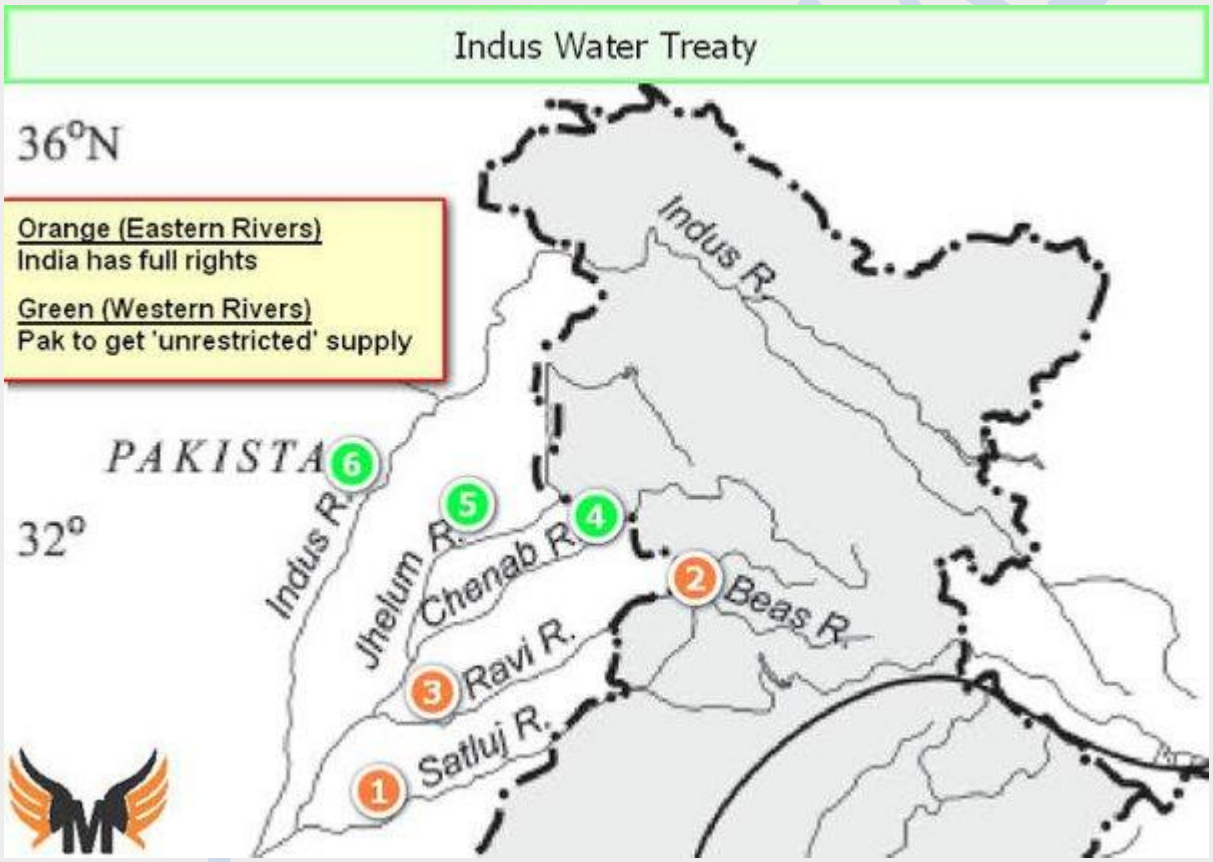
1. Why Water from Punjab Flows Unused into Pakistan

Why in News?
Despite facing severe water shortages, Punjab is unable to use a large portion of its river water, which ends up flowing into Pakistan. This is due to the lack of proper storage and water management infrastructure.

The Indus Water Treaty: What It Allows
Under the Indus Water Treaty, India has full rights over the Eastern Rivers — Sutlej, Beas, and Ravi. Pakistan gets water from the Western Rivers — Indus, Jhelum, and Chenab.



However, India cannot fully utilize its share from the Eastern Rivers due to the absence of adequate storage systems. During monsoons, when river levels rise, surplus water is released — some of it flowing into Pakistan, which then accuses India of flooding its territory.

Punjab's Water Crisis
Punjab faces a significant water deficit:
- Total annual water demand: 66.12 billion cubic meters (BCM)
- Available water: 52.85 BCM
- Deficit: 13.27 BCM

Breakdown of water sources:
• Rainfall: 20.98 BCM
• Groundwater (replenishable): 17.07 BCM
• Canal water: 14.80 BCM

Despite having major rivers, Punjab uses just a fraction of their water due to interstate allocations and lack of infrastructure. This forces the state to rely heavily on groundwater, which is rapidly depleting.

Why Punjab Can't Store or Use This Water
• Only major rivers (Sutlej, Beas, Ravi) have dams. Smaller rivers and rivulets remain unmanaged and often cause flooding.

• Canal infrastructure is outdated and needs remodeling to handle excess water and redirect it for irrigation or groundwater recharge.

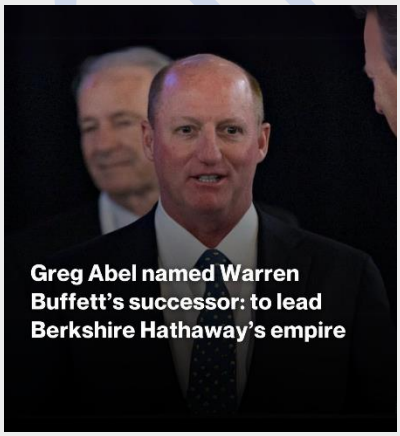
• Floodplain encroachments and lack of mini-dams or embankments worsen the problem.

Conclusion
Punjab's inability to manage and store river water is leading to wastage and worsening its own water crisis. Better infrastructure, canal remodeling, and floodplain regulation are urgently needed to make full use of its rightful share of water.

Relevance: GS Prelims & Mains Paper III; Disaster Managaement
Source: Indian Express

2. Greg Abel, the newly announced successor of Warren Buffett as Berkshire Hathaway CEO

Warren Buffett Greg Abel announcement
Billionaire businessman Warren Buffett, 94, announced he would step down as the CEO of the multinational conglomerate Berkshire Hathaway at the end of this year. Buffett has run the company since 1965.



About Gregory Edward Abel
Gregory Edward Abel was born in Edmonton, in the Canadian province of Alberta, on June 1, 1962, to a working-class family. Working odd jobs, he cleaned discarded bottles and filled fire extinguishers.

Upon graduating from the University of Alberta, he worked at the consulting firm PricewaterhouseCoopers and the energy firm CalEnergy. He joined Berkshire Hathaway Energy, then known as MidAmerican Energy, in 1992, which Berkshire later took over.

The rise of Berkshire Hathaway under Buffett

In August 2024, Berkshire Hathaway attained a market capitalisation of $1 trillion, becoming the first non-tech company to do so. Its success has been chalked upto Buffett's business acumen, in particular.

One of the key strategies Buffett followed is called value investing. It involves selecting stocks that may be underestimated by the stock market. This is based on understanding the stock market's volatility, which results in 'overreactions' that may not indicate a company's long-term fundamentals. Value investors stand to profit by purchasing stocks at discounted prices and are generally long-term investors of high-quality companies.

Relevance: GS Prelims & Mains Paper II; Bilateral Relations
Source: Indian Express

3. For the first time, 2 new genome-edited rice varieties: Why is this such a major breakthrough for ICAR and India's agriculture?

Why in News?

Agriculture Minister Shivraj Singh Chouhan released two genome-edited varieties of rice, the first achievement of its kind in the country.

These two varieties, which are climate-resilient, conserve water, and boost yields, have been developed by the Indian Council of Agricultural Research (ICAR) using cutting-edge genome editing technology.

Which are these two genome-edited varieties of rice?
These have been named 'Kamala' and 'Pusa DST Rice 1'. They have better stress tolerance, improved yields, and climate adaptability without any compromises with their existing strengths.

DRR DHAN 100 (KAMALA): Developed by the ICAR-Indian Institute of Rice Research (ICAR-IIRR), Hyderabad, this variety promises significantly higher yields, improved drought tolerance, and early maturity compared to its parent variety, Samba Mahsuri (BPT 5204).

According to the ICAR, DRR Dhan 100 (Kamala) has been developed using genome editing technology targeting the Cytokinin Oxidase 2 (CKX2) gene (also known as Gn1a), to increase grain numbers per panicle.

PUSA DST RICE 1: This new genome-edited variety has been developed over the widely cultivated fine-grain variety called MTU1010 by ICAR-Indian Agricultural Research Institute (ICAR-IARI), New Delhi.

Developed through Site Directed Nuclease 1 (SDN1) genome-editing, the new variety, Pusa DST Rice 1, targets the Drought and Salt Tolerance (DST) gene to improve the plant's resilience to harsh soil and climate conditions.

But what specific practical benefits will derive from cultivating these two new varieties?
BIGGER YIELDS, LESS EMISSIONS: According to ICAR, cultivation of DRR Dhan 100 (Kamala) and Pusa DST Rice 1 varieties in about 5 million hectares of the recommended area will produce 4.5 million tonnes of additional paddy, and a reduction of greenhouse gas emissions by 20% (32,000 tonnes).

LESS WATER CONSUMPTION: Due to shorter duration of Kamala, three irrigations will be saved resulting in saving of a total of 7,500 million cubic metres of irrigation water, which can be used for other crops.

Development of these varieties
The ICAR scientists have used the revolutionary CRISPR-Cas9 genome-editing technology to develop these two varieties.

This technology enables scientists to make targeted changes in the native genes of living organisms, creating new and desirable traits without introducing foreign DNA.

Why is this breakthrough in paddy so significant?
Paddy is India's principal crop of the kharif season, and is grown on one-third of the entire area under all foodgrain crops. It contributes about 40% to the country's foodgrain basket, and is critical to the nation's food security.

As per the Agriculture Ministry, paddy (kharif and rabi together) accounted for 45 million hectares of area, which was the highest in the world in 2020. However, in terms of production, India (186.5 million tonnes) ranked second after China (211 million tonnes). The reason is the lower yield in India. India's paddy yield (4,138 kg/ha) was lower than the world's average of 4,717 kg/ha, China's (7,043 kg/ha), Indonesia's (5,128 kg/ha) and Bangladesh's (4,809 kg/ha).

Is India developing other genome-edited varieties of crops as well?
Yes, research programmes on genome-editing have been initiated for other crops including oilseeds and pulses as well, officials said. The government has allocated Rs 500 crore for genome-editing in agricultural crops, and the University of Delhi has developed a genome-edited variety of mustard.

Relevance: GS Prelims & Mains Paper III; Science & Technology
Source: Indian Express