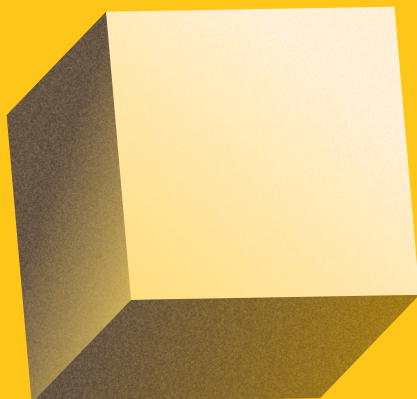


THE HINDU ANALYSIS

25th March 2024
by saurabh pandey



Q.

Water diplomacy is way forward in maintaining relationship between countries in the era of Anthropocene. Discuss (250 words)

Ans.

Anthropocene era means the bad impact on the Earth's ecosystem by human activities. By these activities we have depleted the finite water resource drastically as well. Factors contributing to the continuous depletion of water includes both physical and economic ones, such as - rapid urbanization, industrialization, unsustainable agricultural practices, erratic rainfall pattern, climate change, pollution, inadequate water management approaches etc.

Why concerning?

- * Acc. to 'World Resource Institute's' data - nearly 17 countries comes under extremely high water stress crisis.
- * India is also not an exception to this problem, falls under the water stressed nation, with its water capacity expected to reduce from 1341 m^3 by 2025 and 1140 m^3 by 2050.

Reasons behind water depletion :-

- (i) Water table going down due to increased tubewell / borewell density.
(more discharge of ground water than its recharge)
- (ii) Dumping of sewage and other grey waters directly into rivers resulting in lowering down the quality of water.
- (iii) Reduced storage of water (rain) in reservoir / wetlands / waterbodies due to piling of silt.

Currently the world is experiencing countless meteorological extremities ranging from intense heat waves to turbulent floods, which increases water insecurity ^{by} many folds.

To overcome this problem, the world order needs to foster improved cooperation via water diplomacy, as - Out of UNESCO's 194 state member & 12 associate members, 153 countries can be classified as water-sharing nations.

Role of Water Diplomacy

- * By using water diplomacy among nations, will help in fostering improved resource sharing.
- * Following and framing of new universal

principles for international water law.

- * Keeping in mind the intricate relation b/w water, climate change and international stability, a collaborative governance is required for effective and equitable water sharing among nations.
- * Inclusion of research, academia and industry to implement & deploy of new technologies.
- * Extensive cross border networks with civil societies and academic networks for facilitating political ~~processes~~ processes to prevent, mitigate & resolve water related disputes.

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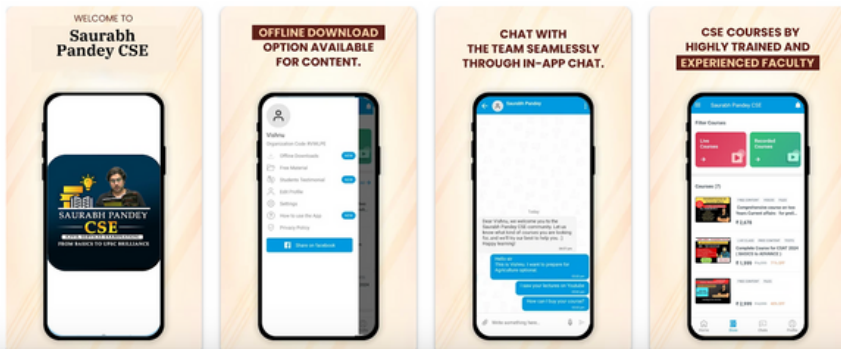
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The image shows a screenshot of the website saurabhpandeyupsc.com. At the top, there is a navigation bar with a logo for 'SAURABH PANDEY CSE' and a search bar. Below the navigation bar, there are menu items: Home, Courses, Pages, More, About UPSC Exam, Current-Affairs Pointers, and Join Us. A 'Get Started' button is also visible. The main content area is titled 'Popular Courses' and features four course cards:

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- International Relations (Basic And Current...)**: A Prelims Module course, LAUNCHED, for Target Prelims 2024. It covers 'Basics and current affairs' and 'International Relations'. BY Saurabh pandey sir.
- Science And Technology For Prelims (Basic +...)**: A Prelims Module course, Launched, for Target Prelims 2024. It is a 'Course on Advance Topics of Science & technology'. Topics from last 2 yrs, Special focus on Newspapers especially the hindu. BY Saurabh pandey sir.
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Can 'good sounds' help coral islands recover from bleaching?

Many coral islands, like Lakshadweep, are inhabited by people and their destruction will naturally affect the people there. Rising seas due to climate change is another problem: many island countries like Tuvalu and Vanuatu are facing the threat of submergence and have articulated their concerns at international climate conferences

V. Sasi Kumar

Climate change is the most serious environmental problem facing the world today. One of the main reasons for this is the global warming caused by the extraction of coal and oil, which have been underground for millennia, and burning them for industrial and non-industrial purposes to generate energy. The effects of these activities were exacerbated by other causes of global warming, such as deforestation.

Global warming has many consequences, including rising sea levels and changes in the frequency of extreme weather. Another is the destruction of coral reefs. India's Lakshadweep islands for instance are islands formed on such reefs.

Coral reefs have started to die

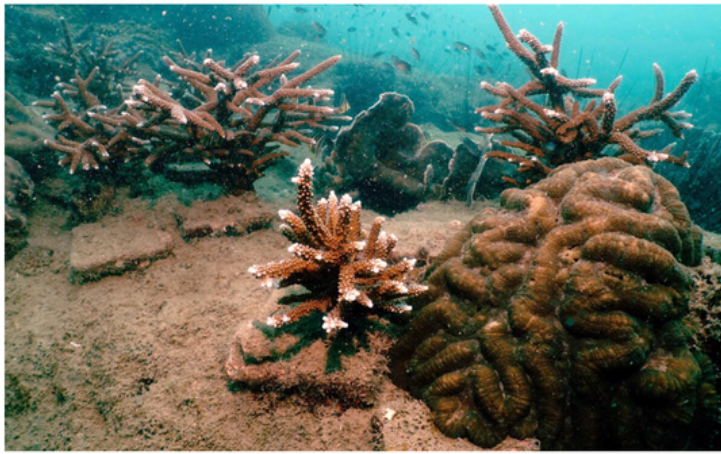
Coral reefs are built by a type of organism that, when it accumulates, forms reefs and islands. They live in large colonies. Corals have a symbiotic relationship with microscopic algae called zooxanthellae, which live in the corals' tissues. Life becomes tough when the temperature of the water around them rises. When it does, the corals expel the zooxanthellae. An important visual symptom of these effects is that the colour of the coral reef changes, and subsequently they die off in droves. This event is called bleaching.

However, not all coral bleaching events are due to warm water. Ocean acidification - which is when the pH of the water drops as more carbon dioxide dissolves in it - is another well-known cause. More acidic water reduces the availability of calcium minerals that the corals need to build and repair their exoskeletons.

In many parts of the world, coral reefs have started to die due to global warming experienced over the years. The U.S. lost half of its coral reefs in the Caribbean in one year in 2005 due to a large-scale bleaching event after warm waters around the Virgin Islands and Puerto Rico expanded southward. When scientists collated satellite data of the region from the previous 20 years, they were able to confirm that the 2005 event exerted more thermal stress than those in the previous 20 years combined.

A source of hope

The Great Barrier Reef in Australia is the largest coral reef in the world. Recently many people there protested strongly against a plan to open a new coal mine because they were worried about the survival of the reef - not because the mine would directly affect the reef but because



Staghorn corals seen in the waters off Man Nai Island, near Rayong province, Thailand in February. REUTERS

of the effects of burning fossil fuels at large.

Many coral islands like our Lakshadweep are inhabited by people. The destruction of these coral reefs will naturally affect the people there. A rising sea level due to climate change is another problem for them. Many small island countries like Tuvalu and Vanuatu are facing the threat of submergence and have articulated their concerns at international climate conferences. Their submergence is a certainty now; the only question is when it will happen. Therefore, it is very scary that the coral reefs themselves are being destroyed and, axiomatically, any chance of saving the corals can and does become a source of hope.

It is against this background that about 5,000 scientists gathered in New Orleans, in the U.S., in February this year for the American Geophysical Union's biennial 'Ocean Sciences' meeting. Here, Amy Apprill, a scientist at the Woods Hole Oceanographic Institute in Massachusetts and who studies coral reefs, provided information about a study she had been part of.

The coral polyps

To understand this study, we need to first understand what a coral reef is. Coral reefs are built by an organism called a polyp. A coral group is a colony of a large



Global warming has many consequences, including rising sea levels and changes in the frequency of extreme weather. Another is the destruction of coral reefs

number of genetically identical polyps. Each polyp is a sac-like animal, usually a few millimeters wide and a few centimeters tall. It has a set of tentacles surrounding a mouth-like opening. Polyps are gregarious: they like to socialise.

Every polyp also sheds an exoskeleton at its bottom and over many generations this discarded substance accumulates to form a large structure up to several metres wide. The polyps organise their lives around this structure. A coral reef is formed when a large number of polyps collect in this way. Polyps use sound to communicate with each other. Naturally, the sound of a healthy colony will differ from that of an unhealthy colony. Dr. Apprill and her team used this distinction in their new study.

The sound of a health colony

The investigators set about examining whether a degraded reef could be enriched by replaying healthy reef

sounds. They conducted a series of field studies in the Virgin Islands of the U.S., where they quantified the settlement rates of three species of corals with two different breeding strategies.

They found that in degraded coral reefs, the settlement rate increased when such sounds were played (using a novel underwater speaker system). They also reported that the settlement rate was higher closer to the speaker and reduced as one moved away from the speaker, indicating the impact of the sounds played.

Finally, it would be a mistake to think the researchers have solved the reef settlement problem posed by climate change. Their study was just an experiment. If what they did is tested repeatedly and at least a good fraction of instances are successful, then we can decide that their technique can help in practice. But we still don't know what problems might arise when this project is implemented on a large scale to save coral reefs. We also need to find out the volume at which the sound has to be played and if there are any other parameters to be controlled.

In sum, the new study is just a pointer, even if also a positive one.

(V. Sasi Kumar is a scientist formerly at the Centre for Earth Science Studies, Thiruvananthapuram.)

THE GIST

Corals have a symbiotic relationship with algae called zooxanthellae. When the temperature of water rises, corals expel zooxanthellae. An important visual symptom of these effects is that the colour of the coral reef changes, and they die off. This event is called bleaching.

Coral reefs are dying due to warming. The U.S. lost half its reefs in the Caribbean in one year in 2005 due to a large-scale bleaching event. When data of the region was collated, it confirmed that the 2005 event exerted more thermal stress than those in the previous 20 years combined.

In degraded coral reefs, settlement rate increased when healthy reef sounds were played. The settlement rate was higher closer to the speaker and reduced as one moved away from the speaker, indicating the impact of the sounds played.



The hindu analysis by saurabh pandey sir



Can 'good sounds' help coral islands recover from bleaching?

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CORAL BLEACHING

Have you ever wondered how a coral becomes bleached?

HEALTHY CORAL

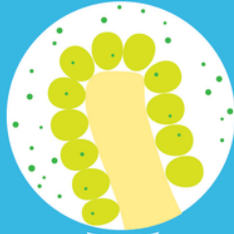
1 Coral and algae depend on each other to survive.



Corals have a symbiotic relationship with microscopic algae called zooxanthellae that live in their tissues. These algae are the coral's primary food source and give them their color.

STRESSED CORAL

2 If stressed, algae leaves the coral.



When the symbiotic relationship becomes stressed due to increased ocean temperature or pollution, the algae leave the coral's tissue.

BLEACHED CORAL

3 Coral is left bleached and vulnerable.



Without the algae, the coral loses its major source of food, turns white or very pale, and is more susceptible to disease.

WHAT CAUSES CORAL BLEACHING?



Change in ocean temperature

Increased ocean temperature caused by climate change is the leading cause of coral bleaching.



Runoff and pollution

Storm generated precipitation can rapidly dilute ocean water and runoff can carry pollutants — these can bleach near-shore corals.



Overexposure to sunlight

When temperatures are high, high solar irradiance contributes to bleaching in shallow-water corals.



Extreme low tides

Exposure to the air during extreme low tides can cause bleaching in shallow corals.



NOAA's Coral Reef Conservation Program
<http://coralreef.noaa.gov/>





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WHAT IS IT?

Abel Prize: a Nobel for mathematicians

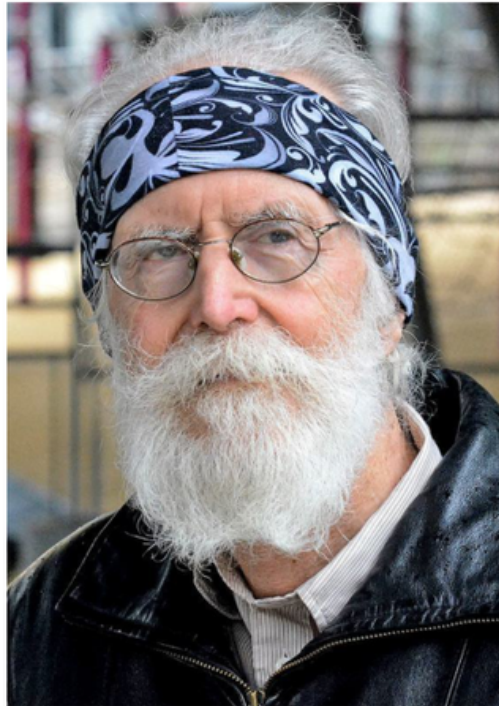
Vasudevan Mukunth

The Abel Prize for 2024 has been awarded to French mathematician Michael Talagrand for “contributions to probability theory and functional analysis, with outstanding applications in mathematical physics and statistics”.

Every year, the King of Norway awards the Abel Prize to at least one scholar who has made a significant contribution to mathematics. The Government of Norway has been presenting the prize since 2003, and has modelled it after the Nobel Prizes, awarded in neighbouring Sweden, including a cash prize of 9 million Norwegian kroner (approximately Rs 7 crore) for the laureates.

This said, the idea for the prize was first floated back in 1899, after the Norwegian mathematician Marius Sophus Lie found out that Alfred Nobel’s will didn’t include a prize for mathematics. The year 1899 was also the birth centenary of Niels Hendrik Abel, a famous Norwegian mathematician after whom the prize came to be named. The Abel Committee selects each year’s winners.

Dr. Talagrand’s work in particular has been credited with “making random processes more predictable,” as one *Nature* article put it. According to his biography on the Abel Prize website, Dr. Talagrand couldn’t see in one eye as the result of a genetic condition. A



French mathematician Michel Talagrand who has won the Abel Prize for Mathematics. He is an expert on probability theory and functional analysis. AFP

decade later, when he developed trouble in his other eye, he became scared and studied hard at school, eventually discovering his knack for mathematics.



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ABEL PRIZE

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BIG SHOT



The Poza de la Becerra, a geological anomaly in the Cuatro Ciénegas wetland in the Chihuahuan Desert, in Mexico. The 170 cactus-ringed pools contain important species of fish, snails, turtles, bacteria, and unique living rock structures that offer important clues to life on the earth millions of years ago. However, water is rapidly draining from the wetland.
REUTERS



The hindu analysis by saurabh pandey sir



The Poza de la Becerra

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On the resurgence of mumps in Kerala

Is Kerala the only State witnessing an alarming increase in the number of mumps cases in children and adolescents? Why have there been many school-based outbreaks in the State? Why has the mumps vaccine been excluded from the Universal Immunisation Programme?

EXPLAINER

C. Maya

The story so far:

Mumps, an acute viral infection which historically affects children, has been spreading like wildfire in Kerala, for the past few months. Not just Kerala, a resurgence in cases was being reported from several States, including Maharashtra, Telangana and Andhra Pradesh as well. Cases which began appearing sporadically around November 2023 in the Malappuram and Kozhikode districts of Kerala, have since then spread to Palakkad and Thrissur too, resulting in major community outbreaks. The case tally this year alone has reached 15,637, as on March 22, with 6,675 cases being reported this month. Such an uncontrolled surge in cases could lead to an increase in the number of complications of mumps, like meningoencephalitis or pancreatitis, public health experts fear.

Is it a cause for concern?

Mumps is a self-limiting, airborne viral disease and presents as fever and headache in mostly children and adolescents, with painful swelling of the salivary glands (parotid glands) on both sides of the face. There is no specific treatment and the patient recovers with rest and symptomatic management in about two weeks. With only half of the infected children developing the classical disease and close to 30% remaining asymptomatic, cases mostly go unreported, indicating that the reported cases are a gross underestimation of the actual cases in the community.

From the view point of public health, measles, which can cause significant morbidity and mortality, has always been considered a priority, rather than mumps. However, with cases being reported in epidemic proportions, several cases arising from the complications of mumps like encephalitis, epilepsy, aseptic



Stop the spread: A vial of the measles, mumps, and rubella virus (MMR) vaccine. REUTERS

meningitis and acute pancreatitis, have been reported at Kozhikode Medical College hospital. The other significant complication brought forth by mumps is the virus's effect on the gonads (reproductive glands) in both males and females. In males, it presents the rare yet distinct possibility of infertility or a drop in sperm count in the long term.

Why is the mumps vaccine not part of the national immunisation schedule? Despite being a vaccine-preventable disease, mumps has never been a part of the Universal Immunisation Programme (UIP) because of the disease's no-mortality profile and the perception that it has low public health significance.

However, the Indian Academy of Paediatrics (IAP) has always maintained that the public health significance of mumps has been underestimated mainly because of the poor documentation of clinical cases, its complications and patients' follow-up data as well as the lack of published studies. There is no nationally representative data on incidence of the disease. There is very little information on the actual long-term morbidity profile of the disease, even though the disease is known to have some impact on reproductive organs.

How can the current outbreaks be controlled? Health officials maintain that creating

public awareness about the disease and the importance of isolation is the most important tool in bringing down the transmission of the disease. Mumps is primarily being reported in un-immunised children and adolescents and hence improving general immunisation cover is important. Transmission of the disease begins before the symptoms actually manifest and isolation of the patient for a full three weeks is necessary to limit the spread of the disease.

Health officials reckon that one of the reasons for the large number of school-based outbreaks in Kerala is because children were allowed back to school as soon as there was symptomatic relief, before the three weeks isolation period was up. They hope that there will be a break in transmission and a drop in new cases once schools close for the summer break.

What should be the strategy ahead?

According to the World Health Organization (WHO), vaccination strategies targeting mumps control should be closely integrated with existing measles elimination and rubella control.

The IAP for one, has always advocated the use of MMR (Mumps-Measles-Rubella) vaccine in UIP, which has been available in the private sector for a long time. There are no studies from India on the effectiveness of the mumps vaccine. But globally, the protection from two doses is estimated to be between 70-95%, if the coverage is high.

In 2014, Kerala, as part of its own initiative to protect children from Rubella, had replaced the second dose of measles vaccination given at 18 months to infants in UIP, with MMR. However, in 2017, when the Centre introduced Rubella vaccine in the UIP, replacing the two doses of measles given at nine months and 15 months with the MR vaccine (Measles-Rubella), Kerala also followed suit. Kerala has now written to the Centre on the mumps resurgence happening in the State and the need to replace MR vaccine in the UIP with MMR vaccine.

THE GIST

Mumps, an acute viral infection which historically affects children, has been spreading like wildfire in Kerala, for the past few months.

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The hindu analysis by saurabh pandey sir



Mumps in Kerala

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What are the new rules for elephant transfers?

What were the provisions regarding the ownership and transfer of elephants earlier? Why do experts and activists say that the law with respect to protecting elephants from trafficking has become lax?

Abhishek Koshy

The story so far:

The Centre has notified a set of rules called the Captive Elephant (Transfer or Transport) Rules, 2024 that realises the conditions under which elephants may be transferred within or between States.

What are the rules around the transfer and transport of elephants?

Elephants are, according to the provisions of the Wildlife Protection Act, a Schedule 1 species and therefore, be it wild or captive, cannot be captured or traded under any circumstances. Section 12 of the Act allows Schedule 1 animals to be translocated for 'special purposes' such as education and scientific research. They can also be translocated for population management of wildlife without harming the wild animal and collection of

specimens for recognised zoos/museums. Captive elephants because of their historical role in forest management, timber transport, presence in estates of erstwhile royal families and in temple precincts for religious purpose can be owned and therefore come under a special category. However, strict rules guide the transfer of such elephants. Section 40 (2) of the Wildlife Protection Act, 1972 prohibits the acquisition, possession and transfer of a captive elephant without the written permission of the Chief Wildlife Warden of the State. Until 2021, however, these laws explicitly said that such transactions ought not to be of a 'commercial nature'. The Environment Ministry in 2021 brought in an amendment that allowed the transfer of elephants for 'religious or any other purposes'. Such a broad interpretation, activists and researchers said, could accelerate trafficking and illegal commercial transactions. A standing

committee, led by former Environment Minister, Jairam Ramesh, opposed this section but it was passed into law.

What do the updated rules say?

These rules provide new relaxations under which captive elephants can change owners or be transferred. These include, for instance, situations when an owner is no longer in a position to maintain the elephant or when a state's Chief Wildlife Warden "deems it fit and proper" to transfer the elephant in circumstances which call for better upkeep of the elephant. Before a transfer within the State, an elephant's health has to be ratified by a veterinarian, and the Deputy Conservator of Forests has to establish that the animal's current habitat and prospective habitats are suitable. The Chief Wildlife Warden on receipt of such documents may choose to reject or approve the transfer.

If the transfer involves moving the

elephant outside of a State, similar conditions apply. Before a transfer is effected, the "genetic profile" of the elephant has to be registered with the Ministry of Environment, Forest and Climate Change. Earlier rules required that an elephant being transferred from say, Assam to Gujarat would need permissions from the Chief Wildlife Wardens of every State that the elephant would pass through in the process of being ferried by road. Now only the originating and recipient States' permissions are required.

What do the updates mean?

The Wildlife Protection Act is essentially a prohibitive law. It puts in a variety of restrictions to curb the trafficking of wild animals. However independent researchers say that with regard to elephants the law has become lax. The establishment of India's largest private zoo in Jamnagar, Gujarat which is affiliated to the Reliance Foundation, has brought some of these questions to the fore. The facility, which is a rescue centre and ostensibly exists to rehabilitate traumatised and injured elephants, among other wildlife, hosts a reported 200 elephants and controversially also hosts "healthy animals," according to a recent journalistic investigation published in the periodical *Himal Southasia*. There are also concerns that some of these elephants aren't captive but sourced from the wild.

THE GIST

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The hindu analysis by saurabh pandey sir



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