



Alternative Cereals can Save Water

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Replacing rice and wheat with 'less thirsty' crops, such as maize, sorghum, and millet, could dramatically reduce water demand in India, while also improving nutrition - a study has found.

- India will **need to feed approximately 394 million more people by 2050**, and that is going to be a significant challenge -according to the study.
- Nutrient deficiencies are already widespread in India today - **30% or more are anaemic** - and many regions are **chronically water-stressed**.

Background

- With the Green Revolution in the 1960s, a boom in rice and wheat production helped reduce hunger throughout India.
- But this also took a toll on the environment, increasing demands on the water supply, greenhouse gas emissions, and pollution from fertilizers.
- If this route of rice and wheat is continued, with unsustainable resource use and increasing climate variability, it is unclear how long this practice will be able to keep up.
- Maize, finger millet, pearl millet or sorghum are less harmful to the environment and already produced in India but in smaller numbers.
- Some crops, like millets and sorghum, were part of the traditional diet, but the government's heavy subsidies for rice and wheat had influenced production and dietary choices away from these nutrient-rich alternatives.
- Therefore, there is a **need to better align food security and environmental goals**.

Research Findings

- The study addresses two key objectives of the Indian government: to reduce undernourishment and improve nutrition, and to promote sustainable water use.
- The researchers studied six major grains currently grown in India: rice, wheat, maize, sorghum, and pearl and finger millet.
- For each crop, they compared yield, water use, and nutritional values such as calories, protein, iron, and zinc.

- They found that while **rice is the least water-efficient cereal** when it comes to producing nutrients, **wheat has been the main driver in increasing irrigation stresses**.
- The potential benefits of replacing rice with alternative crops varied widely between different regions, depending on how much the crops could rely on rainfall instead of irrigation.
- However, the researchers found that replacing rice with maize, finger millet, pearl millet, or sorghum could reduce irrigation water demand by 33% while improving production of iron by 27% and zinc by 13%.
- In some instances, those improvements came with a slight reduction in the number of calories produced, because rice has been bred to have higher yields per unit of land.
- In some regions, there is a tradeoff between water and land use efficiency.
- Therefore, while rice replacement is not a one-size-fits-all solution, but it should be evaluated on a case-by-case basis for each district.
- There is also a need to study Indian food preferences, to see if people would be willing to incorporate more of these alternative cereals into their diets.