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Today's Edition

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Water alarm, from below the ground too

G.S. MUDUR



Water flows free from cannons to disperse government employees demanding a pay hike in Srinagar on Wednesday. (Reuters picture)

New Delhi, Aug. 12: Scientists in the US have used satellites to track groundwater loss in India's northwestern grainbasket states and observed an average 33cm-a-year drop in the water table, higher than Indian government estimates.

The satellite study has revealed a loss of 109 cubic kilometres of groundwater in Punjab, Haryana and Rajasthan, over the past six years, twice the capacity of India's largest surface water reservoir — the Upper Wainganga in Madhya Pradesh.

The study, to be published in the journal *Nature* tomorrow, provides fresh evidence of unsustainable consumption of groundwater in a region where the rainfall deficit this year is the highest in the country. The India Meteorological Department had calculated last week that rainfall in the northwestern region this season has been 40 per cent below normal.

The rate of groundwater depletion suggests that the region may experience a severe shortage of potable water, reduced agricultural productivity, and extensive socio-economic stresses, the US-based research team has warned.

"The groundwater loss is happening year after year. The study highlights a need to protect the resource before a catastrophe," said Matthew Rodell, a hydrologist at the Nasa Goddard Space Flight Center in the US.

Indian agricultural scientists who have long been aware of groundwater depletion in the northwest estimate that about 95 per cent is used for irrigation. The recharge of groundwater from rain each year is much less than what is withdrawn.

Agrometeorologists concede that better management of groundwater could help when drought-like conditions emerge — as they have this year. "When the rains fail, farmers depend even more on groundwater for irrigation — and the groundwater loss is exacerbated," a scientist said.

Rodell said depletion was likely to continue until steps were taken to curb groundwater demand. "Higher efficiency irrigation or incentives to build up groundwater reserves are possible options," Rodell told **The Telegraph**.

Soil scientists say India's appetite for rice and paddy cultivation in the northwest has contributed to the groundwater loss. "Paddy needs a lot of water. We have been asking farmers in the region to diversify with other crops — but rice is economically much more attractive," said Krishan Lal Khera, head of soil science at the Punjab Agricultural University, Ludhiana.

The new study used a pair of satellites — the Gravity Recovery and Climate Experiment mission — that analyse the impact of tiny changes in Earth's gravity on each other to study changes in surface water and groundwater on the planet.

It suggests that Punjab, Haryana and Rajasthan are losing about 17.7 cubic kilometres a year equivalent height of water — higher than the ministry of water resource's estimate that the difference between the available recharge and withdrawal of groundwater is about 13.2 cubic kilometres per year.

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The study indicates that the amount of irrigated water that seeps into the soil and returns as groundwater is less and the rate that is withdrawn is more than what the government has estimated.

Scientists have previously used the twin GRACE satellites to monitor the loss of polar ice in Greenland and on Antarctica. "But when you look at the satellite data, India's northwest also jumps out like a big red bull's eye," Rodell said.



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