

Researchers produce map of farming households across the world

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Young men work together to prepare fields in a smallholder-dense region of southern Ethiopia. Credit: Leah Samberg.

Smallholder and family farms are crucial to feeding the planet, and successful policies aimed at alleviating poverty, boosting food security

and protecting biodiversity and natural resources depend on the inclusion and participation of small farmers. However, despite the recent spotlight on small farms and increasing consensus on their importance, detailed information on location and size of smallholder farms is virtually absent. Small farms exist in some of the planet's most diverse landscapes and are home to many of the planet's most vulnerable people, and yet we have very little information about them.

A new study led by researchers at the University of Minnesota Institute on the Environment attempts to fill this crucial knowledge gap using household census data made available by the Minnesota Population Center to identify and map smallholder farms in developing countries. The study was published today in the journal *Environmental Research Letters*.

"This map is a first step toward a better understanding of where and how smallholder farming can be sustainable for both landscapes and livelihoods," said Leah Samberg, lead author of the new study and scientist with IonE's Global Landscapes Initiative.

Information about the number, location and distribution of small farms can be used to guide investments and target policies for agricultural development, [food security](#) and sustainable land use, says Paul West, GLI co-director and study co-author. "Surprisingly, there was not a map like this before. Combining both agriculture and household survey data creates a map that is a critical piece of the puzzle for targeting the billions of dollars invested in programs to improve people's lives," he said.

Among the key features of the study:

- This study is the first product to use household data to map farming populations and average farm sizes across much of the

world. It uses census data from millions of households in dozens of countries to identify farming households.

- It identifies more than 900 places in 83 countries in Asia, sub-Saharan Africa and Latin America where there are fewer than 5 hectares of agricultural land per farming household. These places are likely to be home to a high concentration of small farms and are farmed by more than 380 million households.
- These 900 smallholder hot spots are key sources of many globally important agricultural commodities. For example, they produce more than three-quarters of the planet's rice and oil palm.
- These smallholder systems produce more than half of the planet's food calories and convert more than 70 percent of the calories produced directly into the food that people eat.

"This study is only a first effort at utilizing these rich and complex data sets," said Samberg. "We envision numerous future applications of this farm size product in combination with other variables related to food security, natural resource use and human well-being that will further increase our understanding of the dynamics of small farms and the livelihoods of those who depend on them."

More information: Leah H Samberg et al, Subnational distribution of average farm size and smallholder contributions to global food production, *Environmental Research Letters* (2016). [DOI: 10.1088/1748-9326/11/12/124010](https://doi.org/10.1088/1748-9326/11/12/124010)

Provided by University of Minnesota

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