



## Swiss Women Climate Change Case

[Source: IE](#)

### Why in News?

The recent ruling by the **European Court of Human Rights (ECHR)** in favour of a group of Swiss women has significant implications for [climate change](#) litigation.

### What was the Swiss Women Climate Change Case?

- **Petitioners:** The case was brought against the Swiss government by **KlimaSeniorinnen Schweiz (Association of Senior Women for Climate Protection Switzerland)**, a group of women climate activists all above the age of 64.
- **Claim:** The women argued that the **Swiss government's inadequate climate policies violate their right to life** and other guarantees under the **European Convention on Human Rights**.
- **Medical Vulnerability:** The petitioners highlighted their medical vulnerability as senior citizens to [extreme heat caused by climate change](#).
  - Reports by the [Intergovernmental Panel on Climate Change \(IPCC\)](#) show that the Swiss population of senior women, especially those **over 75 are more prone to heat-related medical problems** like 'dehydration, hyperthermia, fatigue, loss of consciousness, heat cramps and heat strokes.
- **Court's Verdict:**
  - The ECHR noted that individuals have the right to effective protection from the serious adverse effects of climate change on their lives, health, well-being, and quality of life under **Article 8 of the convention**.
    - Article 8 of the Convention of Human Rights **includes the right for individuals to be protected by the state from the serious effects of climate change** on their lives.
  - The court found that the **Swiss government had not enacted adequate laws** to combat climate change impacts and failed to meet [greenhouse gas \(GHG\) emission goals](#).
- **Significance of Ruling:**
  - The **ECHR's verdict applies to 46 member states, including all European Union countries, plus the United Kingdom (UK) and various other non-EU countries**.
    - Climate and human rights cases in European courts must now heed ECHR's judgement, potentially spurring similar filings across member countries.
  - The global rise in climate litigation saw 2,180 cases filed by 2022, increasing from 884 in 2017 and 1,550 in 2020, according to the **Global Climate Litigation Report: 2023 Status Review**.
    - This trend could spur further accountability, with judgments potentially impacting climate litigation worldwide.
  - The ruling emphasises the need to align policies with climate science.

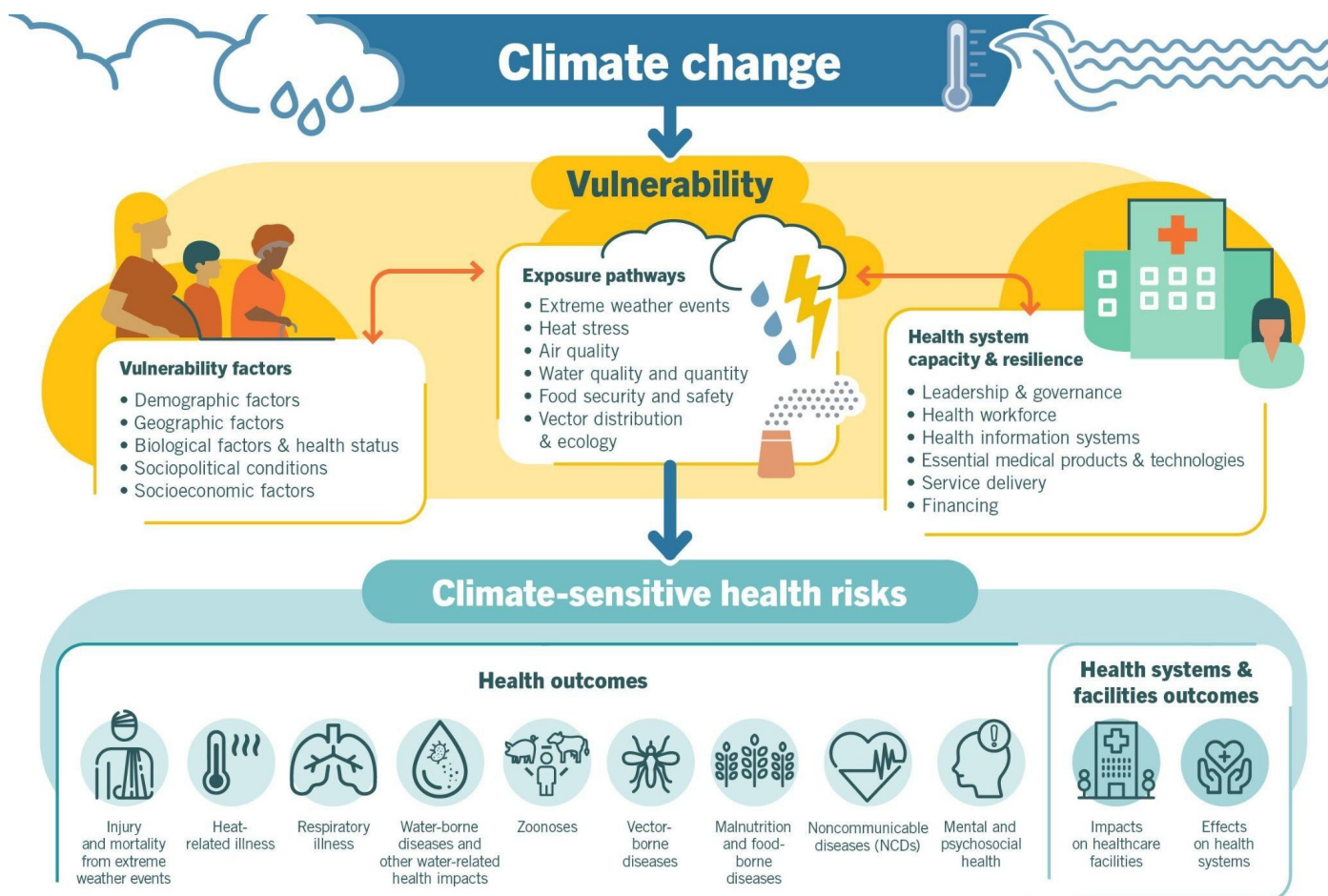
### Similar Cases

- In 2017, a 9-year-old girl from Uttarakhand filed a case in India, arguing that the **country's environmental laws and climate policies require greater action** to address climate change. However, her petition was ultimately rejected.
- In August 2023, Montana youths won a case against the state government, which **neglected**

climate change while approving [fossil fuel projects](#), violating their constitutional right to a clean environment.

## Protection Rights in India against Climate Change Impact

- The Indian Supreme Court broadened the scope of [Articles 14 \(right to equality\)](#) and [21 \(protection of life and personal liberty\)](#), stating that **people have the right to be free from the adverse effects of climate change.**



## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### **Prelims**

**Q. With reference to the 'Global Climate Change Alliance', which of the following statements is/are correct? (2017)**

1. It is an initiative of the European Union.
2. It provides technical and financial support to targeted developing countries to integrate climate change into their development policies and budgets.
3. It is coordinated by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Select the correct answer using the code given below:

(a) 1 and 2 only

(b) 3 only

(c) 2 and 3 only

(d) 1, 2 and 3

Ans: (a)

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## POEM-3 Mission and Space Debris

**For Prelims:** ISRO's PSLV-C58/XPoSat Mission, PSLV Orbital Experimental Module-3, [Vikram Sarabhai Space Centre](#), PSLV-C53 mission, [Low earth orbit](#), [Project NETRA](#), Space Situational Awareness Control Centre.

**For Mains:** POEM Mission, Initiatives Around the World Related to Space Debris.

[Source: TH](#)

### Why in News?

Recently, ISRO's [PSLV-C58/XPoSat mission](#) achieved **near-zero debris** in Earth's orbit by converting the final stage into the [PSLV Orbital Experimental Module-3 \(POEM-3\)](#), which then safely re-entered the atmosphere rather than remaining in orbit after completing its mission.

### What is POEM?

- POEM is an innovative space platform developed by the [Vikram Sarabhai Space Centre \(VSSC\)](#).
  - It repurposes the **fourth stage of a PSLV rocket** into a stable orbital station for conducting in-space scientific experiments with diverse payloads.
  - Its inaugural use occurred during the **PSLV-C53 mission in June 2022**.
    - Normally, the fourth stage of the PSLV becomes space debris after deploying satellites, but in the PSLV-C53 mission, it served as a stabilised platform for experiments.
  - According to ISRO, POEM has a dedicated [Navigation Guidance and Control \(NGC\) system](#) for attitude stabilisation, which stands for controlling the orientation of any aerospace vehicle within permitted limits.
- **POEM-3 Mission:** It was launched as part of the [PSLV C-58 mission](#) on 1<sup>st</sup> January 2024.
  - After deploying the XpoSat satellite, the fourth stage was transformed into POEM-3 and **lowered to a 350-km orbit**, significantly reducing the risk of space debris generation.

**Note:** ISRO first demonstrated the capability of using **PS4** (fourth stage of PSLV) as an orbital platform in 2019 with the **PSLV-C44 mission** that injected **Microsat-R** and **Kalamsat-V2 satellites** into their designated orbits. The **fourth stage in that mission was kept alive as an orbital platform for space-based experiments**.

## What is Space Debris?

- **About:** Space debris in the [low earth orbit \(LEO\)](#) mainly comprises pieces of **spacecraft, rockets, and defunct satellites**, and the fragments of objects that have deteriorated explosively as a result of anti-satellite missile tests.
  - The **LEO extends from 100 km above the earth's surface up to 2000 km above.**
  - Debris also exists, but in smaller volumes, in the geosynchronous orbit (GEO), which is 36,000 km above the earth's surface.
- **Risk:** Space debris often flies around at high speeds of up to **27,000 kilometres** per hour. Due to their sheer volume and momentum, they **pose a risk to several space assets.**
  - It also leads to two major risks, it creates unusable regions of the orbit due to excessive debris, and leads to the '[Kessler syndrome](#) (creation of more debris due to cascading collisions resulting from one collision).
  - The **number of space objects** (debris or functional equipment) greater than 10 cm in size **in LEO is expected to be about 60,000 by 2030**, per ISRO estimates.
    - The rise of private space agencies is exacerbating the problem.
- **Current Status:** According to **ISRO's Space Situational Assessment Report 2022**, the world placed 2,533 objects in space in 179 launches in 2022 alone.
  - In 2022, three major on-orbit break-up events occurred, contributing to most of the debris created that year:
    - **March 2022:** Intentional destruction of **Russia's Cosmos 1048** in an anti-satellite test.
    - **July 2022:** Break-up of the upper stage of **Japanese H-2A** while deploying the GOSAT-2 satellite.
    - **November 2022:** Accidental explosion of the upper stage of **China's Yunhai-3.**
  - **Other Related Events:**
    - NASA has recently confirmed that a mysterious object, which crashed into a home in Florida, was debris from the **International Space Station (ISS).**
    - In 2023, an object discovered on the Western Shores of Australia was identified as debris from an ISRO rocket.
- **Related International Space Laws:** Currently, there are **no international space laws** about LEO debris.
  - However, most space-exploring nations abide by the **Space Debris Mitigation Guidelines 2002** specified by the **Inter-Agency Space Debris Coordination Committee (IADC)**, which the UN endorsed in 2007.
    - The guidelines outline methods to limit accidental collisions in orbit, break-ups during operations, intentional destruction, and post-mission break-ups.

**Note:** The Inter-Agency Space Debris Coordination Committee is an international governmental **forum for the worldwide coordination of activities** related to the issues of man-made and natural debris in space. **ISRO is a member agency.**

# THE GROWING PROBLEM OF SPACE DEBRIS

EARTH

## Debris in Low Earth Orbit

- 10 cm and Larger = 20,000+ objects
- 1-10 cm = 500,000 objects
- Under 1 cm = over 10 million untrackable objects

## Tracking and Speed

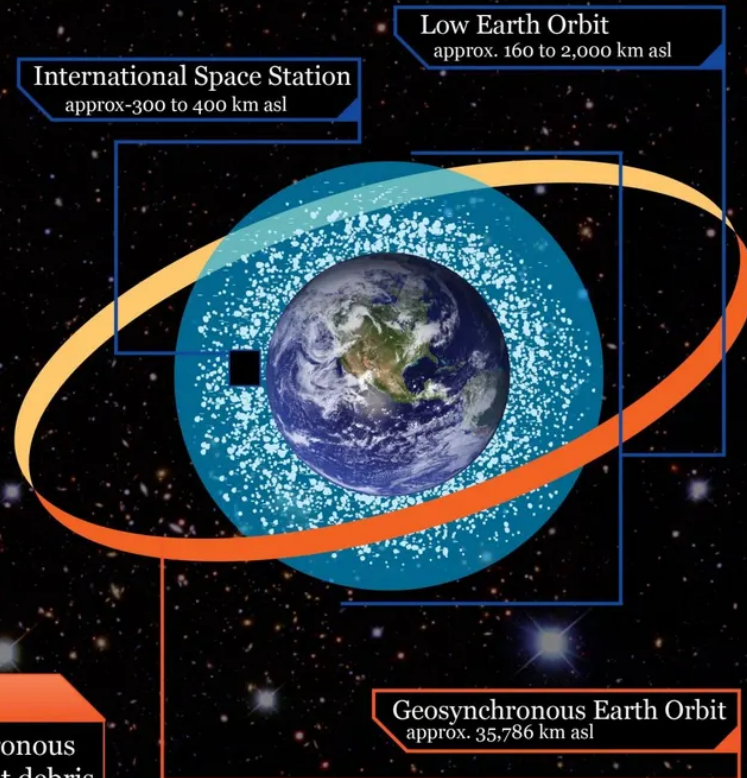
- Most debris is tracked using radar by the US Department of Defense.
- Orbiting debris moving over 28,000 kph. (23 times the speed of sound)

## Potential Damage

At high speeds, even paint flecks can cause serious damage to satellites, spacecraft and the ISS. Every collision creates more debris, producing a cascading problem.

## GEO and the larger problem

The world depends on satellites in geosynchronous Earth orbit for communications and GPS. But debris is largely untrackable at this orbit, meaning that cascading collisions could make it unusable.



## How are Countries Worldwide Dealing with the Problem of Space Debris?

- **India:** India is actively addressing space debris issues. Besides POEM missions, ISRO established a [Space Situational Awareness Control Centre](#) to safeguard valuable assets from collisions.
  - [Project NETRA](#) is also an **early warning system in space to detect debris** and other hazards to Indian satellites.
  - **Manastu Space**, an Indian startup, focuses on in-space refuelling, satellite de-orbiting, and extending satellite lifespan.
- **Japan:** Japan has a project, called the **Commercial Removal of Debris Demonstration (CRD2)**, to tackle space junk.
- **Europe:** The European Space Agency (ESA) has adopted a '**Zero Debris charter**,' which includes multiple ways to mitigate space debris. It has also called for **zero space debris by 2030**.
- **USA:** NASA had instituted its **Orbital Debris Program in 1979** to find ways to create less orbital debris and design equipment to track and remove existing debris.
  - Sixth U.S. Armed Forces wing, called the [Space Force](#), tracks space debris and collisions in LEO.

## Way Forward

- **Space-Based Recycling and Repurposing:** Developing technologies to collect and process space debris in orbit.
  - These "**space refineries**" could break down debris into usable materials for constructing new spacecraft or habitats in space, reducing the need for new launches from Earth.

- Techniques like **3D printing could utilise recycled materials**, minimising the amount of raw materials we launch into space.
- **Robotic Arms and Capture Mechanisms:** Developing advanced robotic arms equipped with cameras and sensors for **grappling with debris**. These robots could be deployed from service satellites to **capture and deorbit large pieces of debris** that pose a significant collision risk.
  - **Docking mechanisms** could be installed on satellites during manufacturing, allowing service satellites to easily attach and deorbit defunct satellites.
- **Space Traffic Management Systems:** Developing sophisticated **space traffic management systems** to track debris and predict potential collisions.
  - This would allow active satellites to perform manoeuvres to avoid debris, reducing the risk of accidental collisions that create even more debris.
  - International collaboration is key for creating a **comprehensive space traffic management system** that ensures the safety and sustainability of space exploration.

### ***Drishti Mains Question***

Q. In light of the growing threat of space debris, discuss innovative strategies and technologies that can effectively mitigate this global concern. How can international collaboration play a crucial role in addressing this issue?

### **UPSC Civil Services Examination, Previous Year Question (PYQ)**

Q. International civil aviation laws provide all countries complete and exclusive sovereignty over the airspace above their territory. What do you understand by 'airspace'? What are the implications of these laws on the space above this airspace? Discuss the challenges which this poses and suggest ways to contain the threat. (2014)

## **Prostate Cancer**

[Source: IE](#)

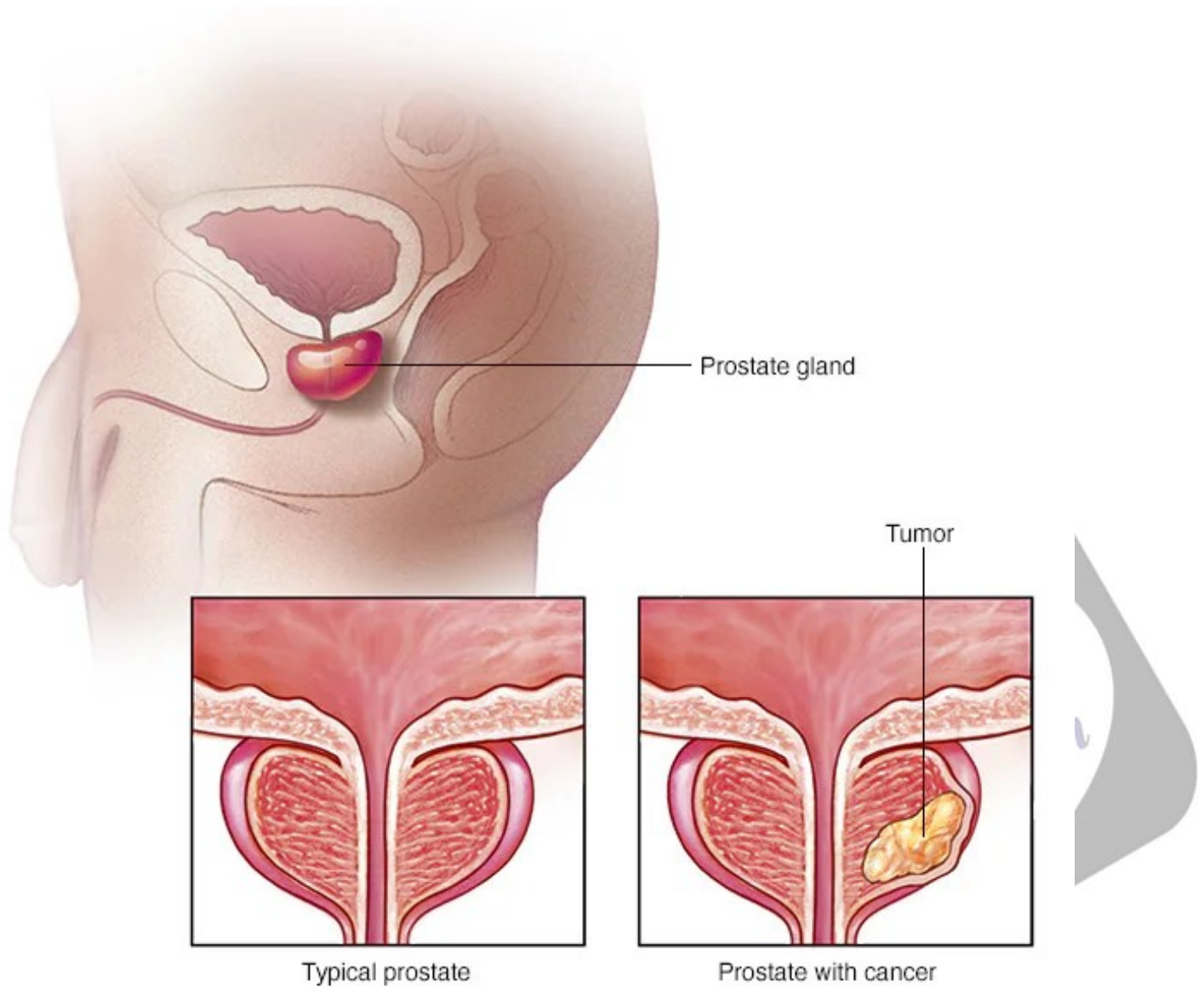
### **Why in News?**

A recent Lancet Commission paper highlights the alarming **rise in prostate cancer cases in India**, leading to a higher mortality rate due to late-stage diagnosis.

- In India, a large number of patients are diagnosed with advanced-stage cancer, leading to a **65% mortality rate**.
- Globally, **prostate cancer cases are expected to double by 2040**, with low and middle-income countries facing the most significant rise, including India where new cases are projected to reach 71,000 annually.

### **What is Prostate Cancer?**

- **About:** Prostate cancer is a type of cancer that develops in the **prostate, a small gland in the male reproductive system** located below the bladder. The prostate gland produces fluid that nourishes and transports sperm.



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- **Prevalence:** The Lancet Commission report predicts a global surge in prostate cancer cases, with low and middle-income countries facing the most substantial increase.
  - Worldwide, prostate cancer was responsible for approximately 3,75,000 deaths in 2020, ranking it as the **fifth leading cause of cancer-related deaths in men**.
  - It currently accounts for **3% of all cancers in India**, with an estimated 33,000-42,000 new cases annually.
    - Ageing populations and increasing life expectancy contribute to higher numbers of older men, increasing the risk of prostate cancer.
- **Risk Factors:** The risk factors for prostate cancer include age (especially over 50), genetics, diet, obesity, smoking, chemical exposure, prostate inflammation, and hormonal factors.
- **Symptoms:** Prostate cancer is typically **asymptomatic in its early stages**, but symptoms may include difficulty urinating, frequent urination (especially at night), blood in the urine, erectile dysfunction, and lower back or thigh pain.
- **Detection: Prostate-specific antigen (PSA)** blood test measures the level of PSA in the blood. **Elevated PSA levels can be a sign of prostate cancer**, but they can also be caused by other factors.
- **Treatment:**
  - **Surgery:** Surgery to remove the prostate gland (**radical prostatectomy**) is a common treatment option.
  - **Radiation therapy:** Radiation therapy uses high-energy rays to kill cancer cells.
  - **Hormone therapy:** Also called androgen deprivation therapy (ADT), it is a treatment that **reduces the amount of testosterone in the body**.

- **Brachytherapy:** This treatment implants radioactive seeds directly into the prostate gland.

[Read More...](#)

### UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q.** Stem cell therapy is gaining popularity in India to treat a wide variety of medical conditions including Leukaemia, Thalassemia, damaged cornea and several burns. Describe briefly what stem cell therapy is and what advantages it has over other treatments? **(2017)**

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