of the Non-Aligned Movement years.

However, if this effort fails, then no amount of military precision or moral clarity will matter, because the audience will no longer be capable of distinguishing a justified action from a manufactured illusion.

Hence, the deeper question is not whether India can explain itself to the world, but whether the world still retains a framework within which such explanations are heard as truth and not dismissed as just another version of the story.

To lose that is to lose more than credibility – it is to lose our last bid for a politics of authenticity.

Key Themes & Issues:

- **Narrative Diplomacy in the Age of Perception**
  - India's campaign seeks to shape international opinion, preempt misinformation, and portray itself as a responsible actor combating terrorism.
  - This form of proactive diplomacy is strategic in nature, aiming to secure moral legitimacy and global support.
  - However, it also reflects a deeper vulnerability: a fear that actions could be misrepresented or dismissed in an international system flooded with noise and bias.

- **Erosion of Credibility and the Collapse of Facts**
  - The modern media environment — dominated by deepfakes, AI-generated content, and viral misinformation — challenges the credibility of official communication.
  - In conflicts like India-Pakistan, fabricated content spreads rapidly on social media, distorting reality and fueling emotional nationalism.
  - This shift marks a transformation from the state-centric secrecy of the past to a participatory distortion of truth, where citizens themselves create and share false narratives.

- **Truth as a Public Good Under Threat**
  - The essay raises philosophical concerns about the status of truth in public discourse:
    - Is verifiable information still valued?
    - Has news become performance, reinforcing pre-existing beliefs rather than informing reasoned debate?
  - The erosion of shared facts eliminates the foundation of deliberative democracy, where disagreement assumes a common reality.

- **Simulated Realities and the Crisis of Persuasion**
  - Drawing from Jean Baudrillard, the article suggests that media spectacle can overtake real events, creating a hyperreality where war and diplomacy are consumed as images, not realities.
  - In such a world, diplomatic efforts may fail not because of flawed content, but because the audience no longer trusts the format of official communication.

Mains Pointer:

- Diplomacy today is both performative and persuasive — nations must actively craft and communicate their stories.
- The fragmentation of media trust means that strategic communication is as critical as military or economic action.
- There is an urgent need for media literacy, information ethics, and global norms on digital misinformation to restore trust in public narratives.
- India's diplomatic outreach is not just about foreign policy positioning, but also about defending the very epistemological ground on which legitimacy stands.

Conclusion:

India's diplomatic campaign is not merely a foreign policy manoeuvre — it is a struggle to preserve the very fabric of meaningful persuasion in a world drifting toward hyper-reality and digital disinformation. The real challenge is not whether India can explain its position, but whether the global audience is still capable of discerning the truth amid overwhelming noise. Diplomacy, in this sense, is also a battle for epistemic sovereignty — the right to be heard, believed, and understood in a fractured information landscape.

UPSC Mains Practice Question

Ques: In the age of misinformation, diplomacy must go beyond policy to perform narrative legitimacy. Discuss this statement in the context of India's recent diplomatic outreach and the global information order.**(250 words)**

Page : 08 Editorial Analysis

Development without the savaging of urban biodiversity

Biodiversity, which refers to the variety and the variability of living organisms on this earth – and fundamental to human well-being, a healthy planet, and economic prosperity for all– is under peril. About 25% of species are facing the threat of extinction.

The theme for International Day for Biological Diversity this year (observed annually on May 22) is "Harmony with nature and sustainable development". The date 'commemorates the adoption of the text of the Convention on Biological Diversity (CBD) on May 22, 1992'. The Kunming-Montreal Global Biodiversity Framework (GBF) was also developed by the CBD with four goals as well as 23 targets to conserve global biodiversity (conserve and manage 30% of terrestrial and marine biodiversity) by 2030. Target 12 of the GBF lays emphasis on enhancing green and blue spaces in cities and urban planning for human well-being and biodiversity conservation. Goal 11 of the United Nations Sustainable Development Goal also states the importance of making cities and human settlements safe, resilient and sustainable. But, still, urban biodiversity is under great threat with unplanned development and human greed.

Green space in urban sprawls

Almost half the world's population lives in urban areas, a percentage that is expected to rise to 70% by 2050. City spaces are of premium value and face competing demands. In such a situation, do we have space for greenery? The answer is yes if you consider the range of benefits urban biodiversity offers.

First, health benefits. Urban trees provide provisional services such as food, fibre and water, minimise the urban heat island effect (a much discussed topic) and help in flood control. They help in temperature control, pollution abatement, water conservation and carbon sequestration, and keeping carbon dust and suspended particulate matter in check. Tree lines of a 10 metre width can reduce noise pollution by 5 decibels. In Frankfurt, green belts were shown to reduce the temperature by 3.5° C and increase the relative humidity by 5% when compared to the city centre. Green spaces also provide much needed recreational and spiritual services in the form of parks in what would otherwise be concrete jungles.

Second, economic benefits. Theodore Endreny, Professor of Water Resources and Ecological Engineering, State University of New York College of Environmental Science and Forestry estimated the value of annual services provided by mega city trees to be around $9,67,000 (₹8 crore) per square kilometre of tree cover. Therefore, protecting existing greenery, pursuing the development of parks and new urban green spaces, establishing tree avenues along the roads, and conserving natural rivers and water bodies should be undertaken. The key element of developing green infrastructure is promoting community health and well-being.

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City managers must mainstream biodiversity considerations in decision making, and make conservation a mass movement in cities

In its latest report, the Forest Survey of India has estimated the average forest cover in leading urban cities to be only 10.26% of their geographical area (Mumbai 25.43%; New Delhi and Hyderabad 12.6%, Bengaluru, Chennai and Ahmedabad 6.85%, 4.66% and 3.27%, respectively). Chennai and Hyderabad have lost 2.6 and 1.6 square kilometres of forest cover between the 2021 and 2023 assessments.

The GBF gives a framework to urban planners for biodiversity conservation in cities by protecting blue and green spaces and developing new ones. It suggests enhancing native biodiversity, ecological connectivity and improving human health and well-being.

In this context, the UN Habitat's 3-30-300 prescription is relevant. The principle is: Every home, workplace, or school should have a view of at least three established trees. Neighbourhoods should have a minimum of 30% tree canopy cover and a public green space of at least 0.5 to 1.0 hectares, should be accessible within a 300-metre walk or bike ride from every home.

City biodiversity index

A city biodiversity index is prepared based on the present status of the city in terms of three large parameters – the extent of native biodiversity in the city, ecosystem services provided by them and the level of governance of biodiversity. The International Council for Local Environmental Initiative (ICLEI) Asia has prepared a city biodiversity index using 23 indicators for cities such as Kochi, Gangtok and Nagpur. Once the current biodiversity status of the city is assessed through a survey, a local biodiversity strategy and action plan (LBSAP) is prepared to improve the status of the city in terms of biodiversity conservation and sustainable human welfare.

Urban areas have the resilience to support biodiversity if there is an enabling environment. Local biodiversity could be augmented while undertaking plantations in cities. In Chennai, the greening of the Chennai Koyambedu market in 2021 (undertaken by the Care Earth Trust with the financial support of Chennai Metropolitan Development Authority) helped in the natural regeneration of 141 species of higher plants belonging to 39 families and 106 genera within two years. The site also attracted 35 bird and 27 butterfly species that are considered bioindicators of biological diversity. The Koyambedu model mimics a three-storied natural forest which would be better than the Miyawaki model to enhance native biodiversity in small parcels of land available in cities.

The Care Earth Trust prepared a strategy and action plan in 2018 for the Greater Chennai Corporation (GCC) to plant one million native trees in Chennai city over five years. The sprawling Madras Race Club land at Guindy is being transformed into a lake for augmenting groundwater recharge. However, urban development and encroachment has swallowed up many waterbodies in and around Chennai and Bengaluru. The crucial Pallikaranai marsh in Chennai which was once considered a wasteland and garbage dump has been partly restored and declared as a reserved forest (Ramsar site). Most urban waterbodies are losing their ecological integrity due to garbage and sewage pollution. They must be ecologically restored after preventing garbage dumping and treating sewage through conventional treatment or nature-based solutions. Ensuring legal protection to the remaining lakes and waterbodies in urban areas is a necessity before they are lost.

Many independent houses in Chennai have now given way to multi-storeyed flats leading to the disappearance of home garden trees (coconut, mango, jackfruit). This could also be a reason for the reduction in the city's green cover. As a condition to granting planning permission for new structures, the GCC should consider mandating the planting of at least five trees in a plot that measures over 2,400 square feet along the plot boundary. This will help greening the city in a decentralised manner. The horticulture department should also promote roof gardens and kitchen gardens for every household to m cultivate greens and medicinal plants. This will not only help in augmenting city biodiversity but also help in improving the health and well-being of people.

Need for collective action

City managers need to take stringent action against those who destroy greenery and pollute waterbodies. It is heartening that the Supreme Court of India has been tough on the executive for the mass destruction of trees over acres in the Kancha Gachibowli area in Hyderabad, for the development of IT infrastructure. Development should not lead to the wanton destruction of biodiversity. City managers must mainstream biodiversity considerations in decision making, taking a long-term view to achieve sustainable development. The involvement of all stakeholders such as the resident welfare associations, non-governmental organisations and corporates in city greening and protecting waterbodies from pollution and encroachment is important to make biodiversity conservation a mass movement in cities.

The views expressed are personal

Paper 03:Environment

UPSC Mains Practice Question:Analyze the impact of rapid urbanisation on green and blue spaces in Indian cities. How can frameworks like the Kunming-Montreal Global Biodiversity Framework and the UN Habitat's 3-30-300 rule help mitigate these impacts? (250 words)

Context :

Urbanisation is rapidly expanding, with 70% of the world population projected to live in cities by 2050. While urban areas are engines of economic growth, they pose serious threats to biodiversity due to unplanned development and ecological neglect. The International Day for Biological Diversity (May 22) and the Kunming-Montreal Global Biodiversity Framework (GBF) bring the issue into sharp focus.

Key Highlights and Issues

- **Biodiversity at Risk**
  - Around 25% of species face extinction due to habitat loss, pollution, and human activity.
  - The CBD and GBF have set global targets to protect 30% of land and marine biodiversity by 2030.
- **Importance of Urban Biodiversity**
  - Urban green and blue spaces (trees, rivers, lakes, parks) are critical for:
  - Human health: cooling urban heat islands, reducing air and noise pollution, mental wellness.
  - Climate resilience: carbon sequestration, flood mitigation, groundwater recharge.
  - Economic benefits: Estimated annual ecological service value of ₹8 crore/km^2 in megacities.
- **Grim Urban Forest Statistics**
  - India's urban forest cover is only 10.26% on average.
  - Mumbai leads with 25.43%, while Chennai (4.66%) and Ahmedabad (3.27%) lag behind.
  - Chennai and Hyderabad lost 2.6 and 1.6 sq.km of forest between 2021 and 2023.

Policy and Planning Frameworks

- **Global Biodiversity Framework (GBF)**
  - Target 12: Enhance green/blue spaces in cities for human and ecological well-being.
  - Promotes ecological connectivity, native biodiversity, and urban planning integrated with sustainability.

- **UN Habitat's 3-30-300 Rule**
  - Every home should:
    - Have a view of 3 trees.
    - Be in a locality with 30% tree canopy.
    - Have access to a public green space within 300 metres.
- **City Biodiversity Index (CBI)**
  - Developed by ICLEI with 23 indicators to assess urban biodiversity health.
  - Examples: Kochi, Gangtok, Nagpur have adopted it for planning and local biodiversity strategy.

Successful Urban Models

- **Koyambedu Market (Chennai)**
  - Reforestation led to the natural regeneration of 141 plant species, 35 bird species, and 27 butterfly species.
  - Demonstrates the feasibility of restoring native biodiversity even in dense urban areas.
- **Pallikaranai Marsh (Chennai)**
  - Once a dumping ground, now a Ramsar-recognized reserved forest.
  - Indicates the potential of ecological restoration with legal backing.
- **Challenges and Concerns**
  - Encroachment on lakes and wetlands by construction and real estate.
  - Pollution from garbage and sewage damaging waterbodies.
  - Disappearance of home gardens due to vertical urban development.
  - Weak enforcement of environmental regulations.

Suggested Solutions and Way Forward

- **Legal Protection**: Recognize urban waterbodies as ecological assets and enforce protection laws.
- **Mandatory Tree Plantation:** Urban planning permissions must include tree-planting conditions.
- **Roof and Kitchen Gardens:** Incentivise home-grown biodiversity through awareness and subsidies.
- **Community Engagement:** Empower RWAs, NGOs, and citizens in biodiversity preservation.
- **Nature-Based Solutions (NbS):** Use eco-sensitive restoration methods over concrete-heavy engineering.

Judicial Intervention

- The Supreme Court has taken a firm stance against indiscriminate deforestation, e.g., in Hyderabad's Kancha Gachibowli.
- Highlights the judiciary's growing role in enforcing environmental accountability.

Conclusion

- Urban biodiversity must not be sacrificed at the altar of development. With robust legal frameworks, strategic planning (like the GBF and 3-30-300 rule), and community participation, Indian cities can harmonise growth with ecological integrity. Sustainable urbanisation should be anchored in the preservation of nature — not its exploitation.