

## AI-based weather insurance stands to lower farmer premiums 37%, say scientists

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Machine-learning designed weather insurance reduces risk, lowers insurance premiums, and improves farmer efficiency, say researchers. (Getty Images/Antonymspencer)

**Researchers have used machine learning to design a more cost-efficient insurance contract that could better protect farmers against weather risks arising from climate change.**

A research team from Singapore's Nanyang Technological University used a type of artificial intelligence (AI) called neural networks to uncover intricate relationships between weather variables such as temperature and rainfall, and crop production losses.

The research, co-led by associate professor Zhu Wenjun and assistant professor Zhang Jinggong, claims the complex relationships unearthed were remarkably different from those described by conventional linear models that are more straightforward.

"Index insurance could effectively manage systemic weather risk," they write in the research paper.

"However, the current insurance has large basis risk and is less cost effective, which leads to low insurance demand."

Tapping into recent advances in machine has allowed them to a new contract to more effectively measure farmer risk.

Neural networks are machine learning models designed to process data in a way that mimics the function and structure of the human brain. Neural networks have become a fundamental component of AI, contributing to the development of sophisticated AI systems

Based on the results of their empirical case study, the researchers designed an AI-based weather index insurance contract for farmers. More than 90 years of corn production data from the US was studied.

The contract could improve policyholders' wealth by nearly 5% with a 37% lower price compared to the current average price considered in the study. This stands to improve market demand for such products, the researchers believe.

### Insurance innovation needed for agricultural efficiency

They add the findings open the way for governments to optimise initiatives to reduce the financial burden on public agencies and develop innovative measures to help the agriculture sector during a climate-related crisis.

The new insurance policy could also enhance the overall wellbeing of farmers by helping them get the most benefit from the policy and feel more secure about their financial situation, despite challenging climate conditions.

The outcomes of the research also set the stage for a paradigm shift in using AI to design financial products potentially across borders and even those in industries beyond agriculture.

Read about the research, [Managing weather risk with a neural network-based index insurance](#), published in *Management Science*, DOI: 10.1287/mnsc.2023.4902.