

Disappearing rice fields threaten more global warming

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All over China, a huge change has been taking place without any of us noticing. Rice paddies have been (and are being) converted at an astonishing rate into aquaculture ponds to produce more protein for the

worlds growing populations. This change risks creating an unexpected impact on global warming.

International researchers, including Prof Chris Freeman from Bangor University, have found conversion of paddy fields to aquaculture is releasing massive amounts of the greenhouse gas methane into the atmosphere.

The UN Intergovernmental Panel on Climate Change (IPCC), have warned the planet will reach the crucial threshold of 1.5 degrees Celsius above pre-industrial levels by as early as 2030, precipitating the risk of extreme drought, wildfires, floods and [food shortages](#) for hundreds of millions of people. Freeman commented "Another source of methane is the last thing we need".

It was always assumed that because [rice paddies](#) are already a huge source of atmospheric methane, nothing could happen to make a difficult situation worse.

When describing their work which appears in *Nature Climate Change*, Prof Chris Freeman commented: "We were amazed to discover that methane production from the converted rice paddies was massively higher than before [conversion](#)."

Prof Freeman of the University's School of Natural Sciences explains:

"Paddy fields produce huge quantities of methane when decaying [plant material](#) is broken down by microbes called methanogens in the oxygen-free waterlogged paddy soils. But in the aquaculture ponds that are replacing the paddy fields, vast quantities of food are added to feed the crabs and fish that are being grown in them, and that massively increases the amount of rotting material for the methanogens to produce even more methane."

Prof Freeman added: "We have known for some time that rice paddies were bad for global warming. But the realisation that there's a "hidden" new source of problems is taking these threats to whole new level."

There is also hope revealed in their studies though. Their research shows that if modifications were made to aerate the aquaculture ponds, much of the harmful [methane](#) could be eliminated before it reached the atmosphere. The IPCC warn global net emissions of carbon dioxide would need to fall by 45% from 2010 levels by 2030 and reach "net zero" around 2050 in order to keep the warming around 1.5 degrees C. The race is now on to ensure these changes are introduced before the current increasing rate of land use change exacerbates the [global warming](#) situation further.

More information: Junji Yuan et al. Rapid growth in greenhouse gas emissions from the adoption of industrial-scale aquaculture, *Nature Climate Change* (2019). [DOI: 10.1038/s41558-019-0425-9](https://doi.org/10.1038/s41558-019-0425-9)

Provided by Bangor University

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