

# GREENHOUSE GAS EMISSIONS FROM INDIAN PADDY FIELDS VERY HIGH: STUDY

Relevant for: Environment & Disaster Management | Topic: Environmental Degradation - GHGs, Ozone Depletion & Climate Change

A woman farmer picking weeds in a paddy field in Mysuru district. | Photo Credit: [K. Murali Kumar](#)

Rice farming across the world could be responsible for up to twice the level of climate impact relative to what was previously estimated, according to a study conducted in India. The study, published in *PNAS*, found that intermittently flooded rice farms can emit 45 times more nitrous oxide as compared to the maximum from continuously flooded farms that predominantly emit methane.

According to a global analysis by Environmental Defense Fund (EDF) in the US, methane and nitrous oxide emissions from rice farms could have the same long-term warming impact as about 600 coal plants. “The full climate impact of rice farming has been significantly underestimated because up to this point, nitrous dioxide emissions from intermittently flooded farms have not been included,” said Kritee Kritee from EDF, who led the study.

The researchers investigated greenhouse gas emissions from rice farms across southern India. They found that nitrous oxide emissions from rice can contribute up to 99 % of the total climate impact of rice cultivation at a variety of intermittently flooded farms. These emissions contributed substantially to global warming pollution — far more than the estimate of 10% previously suggested by multiple global rice research organizations.

The researchers found an inverse correlation between methane and nitrous oxide emissions from rice farming. Water and organic matter management techniques that reduce methane emissions can increase nitrous oxide emissions, they said. This, the team said, is crucial because nitrous oxide is a long-lived greenhouse gas that traps several times more heat in the atmosphere than methane over both 20 and 100-year time frames.

“Increasing pressure on limited water resources under a changing climate could make additional rice farming regions look to intermittent flooding to address water limitations and concerns about methane emissions,” Kritee said.

Rice is a critical source of nutrition for the world’s rapidly growing population, providing more calories to humans than any other food, researchers said. However, growing rice is also resource-intensive: rice cultivation covers 11 % of the Earth’s arable land, consumes one-third of irrigation water.

The researchers found that carefully chosen farming techniques at individual farms reduced net greenhouse gas emissions from rice cultivation by as much as 90% by integrating shallow (mild-intermittent) flooding with co-management of nitrogen and organic matter.

If all irrigated rice farmers only used the proposed shallow flooding instead of continuous or intense forms of intermittent flooding, estimates in the accompanying analysis shows that the rice farms with irrigation have the potential to reduce their global climate impact by 60%, they said.

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The study tracked activity levels of 1.9 million people in 168 countries across the world during 2016.

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