

### Earning post pandemic

There has been a rise in the proportion of women working as unpaid family helpers, with the share of rural working women in this form of employment rising from 37.9% to 43% between 2018-19 and 2022-23.

Between 2019 and 2023, only casual workers both men and women, across both rural and urban sectors saw a net increase in their average real monthly earnings.

Wage workers as a whole have seen real earnings grow slower than output, indicating a reduction in the share of wages even though growth remains healthy.

The Hindu

### Bat immunity

Bats are extraordinary organisms in many ways.

They are the only mammals on the earth that can maintain sustained flight.

They also have relatively long lifespans and are relatively more protected from a variety of diseases, including cancer.

They also have a unique ability in echolocation, whereby they use sound to navigate and locate objects, freeing them from being constrained by the availability of light like humans are.

By population, bats make up 20% of all mammals

There are more than 1,400 species of bats today around the world; more than 60 are endangered and 170 odd are classified as vulnerable.

The bumblebee bat weighs only 2 grams whereas the flying foxes, which have a wingspan of 1.5 metres, weigh up to 1.6 kg.

## Current Affairs 23<sup>rd</sup> October 2023 by Saurabh Pandey

In all, bats play crucial roles in maintaining the ecological balance, and are essential for pollination, insect control, et

Bats do host a wide variety of pathogens, including ones deadly to other mammals, but they themselves don't get infected.

One watershed moment came in 2013. In a paper published in the journal Science, scientists compared the genomes of a fruit eating and an insect eating species and found that genes involved in metabolism and immune response had been positively selected.

The ambitious Bat1K global genome consortium to sequence all the 1,400 or so species' genomes is also currently underway.

Emerging evidence also suggests that a set of immune related genes have been undergoing positive selection in

bats, adapting them to control the spread of viruses while mitigating the antiviral inflammatory response

One of the first Bat1K genome consortium papers described six high quality bat species genomes in the journal Nature.

It suggested that echolocation, loss of pro inflammatory genes, and expansion of antiviral genes are ancestral traits of bats.

This suggests that bats have molecular mechanisms that allow them to host a range of deadly viruses but evade clinical disease

Long read sequencing technologies are those that can 'read' thousands to tens of thousands of bases of a genome at a time.

With their advent, it has become possible today for scientists to quickly assemble the nearly complete whole genomes of organisms.

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Another benefit to them is that they no longer had to use more complex, time consuming, and expensive molecular technologies in the pursuit of building complete genomes

The researchers reported that subsets of genes involved in mounting an immune response which encode proteins called interferons (IFN) had contracted significantly.

This in turn changed the relative proportions of two subsets, interferon alpha ( $IFN\alpha$ ) and interferon omega ( $IFN\omega$ ), relative to each other.

The researchers attributed bats' immune properties to these changes. By shedding the genes for  $IFN\alpha$ , bats can dampen the pro inflammatory response against a number of viruses, thus protecting themselves from clinical disease.

The Hindu

## Fluorescence

Matter and radiation interact in a variety of ways.

The sky is blue because air molecules scatter light, and they scatter light of shorter wavelengths more strongly.

Since blue light has the shortest wavelength (in the visible spectrum), it is scattered the most and the sky appears blue. This is called Rayleigh scattering.

But clouds are white because of Mie scattering, which is due to light scattered by larger particles like water droplets.

Another form of interaction is fluorescence when an object absorbs some light of higher energy (like blue colour) and releases it at lower energy (like red colour).

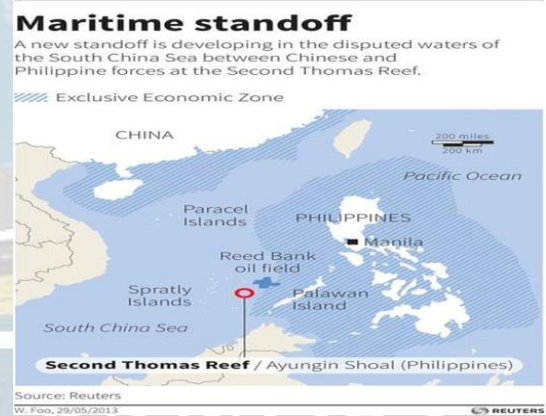
It usually happens when an electron absorbs a photon, or a particle of light, jumps to a higher energy level, before releasing that energy and jumping back down.

The Hindu

### Second Thomas Shoal

Beijing and Manila traded blame on Sunday for two collisions between Chinese vessels and Philippine boats on a resupply mission to Filipino troops on a remote outpost in the disputed South China Sea.

The incidents happened near Second Thomas Shoal in the Spratly Islands, a hotly contested region where Beijing deploys ships to assert its claims over almost the entire sea.



The Hindu

## TVD1

### Mission Definition

**“In-flight Abort Demonstration of Crew Escape System (CES)” at Mach number 1.2 with the newly developed Test Vehicle followed by Crew Module separation & safe recovery.**

### Mission Objectives:

**Flight demonstration and evaluation of Test Vehicle sub systems.  
Flight demonstration and evaluation of Crew Escape System including various separation systems.  
Crew Module characteristics & deceleration systems demonstration at higher altitude & its recovery**

### Mission Highlights

TV Mission Pilbox	<ul style="list-style-type: none"><li>• Mach 1.2</li><li>• Altitude 11.7 km</li><li>• Flight path angle 60°</li><li>• Dynamic Pressure 22.6 kPa</li></ul>
CM-CES separation	<ul style="list-style-type: none"><li>• Mach 0.5</li><li>• Altitude 17 km</li><li>• Dynamic pressure 2-3 kPa</li></ul>
Drogue Parachute deployment	<ul style="list-style-type: none"><li>• Altitude 16.7 km</li></ul>
Main Parachute	<ul style="list-style-type: none"><li>• Altitude - 2.5 km</li></ul>

### TV-D1 Vehicle:

The Liquid propelled single stage Test Vehicle uses a modified VIKAS engine with Crew Module (CM) and Crew Escape System (CES) mounted at its fore end.

### ‘Global Tax Evasion Report 2024

Pointing out that tax evasion is enabling billionaires to enjoy effective tax rates equivalent to 0% to 0.5% of their wealth, the European Union Tax Observatory in its ‘Global Tax Evasion Report 2024’ has called for a global minimum tax on billionaires equal to 2% of their wealth.

This would both address evasion and “generate nearly \$250 billion from less than 3,000 individuals”, the report stated.

## Health of Himalaya

'Carrying Capacity in the IHR'  
circulated on January 30, 2020.

The Hindu

In technical terms, carrying capacity of a region is based on the maximum population size that an ecosystem or environment can sustainably support over a specific period without causing significant degradation or harm to its natural resources and overall health. It is crucial in understanding and managing the balance between human activities and the preservation of natural ecosystems to ensure long term sustainability.

There have been initiatives by the Union government regarding overall development in the IHR.

Some of them are the National Mission for Sustaining the Himalayan Ecosystem (2010), the Indian Himalayas Climate Adaptation Programme, Secure Himalaya Project, and the recent guidelines on