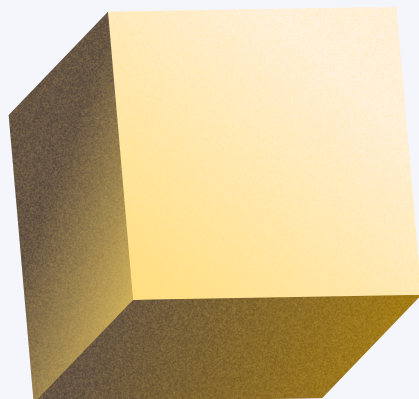


# THE HINDU ANALYSIS

**31st March 2024**  
by saurabh pandey



Q) What role climate change has in shaping relation between countries?

World climate is continuously changing and various countries are facing negative impact of climate change due to which climate change has become a new chapter in development of relations between the nations.

Role of climate change is shaping countries relation

i) European union has introduced carbon border mechanism ~~the~~ policy, which will hinder the trade of developing nation with them.

ii) China is supplying water from melted glaciers of tibet to Maldives which is facing water shortage <sup>fresh</sup> because of sea level rise. Can cause drought in India.

iii) Intra country migration can be seen due to climate change e.g. in Latin America and sub Sahara area

iv) Strengthening collaboration among nations through forums like International solar alliance to promote clean energy.

# U.P.S.C

(v) Vannants sued developed countries for not adhering to climate mitigation and adaptation norms in I C T, can deformate relation between them.

(vi) Country's collaboration in climate bank declaration to reduce the emission from shipping and promote green shipping.

(vii) India is also developing green energy partnership with Denmark, a new dimension for developing relation.

(viii) India focusing to develop hydrogen fuel partnership with Japan, South Korea as mentioned in national hydrogen policy.

(ix) Therefore, there is the need of collab -orative effort among countries and climate change becoming significant part of developing relation among nation can help in achieving our NDC, SDG targets and develop sustainable future.

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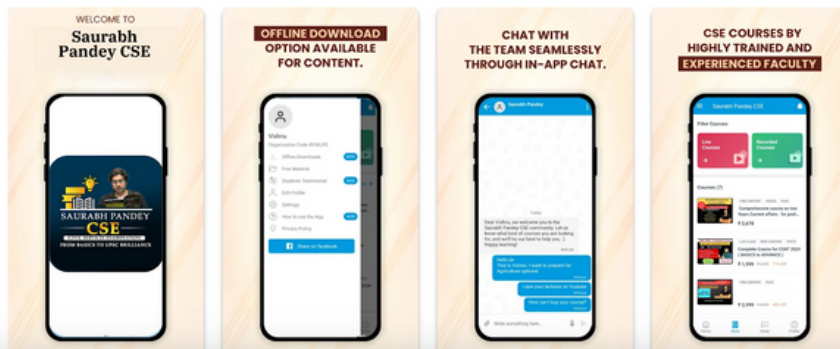


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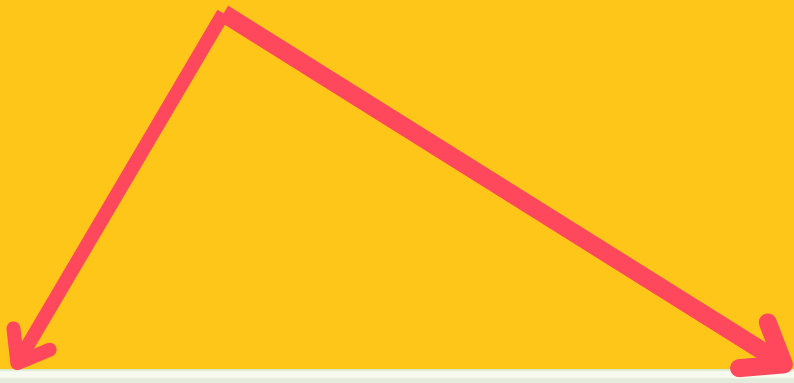


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# Will global forest expansion hit tribals?

What are the concerns about the Global Biodiversity Framework which aims to increase areas under forest cover, inland water, coastal and marine areas to at least 30% of the world's terrestrial area? What is the situation in India?

Rahul Karmakar

**The story so far:**

A symposium on the rights of indigenous people organised by the University of Arizona on March 21-22 put the spotlight on the Kunming-Montreal Global Biodiversity Framework (GBF) and how, in conjunction with the Forest (Conservation) Amendment Act of 2023, it will hit India's tribes the hardest. Many at the symposium foresaw doom for the country's indigenous communities already affected by the establishment of national parks.

**What is the Kunming-Montreal GBF?**

This framework was adopted during the 15<sup>th</sup> meeting of the Conference of the Parties to the UN Convention on Biological Diversity in December 2022 following a four-year consultation and negotiation process. It claims to support the achievement of sustainable development goals and build on previous strategic plans, paving "an ambitious pathway to reach the global vision of a world living in harmony with nature by 2050." Accordingly, four goals were set for 2050 and 23 targets for 2030 toward planning, monitoring, reporting and reviewing implementation, organising finance, and drawing up strategies for capacity development, technical and scientific cooperation, and an agreement on digital

Activists say meeting the GBF targets will threaten the existence of indigenous populations

sequence information on genetic resources. In adopting the GBF, all parties have committees to set national targets to implement it. Participating at the event, New Delhi-based rights activist Suhas Chakma drew the attention of environmentalists and leaders of indigenous communities to Target 3 of the Kunming-Montreal GBF, which aims to "increase terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services" to at least 30% of the world's terrestrial area. At present, protected areas (PAs) cover about 16%.

**What are its implications?**

Participants at the 'Symposium on Conservation, Racism, and Indigenous Peoples Human Rights' felt that the seemingly benign goals of the GBF tilt the scale in favour of corporate houses eyeing forest resources at the expense of the indigenous communities living with nature. Indigenous peoples have been denied the right to housing, health, education, electricity, and security in Indonesia's Ujungkulon National Park while Heng Saphen, an indigenous leader living inside the Beng Per Wildlife Sanctuary of Cambodia was convicted by a kangaroo court for cultivating on her own land. About 18% of Cambodia's Botum Sakor National Park stands protected after much of its land was sold off to private firms, the participants said. Involving the private sector in forest conservation is a bad idea and India has taken a step in that direction with the Forest (Conservation) Amendment Act to 2023 to include zoos, safaris, ecotourism facilities, etc., as forest activities, Mr. Chakma pointed out. The UN Special Rapporteur on Indigenous Peoples, José Francisco Cali Tzay, said the PAs were initially created "as recreational opportunities, hunting grounds for western colonial elites". The concept, the participants pointed out, has not changed much with ecotourism or sustainable ecotourism projects reducing the indigenous peoples to animals in a zoo, made to sit in "model replicas" of traditional houses wearing traditional dresses and ornaments, and playing traditional musical instruments.

**What would GBF mean for India?**

About 84% of India's national parks (89 out of a total of 106) were established in areas inhabited by the indigenous peoples and meeting the GBF targets will threaten their existence, the activists said. For instance, the initiative to upgrade the Kumbhalgarh Wildlife Sanctuary in Rajasthan to a tiger reserve will affect 162 tribal villages located inside and outside the sanctuary while the expansion of the Nauradehi Sanctuary in Madhya Pradesh is set to affect 62 villages of mostly tribal people. In Assam, the June 19, 2022, notification for the Barak Bhuban Wildlife Sanctuary will affect the indigenous groups. The gazette notification states that the sanctuary "is free from encroachment as per record, there are no rights and concessions of any person in the area" but the Khasis possess documents showing they have been living in the area since 1914.

**What can be done to protect the tribal lands?**

Mr. Chakma said a multilateral agreement like the Kunming-Montreal GBF cannot be amended but the government of India needs to change its policy.

First, it has to recognise the right to free, prior, and informed consent as guaranteed under the Panchayats (Extension to Scheduled Areas) Act and make further amendments to the laws to make the tribals custodians of the PAs as nature has largely been protected because of their special relations with the forests and their denizens. Secondly, the government of India should not only target the tribal areas simply because they do not matter electorally.

"That Uttar Pradesh and Bihar only have one national park each - Dudhwa inhabited by the indigenous Tharu people and Valmiki inhabited by the Tharus, Oraons, Mundas, etc. - speaks for itself. If tiger reserves can be created in areas where there are no tigers such as Sahyadri (Maharashtra), Satkosia (Odisha), Kamlang (Arunachal Pradesh), Kawal (Telangana), and Dampa (Mizoram), there is no reason why PAs cannot be created in non-tribal areas," he said. Finally, India ought to address human rights violations in the PAs seriously.

Human rights issues of these people such as access to education, healthcare, and housing cannot be left to the Wildlife or Forest Department. Thousands of indigenous people living within the PAs must be respected and recognised for preserving the biodiversity and the ecosystem and not punished, he said.



GETTY IMAGES



The hindu analysis by saurabh pandey sir





# What is the Kunming-Montreal GBF?

## What is the Kunming-Montreal GBF?

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- **Accordingly, four goals were set for 2050 and 23 targets for 2030 toward planning, monitoring, reporting and reviewing implementation, organising finance, and drawing up strategies for capacity development, technical and scientific cooperation, and an agreement on digital sequence information on genetic resources.**
- **In adopting the GBF, all parties have committees to set national targets to implement it.**



- **Target 3 of the Kunming-Montreal GBF, which aims to “increase terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services” to at least 30% of the world’s terrestrial area. At present, protected areas (PAs) cover about 16%.**



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## Imaging detects hypoxic pockets in the mouse brain

Using a bioluminescent oxygen indicator, scientists discovered a spontaneous, spatially defined occurrence of “hypoxic pockets” in the mouse brain. Their technique offers a way to learn more about brain oxygen tension ( $pO_2$ ), a measure of oxygen delivery and demand in brain tissue that changes dynamically but is not well understood. The findings could have implications for how rest and exercise affect  $pO_2$  in the human brain, including the role of these activities in conditions such as dementia.





# “hypoxic pockets”

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- Their technique offers a way to learn more about brain oxygen tension (pO<sub>2</sub>), a measure of oxygen delivery and demand in brain tissue that changes dynamically but is not well understood.



## 4 mpox vaccines in animals reveal correlates of protection

Scientists have made new discoveries about the effectiveness of four vaccines for the mpox virus – and have uncovered potential signs of immune activity that correlate with protection. Their head-to-head comparison could inform further research into safer and improved vaccines for mpox. All four vaccines protected the macaques from infections when exposed to the current outbreak strain of mpox. However, one vaccine provided almost complete protection.







# m pox vaccine

- Scientists have made new discoveries about the effectiveness of four vaccines for the mpox virus – and have uncovered potential signs of immune activity that correlate with protection.
- Mpox (formerly known as monkeypox) is a viral disease caused by infection with the monkeypox virus.
- Monkeypox virus is part of the same family of viruses as variola virus, the virus that causes smallpox.
- Mpox is rarely fatal and its symptoms are similar to smallpox, but milder.
- Mpox is not related to chickenpox.
- Mpox is a zoonotic disease, meaning it can be spread between animals and people. It is endemic (found naturally) in regions of central and west Africa. Monkeypox virus has been found in small rodents, monkeys, and other mammals that live in these areas

# Sprouting a sandalwood sapling



**SPEAKING OF  
SCIENCE**

**D. Balasubramanian**

Sandalwood hardly needs an introduction to the readers of *The Hindu*. It has been valued for many centuries, for its fragrant oil, its prized wood, and the many medicinal uses it has been put to. The tree that all this comes from, however, is not all that familiar. Growing in deciduous forests, it is a partial, or hemiparasite that needs four or five other trees growing around it. Under the ground, sandalwood roots form a haustorium that forms an octopus-like hold on the host tree's roots, from where water

and nutrients are taken.

The sandalwood fruit is probably even more unfamiliar. About 1.5 cm in diameter, the fleshy fruit is a shiny purplish black when ripe. The one seed inside is a hard, dry kernel, not the usual tough seed coat protecting a fleshy interior. This makes it difficult for the seed to survive beyond one season.

Both the above properties - the need for other trees in the early growth phase, and the seeds, which are short-lived and cannot be stored, have added to the overexploited tree's difficulties. This has led to a drastic fall in the number of sandalwood trees in the forests of South India. The IUCN has classified sandalwood as a vulnerable species. It is not surprising that Australia is



**Ideal way:** Passage through the digestive system of birds is good for the seeds as they have better chances of maturing into trees.

now the world's largest supplier of sandalwood and its oil.

### Dispersal by birds

The fruit is bitter, and not to human tastes. But it is loved by birds. About 10 species, such as the Asian Koel, and the Gray Hornbill

swallow the fruit whole, and over time drop the seeds at great distances from the tree they feasted on. These birds are among India's larger frugivores, or eaters of fruit. The sandalwood tree's fruit is just right for the koels and hornbills. It has been estab-

lished that sandalwood trees that produce larger seeds usually end up with the seeds close by. Although the large seeds are better equipped for germination, birds cannot swallow those large seeds, and drop them off after pecking away at the flesh.

The passage through the digestive system is good for the seeds. The seeds now germinate very quickly and have better chances of maturing into trees. This is the reason why forests, and not plantations, are where we get to see a few mature sandalwood trees. Sadly, the thinning of forests has reduced bird populations, and therefore the chances of proper seed dispersal.

Can humans try to emulate birds? Researchers at the Kerala Agricultural University in Thrissur, work-

ing with European colleagues have tried various ways of priming sandalwood seeds for germination (*Forests*, 14:1076, 2023). Best results were obtained when they soaked freshly collected sandalwood tree seeds in a 5% solution of polyethylene glycol-6000 for two days. This interesting synthetic substance induces osmotic pressure on the cells of the seed and pushes the germination process forward. This is called osmopriming, and when done correctly is more effective than soaking in just water. The sprouting rate was 79% compared to 45% when just planting the seed.

(The article was written in collaboration with Sushil Chandani, who works in molecular modelling)





# sandalwood

- sandalwood roots form a haustorium that forms an octopus-like hold on the host tree's roots, from where water and nutrients are taken.
- one seed inside is a hard, dry kernel, not the usual tough seed coat protecting a fleshy interior.
- This makes it difficult for the seed to survive beyond one season.
- Both the above properties - the need for other trees in the early growth phase, and the seeds, which are short-lived and cannot be stored, have added to the overexploited tree's difficulties.
- This has led to a drastic fall in the number of sandalwood trees in the forests of South India. The IUCN has classified sandalwood as a vulnerable species.
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## **osmopriming**

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# Naturally occurring bile acid can blunt statin-induced diabetes

## Vasudevan Mukunth

Administering ursodeoxycholic acid (UDCA) can stave off the tendency of statins to induce glucose intolerance and diabetes, a study by a group of researchers in China has found.

Statins are prescribed to people with a high risk of cardiovascular disease. They work by blocking the activity of an enzyme involved in the metabolic pathway that produces LDL, or "bad", cholesterol.

Statins are on the World Health Organization's list of essential medicines and among the most sold drugs worldwide.

However, many studies have found statins could increase the risk of developing diabetes.

### 'Frank diabetes'

"It has been known for a few years now that statins can induce glucose intolerance and even frank diabetes in some people," Dr. V. Mohan, chairman of the Madras Diabetes Research

Foundation, Chennai, told *The Hindu*.

He added that doctors have continued to prescribe them because statins' benefits "far outweigh the risk". Nonetheless, the mechanism by which statins have this effect has been unclear.

In the study, published in February in the journal *Cell Metabolism*, the researchers reported one mechanism through which statins could increase glucose intolerance, involving UDCA, a bile acid.

The team recruited 30 people with atorvastatin and 10 without and tracked their metabolism for four months.

They reported that the faeces of those taking atorvastatin had a reduced abundance of bacteria of the genus *Clostridium* and that these individuals had "altered serum and faecal bile acid profiles" as well.

### Gut microbiome

The gut microbiome is a community of bacteria in the gut in a symbiotic rela-

tionship with the body. The researchers found that the *Clostridium*-deficient microbiome inhibited enzymes called hydroxysteroid dehydrogenases and lowered UDCA.

They also verified an idea that "the decreased *Clostridium*-rich microbiota might influence bile acid synthesis and excretion and impair glucose metabolism" in a 12-week study of mice.

To check the role of UDCA, they recruited five participants on statins and ad-

ministered 10-13 mg/kg (of body weight) of UDCA per day. After two months, they found the individuals' HbA1C levels, among others, were "substantially decreased".

They concluded that "UDCA restored impaired glucose homeostasis without limiting the lipid-lowering effect of statin".

Dr. Mohan called the finding "good news" and "a new angle" but also said the underlying hypothesis will have to be tested in randomised clinical trials.





# **Statins , bad cholesterol and frank daibetes**

- **Statins are prescribed to people with a high risk of cardiovascular disease.**
- **They work by blocking the activity of an enzyme involved in the metabolic pathway that produces LDL, or “bad”, cholesterol.**
- **Statins are on the World Health Organization’s list of essential medicines and among the most sold drugs worldwide.**
- **However, many studies have found statins could increase the risk of developing diabetes.**
- **pre-diabetes (also known as frank diabetes): an impaired state (impaired fasting glucose - IFG - or impaired glucose tolerance - IGT) in which these markers are altered toward the level of diabetes.**

# Good and bad cholesterol

<p>Good cholesterol refers to a type of cholesterol which helps the body by transporting bad cholesterol from the blood into the liver</p>	<p>Bad cholesterol refers to a type of cholesterol which increases the risk of cardiovascular disease</p>
<p>High-density lipoprotein (HDL)</p>	<p>Low-density lipoprotein (LDL)</p>
<p>The particle density of a molecule is high</p>	<p>The particle density of a molecule is low</p>
<p>Takes LDL out of the blood, preventing the buildup of cholesterol on the walls of the arteries</p>	<p>Builds up on the walls of the arteries, causing atherosclerosis</p>
<p>Levels should be 60 mg/dL or above</p>	<p>Levels should be less than 40 mg/dL</p>
<p>Higher levels is beneficial for the health</p>	<p>Lower levels is beneficial for the health</p>

# Tropical cyclones of higher intensity demand a new category

Tropical cyclones with peak wind speeds far exceeding category 5 scale of 252 km/hour are increasingly seen due to global warming, making a case for introducing category 6 for wind speed above 309 km/hour

Madhavan Nair Rajeevan

**T**ropical cyclones are powerful and destructive weather systems that form over warm tropical ocean basins, where sea surface temperatures are above 26.5 degree C. These storms are characterised by strong winds, heavy precipitation and storm surges and can cause significant damage to coastal communities and infrastructure.

Climatologically, tropical cyclones form mainly in the North Atlantic, East Pacific, West Pacific, South Pacific and the Indian Ocean. Out of 85 tropical storms that develop annually over the warm tropical oceans, more than half (45) of them intensify into tropical cyclones. The Western Pacific basin is the most active region for tropical cyclones and accounts for about a third of the world's tropical cyclones. The North Indian basin accounts for only about 4% of the global total, although it is one of the most vulnerable regions in the world to the effects of such cyclones.

The Saffir-Simpson (SS) hurricane wind scale, introduced in the early 1970s, is the most widely used metric for warning the public about the dangers of tropical cyclones. The SS hurricane wind scales are categorised by the maximum sustained wind speed at a height of 10 metres. Although most tropical cyclone-related deaths are caused by storm surge and heavy rainfall, wind hazard remains an important metric for communicating risk to the public and a critical metric

## Global warming intensifies tropical cyclones

Tropical cyclones form mainly in the North Atlantic, East Pacific, West Pacific, South Pacific and the Indian Ocean

- Saffir-Simpson (SS) hurricane wind scale introduced in the early 1970s has five categories. Wind speed exceeding 252 km/hour fall under category 5

- Long-term data indicate that the frequency of intense tropical cyclones is

**Increasing occurrence:** Five tropical storms with wind speeds over 309 km/hour occurred in the last nine years.

increasing in the large ocean basins

- For every degree of warming, an increase in wind speed of 12% is observed in the strongest cyclones

- Tropical cyclones with wind speed far exceeding category 5 are becoming common. A new category 6 scale for wind speed over 309 km/hour may be required

- The Western Pacific

basin is the most active region for tropical cyclones, and accounts for about a third of all tropical cyclones. The north Indian basin accounts for about 4%

- At present, the north Indian Ocean is not very vulnerable to category 6 storms. As global warming continues, category 6 storms may occur here in near future

- There is a need to revisit India's disaster management strategy for tropical cyclones and the early warning systems

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for measuring the impact of these cyclones. There are five categories on the SS hurricane wind scale – category 1 to category 5 – with category 5 wind speed exceeding 252 km/hour. The combined effects of wind, storm surge, and rainfall in a category 5 impact would completely raze any structure.

The sharp rise in man-made greenhouse gas emissions has led to global warming of the order of 1.10 degree C since pre-industrial times. The warming can be observed not only at the sea surface, but also in the depths of the ocean, which increases the heat content of the ocean and thus favours the intensification of tropical cy-

clones. Long-term data indicate that the frequency of intense tropical cyclones is increasing in the large ocean basins. For every degree of warming, an increase in wind speed of 12% is observed in the strongest cyclones, which corresponds to a 40% increase in destructive potential. As warm waters extend further poleward, cyclones are shifting poleward, with more storms forming at higher latitudes than in the past. A warmer atmosphere can hold more moisture, leading to heavier rainfall when tropical cyclones make landfall. As the oceans warm, cyclones also strengthen faster and spend more lifetime over the oceans. In 2023, tropi-

cal cyclone Freddy spent 37 days over the oceans, making it the longest-lived cyclones ever recorded.

### Category 5

In a recent research paper published in the *Proceedings of National Academy of Sciences*, the authors document that storms are occurring at intensities well above Category 5 and that record wind speeds are likely to continue as the planet continues to warm. At the time of its introduction, the SS wind scale did not foresee the need for a tropical cyclone-beyond category 5. However, due to global warming, there is now a need to define a category 6 cyclone. The authors therefore proposed to

introduce a hypothetical modification of the SS wind scale to tie category 5 to peak wind speeds between 252-309 km/hour and to include an additional category 6 above 309 km/hour.

Observations indicate that of the 197 tropical cyclones categorised as category 5 in the 42-year period from 1980 to 2021, half occurred in the last 17 years of the period. Five of these storms which occurred in the last nine years of the record, exceeded the hypothetical category 6 (with wind speeds of over 309 km/hour). Simulations of future climate change suggest that the annual exceedance of the category 6 threshold will increase even more in the regions where intense tropical cyclones currently occur. It is expected that the proposed 6th category of the SS wind scale could raise awareness of the dangers of the increased risk of large cyclones due to global warming.

At present, the North Indian Ocean is not as vulnerable to category 6 storms. However, as global warming continues unabated, there is a good chance that a category 6 storm with maximum wind speeds of over 309 km/hour may occur over the North Indian Ocean in the near future. Therefore, there is a need to revisit India's disaster management strategy for tropical cyclones and the early warning systems.

(Madhavan Nair Rajeevan was former secretary to the Government of India and presently the Vice Chancellor, Atria University, Bengaluru)



# NEW SCALE OF TROPICAL CYCLONE

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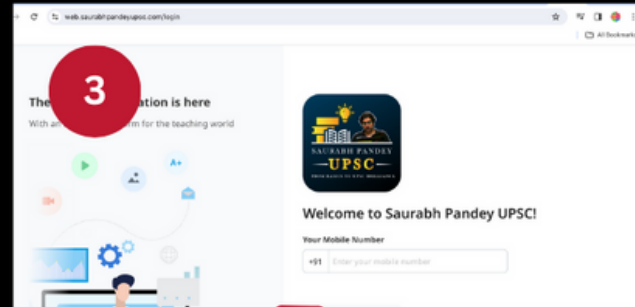
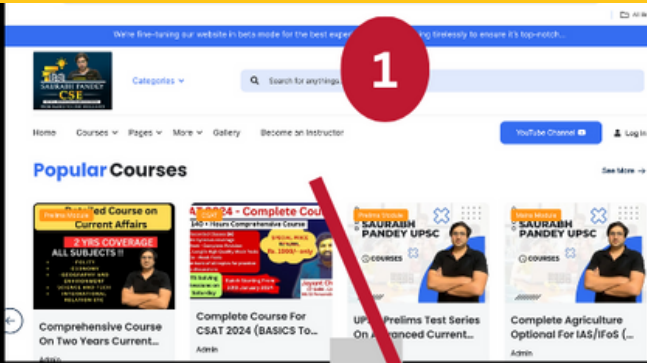
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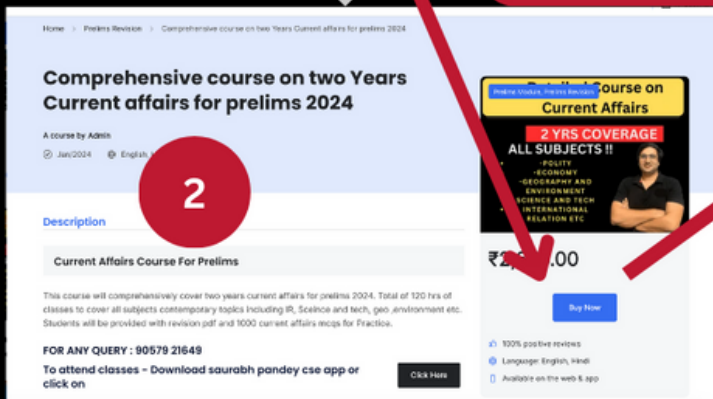
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## ESSAY TOPIC

Q ""Actions do not cling to me because I am not attached to their results. Those who understand this and practice it live in freedom."

प्रश्न "कर्म मुझसे चिपकते नहीं हैं क्योंकि मैं उनके परिणामों से जुड़ा नहीं हूँ। जो लोग इसे समझते हैं और इसका अभ्यास करते हैं वे स्वतंत्रता में रहते हैं।"

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