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## **Northern India's water is vanishing due to agriculture, human consumption**

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**mongabay.com**

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It's a disaster in the making: a new study by NASA and UC Irvine has found that the groundwater beneath northern India has been vanishing at a rate of a foot per year during the last decade. In total 109 cubic kilometers (26 cubic miles) has been lost in six years time—three times the size of Lake Mead in the United States.

"If measures are not soon taken to ensure sustainable groundwater usage, consequences for the 114 million residents of the region may include a collapse of agricultural output, severe shortages of potable water, conflict and suffering," said Matt Rodell of NASA's Goddard Space Flight Center and lead author of the study appearing in *Nature*.

The researchers found that the reason for the declining water was due to human consumption with irrigation as the primary cause.

The loss of groundwater is particularly troublesome because replenishment of the water can take months or years and is dependent on local conditions. Unlike rivers and lakes, sources of groundwater do not respond directly to precipitation.

"Groundwater mining – that is when withdrawals exceed replenishment rates – is a rapidly growing problem in many of the world's large aquifers," Jay Famiglietti of UCI Earth system explains. "Since groundwater provides nearly 80 percent of the water required for irrigated agriculture, diminishing groundwater reserves pose a serious threat to global food security."

To measure monthly changes in the groundwater, hydrologists employed twin satellites from NASA named GRACE (Gravity Recovery and Climate Experiment) over a period of six years.

"For the first time, we can observe water use on land with no additional ground-based data collection," Famiglietti explained. "This is critical because in many developing countries, where hydrological data are both sparse and hard to access, space-based methods provide perhaps the only opportunity to assess changes in freshwater availability across large regions."

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