

HAVE WE LOST THE FIGHT AGAINST CLIMATE CHANGE?

Context

- Like every year ahead of the COP summit, this year too **many studies and reports have been released in the past month** to assess where the world stands in the fight against climate change.
- And just like every previous year, this year the situation appears grimmer, and **the progress more marginal, than earlier.**

Has the World Lost Against Climate Change?

- **The Fight is Over for 2030 Emission Reducing Targets**
 - If it is about meeting 2030 emission reduction targets, consistent with 1.5 or even 2-degree Celsius pathways, the fight is as good as over.
 - Governments, international bodies, and even scientists, **would like to focus on the theoretical possibilities that are still open.**
 - However, it is **extremely improbable that these targets would be met. Even historically, no climate target has ever been met.**
 - As mentioned in the **Emissions Gap Report**, there have been **86 days already this year when daily temperatures exceeded pre-industrial averages** by more than 1.5 degree Celsius.
 - And now, **at least two days have been more than 2 degrees warmer.**
 - **The year 2023 is set to emerge as the warmest ever, surpassing the record of 2016**, and it would not be surprising if it breaches the 1.5-degree threshold for the annual average.
 - According to a World Meteorological Organisation assessment, **it is almost certain that this threshold would be breached in the next four years.**
- **Yet, There Are Possibilities of a Pull-Back**

- There are still possibilities of a pull-back **through technological interventions like carbon dioxide removal**, though these technologies are far from becoming mainstream and economical.
- **But every climate scenario beyond 2040 relies heavily on these technologies to reduce the concentrations of greenhouse gases** in the atmosphere and bring down temperatures rapidly.

Conclusion

- **Recent developments** such as spike in global warming, ineffective response, and the resultant increase in weather-related disasters **suggest that climate change might already be a lost cause, at least as far as meeting the targets the world has set for itself is concerned.**
- Eventually, **countries would learn to minimise loss of lives in disasters, at least from the predictable events, but there would be more frequent disruptions** and the poor and the weak would suffer the most.
- But adversity can induce resilience in populations, therefore **talks of extinction of the human race or an end to life on the planet might be vastly exaggerated.**

GAMBUSIA FISH

Recently, various government and non-governmental organisations in Andhra Pradesh, Odisha, and Punjab have released Gambusia fish into local water bodies to address a mosquito menace.



About Gambusia fish:

- It is known as **mosquitofish** and, is widely used as a biological agent for controlling mosquito larvae.
- It is **native to** the waters of **the south-eastern United States.**
- It has been a part of mosquito-control strategies for over a century in various parts of the world, including India.
- A single full-grown fish eats about 100 to 300 mosquito larvae per day.

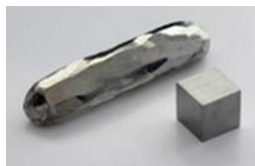
- Also, it has been part of **various malaria control strategies** in India since 1928, including the Urban Malaria Scheme.
- The International Union for Conservation of Nature (IUCN) declares Gambusia one of the 100 worst **invasive alien species in the world**.

Key points about Malaria

- It is a disease caused by the **Plasmodium parasite**.
- The parasite can be spread to humans through the **bites of infected mosquitoes**.
- **Transmission**
 - The plasmodium parasite is spread by **female Anopheles mosquitoes**, which are known as "night-biting" mosquitoes because they most commonly bite between dusk and dawn.
 - Only five types of parasites cause malaria in humans.
 - **Plasmodium falciparum**– It is mainly found in Africa; it's the most common type of malaria parasite and is responsible for most malaria deaths worldwide.
 - **Plasmodium vivax**– It is mainly found in Asia and South America, this parasite causes milder symptoms than Plasmodium falciparum, but it can stay in the liver for up to 3 years, which can result in relapses.
 - **Plasmodium ovale** – fairly uncommon and usually found in West Africa, it can remain in the human liver for several years without producing symptoms.
 - **Plasmodium malariae** – It is only found in Africa.
 - **Plasmodium knowlesi** – It is very rare and found in parts of Southeast Asia.

WHAT IS TANTALUM?

Recently, a team of researchers from the Indian Institute of Technology (IIT), Ropar, found the presence of tantalum, a rare metal, in the Sutlej river sand in Punjab.



About Tantalum:

- It is a rare metal with the **atomic number 73**—the number of protons found in one atom of the element.

- The rare metal has been named after a Greek mythological figure, Tantalus.
- **Properties**
 - It's **grey, heavy, very hard**, and one of the **most corrosion-resistant metals** in use today.
 - It possesses high corrosion resistance because, when exposed to air, it **forms an oxide layer** that is extremely difficult to remove, even when it interacts with strong and hot acid environments.
 - When pure, **tantalum is ductile**, meaning it can be stretched, pulled, or drawn into a thin wire or thread without breaking.
 - It is almost **completely immune to chemical attack** at temperatures below 150°C and is attacked only by hydrofluoric acid, acidic solutions containing the fluoride ion, and free sulphur trioxide."
 - It also has an extremely **high melting point**, exceeded only by tungsten and rhenium.
 - When it is placed in the midst of acids, it is incapable of taking any of them up.
- **Applications**
 - It is most prominently used in the **electronic sector**.
 - The capacitors made from tantalum are capable of storing more electricity in smaller sizes without much leakage than any other type of capacitor.
 - This makes them ideal for use in portable electronic devices such as smartphones, laptops, and digital cameras.
 - As tantalum has a high melting point, it is frequently used as a substitute for platinum, which is more expensive.
 - The rare metal is also used to **make components for chemical plants**, nuclear power plants, aeroplanes and missiles.
 - It does not react with bodily fluids and is used to **make surgical equipment** and implants, like artificial joints
 - A composite consisting of **tantalum carbide (TaC)** and graphite is one of the hardest materials known and is used on the **cutting edges of high-speed machine tools**.

EXERCISE VAJRA PRAHAR

Recently, the Indo-US Joint Special Forces exercise “VAJRA PRAHAR 2023” commenced at the Joint Training Node, Umroi, Meghalaya.



About Exercise VAJRA PRAHAR

- It is a joint exercise conducted between the **Indian Army and the US Army Special Forces**.

- It aims at sharing best practises and experiences in areas such as joint mission planning and operational tactics.
- It is the **14th Edition** of the Indo-US Joint Special Forces exercise “VAJRA PRAHAR 2023,” which commenced at the Joint Training Node, Umroi
- The US contingent is represented by personnel from the 1st Special Forces Group (SFG) of the US Special Forces. The Indian Army contingent is led by Special Forces personnel from the **Eastern Command**.
- The **first edition** was conducted in **2010** in India, and the 13th edition of the Indo-US Joint Special Forces exercise was conducted at the Special Forces Training School (SFTS), Bakloh (HP).
- The current edition is being conducted in Umroi Cantonment, Meghalaya from 21st November to 11th December 2023.
- It is also a platform to enhance inter-operability and strengthen defence cooperation between the armies of India and the United States of America.

SATHEE (SELF ASSESSMENT TEST AND HELP FOR ENTRANCE EXAMS) PORTAL

The Ministry of Education (MoE) recently said they would write to all states to encourage aspirants to utilise the newly launched portal for exam preparation, SATHEE (Self Assessment Test and Help for Entrance Exams).



About the SATHEE (Self Assessment Test and Help for Entrance Exams) Portal:

- It is a new initiative by the Ministry of Education to provide a free learning and assessment platform for students.
- It will help students gain access to training and coaching for competitive examinations for free.
- The platform aims to bridge the gap for students in society who are not able to afford the costly entrance exam guidance and coaching.
- It will have preparation materials for students in English, Hindi, and other regional languages of India so that students can prepare for exams like JEE and NEET.
- It will be useful for candidates who will be preparing for CAT, GATE, UPSC, etc. It will also allow candidates to gain experience in coaching centres.
- The platform will have videos made by the faculty members of IITs and IISC to help students prepare for the competitive examinations. The videos would also help students learn concepts and revise topics they are weak at.
- It makes use of an indigenously developed AI programme called Prutor, which was developed by IIT-Kanpur.
- **SATHEE Features:**
 - Preparation material for entrance exams, including JEE and NEET
 - Video solutions in regional languages for entrance exams
 - JEE and NEET entrance exam preparation ideas webinars
 - Students' stories of struggles and achievement
 - Solve with me sessions
 - Motivational sessions

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA (CITES)

Trade in precious timber and sharks and conservation of elephants and big cats were among the many critical matters reviewed during the 77th Meeting of the Standing Committee (SC77) of the CITES in Geneva recently.

About the Convention on International Trade in Endangered Species of Wild Fauna and



Flora (CITES):

- It is an international agreement between governments that aims to ensure that international trade in wild animals and plants does not threaten their survival.
- CITES was adopted in 1973 and entered into force in 1975.
- There are 184 member parties, and trade is regulated in more than 38,000 species.
- Although CITES is legally binding on the Parties– in other words, they have to implement the Convention–it does not take the place of national laws.
- The CITES Secretariat is administered by the United Nations Environment Programme (UNEP) and is located in Geneva, Switzerland.
- Representatives of CITES nations meet every two to three years at a Conference of the Parties (or COP) to review progress and adjust the lists of protected species, which are grouped into three categories with different levels of protection:
 - **Appendix I:**
 - It includes species threatened with extinction and provides the greatest level of protection, including a prohibition on commercial trade.
 - **Appendix II:**
 - It includes species that are not currently threatened with extinction but may become so without trade controls.
 - Regulated trade is allowed if the exporting country issues a permit based on findings that the specimens were legally acquired and the trade will not be detrimental to the survival of the species or its role in the ecosystem.
 - **Appendix III:**
 - It includes species for which a country has asked other CITES parties to help control international trade.

- Trade in Appendix III species is **regulated using CITES export permits** (issued by the country that listed the species in Appendix III) **and certificates of origin** (issued by all other countries).
- **Countries may list species** for which they have domestic regulations in **Appendix III at any time.**
- **CITES also brings together law enforcement officers** from wildlife authorities, **national parks, customs, and police agencies to collaborate** on efforts to combat wildlife crime targeted at animals such as elephants and rhinos.

WHAT IS AIRGLOW?

NASA recently shared a picture taken from the International Space Station showing the Earth's airglow outlining the planet's horizon with the Moon above.



About Airglow:

- Airglow is the **natural “glowing” of the Earth’s atmosphere.**
- **It happens all the time and across the whole globe.**
- The phenomenon is **similar to auroras, but where auroras are driven by high-energy particles originating from the solar wind, airglow is energized by ordinary, day-to-day solar radiation.**
- **Unlike the aurora, airglow does not exhibit structures such as arcs and is emitted from the entire sky at all latitudes at all times.**
- There are **three types of airglow: dayglow, twilightglow, and nightglow.**
- Each is the result of sunlight interacting with the molecules in the atmosphere, **but they have their own special way of forming.**
- The most **common airglow colors are green, red, and blue.** However, other colors also occur.

Dayglow:

- It forms **when sunlight strikes the daytime atmosphere.**

- **Some of the sunlight is absorbed by the molecules in the atmosphere, which gives them excess energy. They become excited.**
- **The molecules then release this energy as light, either at the same or slightly lower frequency (colour) as the light they absorbed. This light is much dimmer than daylight, so we can't see it by eye.**

Twilight glow:

- **It is essentially the same as dayglow, but only the upper atmosphere is sunlit.**
- **The rest of the atmosphere and the observer on the ground are in darkness.**
- **So, unlike day glow, twilight glow is actually visible to us on the ground with the naked eye.**

Nightglow:

- **The chemistry behind Nightglow is different. There is no sunlight shining on the nighttime atmosphere. Instead, a process called “chemiluminescence” is responsible for the glowing atmosphere.**
- **Sunlight deposits energy into the atmosphere during the day, some of which is transferred to oxygen molecules (e.g. O₂).**
- **This extra energy causes the oxygen molecules to rip apart into individual oxygen atoms. This happens particularly around 100km in altitude.**
- **However, atomic oxygen isn't able to get rid of this excess energy easily, so it acts as a “store” of energy for several hours.**
- **Eventually, the atomic oxygen does manage to “recombine”, once again forming molecular oxygen. The molecular oxygen then releases energy, again in the form of light.**