

1. Cotton crisis in Punjab: How regulatory hurdles might be making things worse

Introduction

In recent years, whiteflies and pink bollworms have wreaked havoc on the cotton crop in North India. Cotton yields are down, as is the area under cotton cultivation — the crop was cultivated in only one lakh hectares in Punjab in 2024, down from nearly eight lakh hectares three decades back. The drop in acreage has in turn harmed the ginning industry — only 22 ginning units remain operational in Punjab today, down from 422 in 2004.

COTTON SCENE IN PB IN LAST 10 YRS

Year	Area*	MSP	Production
2014-15	4.21	₹3,950	13L bales
2015-16	3.98	₹4,000	7L bales
2016-17	2.56	₹4,060	7.5L bales
2017-18	2.91	₹4,220	8.8L bales
2018-19	2.68	₹5,350	8.50L bales
2019-20	2.48	₹5,450	9.50L bales
2020-21	2.52	₹5,825	10.23L bales
2021-22	2.51	₹5,925	6.46L bales
2022-23	2.48	₹6,280	4.44L bales
2023-24	2.14	₹6,920	6.29L bales
2024-25	0.997	₹7,421	—



Area in lakh hectares

Ahead of the cotton sowing season, farmers are thus calling for the swift approval of Bollgard-3, a new pest-resistant genetically-modified (GM) cotton variety developed by Monsanto.

Bollgard-3, a Bt cotton variety

Bollgard-3 was developed by Monsanto more than a decade ago, and shows remarkable resistance to pests. It contains three Bt proteins Cry1Ac, Cry2Ab and Vip3A that cause insect death by disrupting their normal gut function. This in turn allows for the growth of a healthier cotton crop, and increases yield.

Bacillus thuringiensis

Bacillus thuringiensis (Bt) is a soil-dwelling bacterium with potent insecticidal properties. In the past few decades, researchers have successfully inserted certain genes from Bt in various crops, like cotton, providing these with insect-repellent properties.

Problems with Bollgard-1 and Bollgard-2

Bollgard-1 was a Monsanto-developed Bt cotton introduced in India in 2002, followed by Bollgard-2 in 2006. The latter remains prevalent today. And although these do have some pest-repellent properties, they are not effective against the whitefly and the pink bollworm, which arrived in Punjab in 2015-16 and 2018-19 respectively.

This is why farmers are demanding the introduction of Bollgard-3, which is particularly effective against pests like pink bollworm and whitefly.

However, Bollgard-3 is not available in India at the moment, although it is being used in other cotton-growing countries around the world.

Relevance: GS Prelims; Science & Technology

Source: Indian Express

2. India racing to secure supplies of copper

Introduction

On February 27, the government announced the securing of a 9,000-sq-km block to explore copper and cobalt in a region in Zambia known for high-grade deposits. With production in domestic mines faltering, the project is a crucial step for India to establish overseas mining operations.

Why copper mining matters

With the demand for copper, led by electric vehicle (EV) batteries and clean energy technologies, projected to outstrip supply from mines by 2035, countries are scrambling to secure supply chains and strengthen domestic capabilities. The race for copper will only intensify over the next decade.

Stagnant Domestic Production

Copper is listed as a critical mineral in India. Domestic ore production in 2023-24 was 3.78 million tonnes (mt), 8% lower than in 2018-19. Government-owned Hindustan Copper Ltd (HCL) is the sole domestic copper miner.

Due to stagnant domestic ore production, India's copper concentrate imports have doubled in value terms to Rs 26,000 crore in 2023-24 from 2018-19.

While India has large copper deposits, they require extensive exploration before mining can commence. Globally it takes up to 17 years on average to operationalise a copper mine.

India's overseas focus

To meet demand in the short term, India has been looking to secure both greenfield and brownfield mineral assets in copper-rich countries such as Zambia, Chile, and the DRC.

Deposits in these countries are typically of higher grade than in India – and because of their extensive focus on mining, projects could develop faster. However, investments in overseas mineral assets carry significant geopolitical risks.

Spotlight on Africa

The share of Africa in the production of critical minerals such as copper, lithium, and natural graphite is rising.

The continent already accounts for 70% of global cobalt production and 16% of global copper production. The DRC is on course to become the world's second-largest copper supplier by 2030.



India has got the 9,000-sq-km block in Zambia's Northwestern province on a government-to-government basis. The Geological Survey of India (GSI) will explore the land, which is roughly six times the size of Delhi. In the neighbouring Copperbelt province, the Vedanta Group owns a large copper mine.

Zambia is the seventh largest producer of copper in the world. (Chile, Peru and DRC are numbers 1, 2, and 3 respectively.) Canada-based First Quantum Minerals and China's state-owned Nonferrous Metal Mining are among the largest producers of copper in the country.

India's Ministry of Mines is working through nodal officers in the DRC, Tanzania, Mozambique, and Rwanda to acquire more critical mineral assets for exploration, but competition from other countries will remain fierce.

Relevance: GS Prelims; Economics

Source: Indian Express

2. Study finds 6,327 dolphins across four States in India

Study Findings

The first estimate of riverine dolphins in India has found 6,327 of them in the Ganga and its tributaries. A press report by the Environment Ministry said there were 6,324 Ganges river dolphins, and three Indus river dolphins (a related species). There were an average 3,275 dolphins in the main stem of the Ganga; 2,414 in the Ganga tributaries; 584 in the Brahmaputra main stem; 412 in the Brahmaputra tributaries; and 101 in the Beas river.

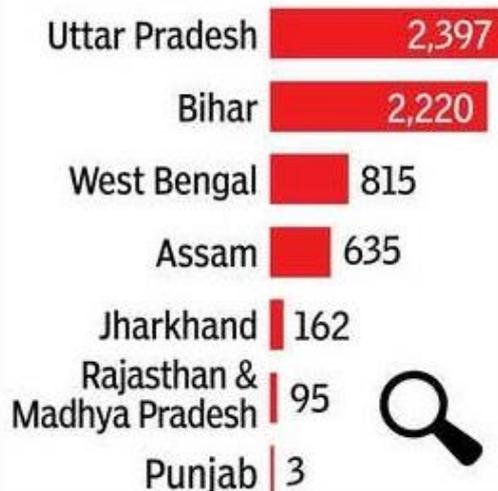
The highest number of dolphins were reported in Uttar Pradesh, followed by Bihar, West Bengal, and Assam.

Result of India's first-ever riverine dolphin estimation

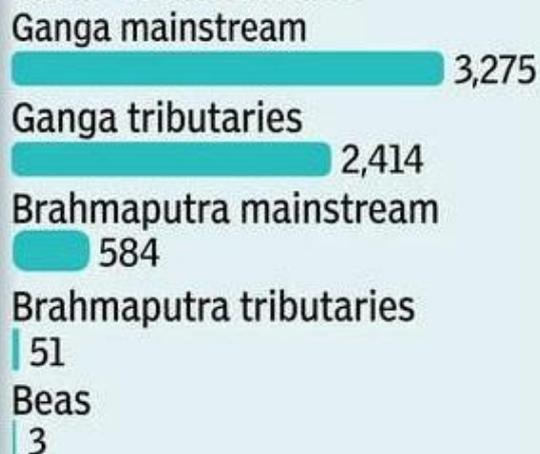
Total population | **6,327**

Ganges River Dolphins	Indus River Dolphins
6,324	3

State-Wise Status



River-Wise Status:



Counting Dolphins is Challenging

Unlike the counting of tigers, elephants and other land animals in the forest, counting dolphins is challenging. For one, the animals are under water and surface only sporadically to breathe. Second, unlike the tiger's stripes and the elephants' ears that can be caught on camera and used to distinguish one animal from the other, individual dolphins cannot be uniquely identified this way.

Survey Methodology

For their survey, the researchers travelled by boat at a constant speed using acoustic hydrophones — essentially underwater microphones — that pick up sounds emitted by the dolphins. The animals are blind and rely on echolocation to communicate and move.

Comparison from previous findings not possible

Previous attempts at mapping the population have relied on vastly different methods, and so the latest number is not useful for insight on whether their numbers have changed over time, experts associated with the study told.

Dolphin 'hotspots' and 'coldspots' and encounter rates

While a major stretch of the Ganga's main stem flows through Uttar Pradesh, dolphins are sparse or absent in certain stretches of the river called 'coldspots'. In the 366-kilometre stretch from Narora to Kanpur, dolphins are almost non-existent with an encounter rate of 0.1 per km, according to the population estimation report.

Moreover, the estimation exercise found several hotspots or stretches where dolphins were abundant. As against an encounter rate of 0.62 dolphins/km in Uttar Pradesh, the encounter rate in Bihar was 1.62/km. The estimation survey attributed high dolphin occurrence in Bihar to a higher river depth, particularly at the confluence of tributaries such as Ghaghara, Gandak, Kosi and Son.

Relevance: GS Prelims; Environment

Source: The Hindu

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