

War Leaves Fields Empty Long After Fighting Starts

A new global study shows how conflict cuts into cropland, food production, and the technical work needed to track both.



An empty cropland field with broken irrigation equipment and a drone overhead suggests farming data collection after disruption.

A new global study found that armed **conflict** is linked to long-lasting losses of **cropland**, even though the world's total cropland expanded from 2000 to 2020. According to reporting by Phys.org on research published in Nature Food, the study connected more than 460,000 mapped conflict events in 155 countries with annual global cropland maps to measure how fighting changes land used for farming.

The main finding was not just that war disrupts harvests in the moment. The researchers found that places exposed to conflict had an average 3.01% reduction in cropland area, equal to about 14.46 **hectares**, or 35.7 acres, lost each year in each conflict-exposed **buffer** region. A buffer region is a measured zone around a location; in this study, the researchers looked at areas within 5 kilometers, or 3.1 miles, of conflict locations. The effects could last for years after conflict began.

That matters because cropland is not only dirt with plants on it. It is a production system. It includes fields, **irrigation**, roads, storage, equipment, fuel access, seed supply, labor, and the business decisions that keep a farm operating. When conflict makes farming unsafe or damages the systems around farms, fields may be **abandoned** or convert-

ed to other uses. The study found the biggest losses in western Africa, eastern Africa, and Southeast Asia.

The work behind this research is a strong example of how modern agriculture depends on technical careers far beyond operating a tractor. The team used 30-meter-resolution cropland maps, meaning each image **pixel** represented a square of land about 30 meters across. That kind of mapping is often built from remote sensing, which means collecting information from satellites or aircraft instead of from the ground. A person working with this data has to understand scale, **accuracy**, land cover, and what a **satellite** image can and cannot prove.

The researchers also used georeferenced conflict events. Georeferenced means the data has location information attached, such as coordinates that allow an event to be placed on a digital map. That is the world of GIS, or geographic information systems, which are software tools used to connect data with places. GIS technicians, mapping analysts, and agricultural planners use these tools to answer practical questions: Where is land being farmed? Where has production dropped? Which roads, markets, or irrigation systems are near the affected area?

The study did not simply compare war zones with peaceful places and call the difference the result of war. The researchers used statistical methods called difference-in-differences and **propensity** score matching. Difference-in-differences compares how one place changes over time against how a similar place changes over the same period. Propensity score matching pairs locations that are alike in important ways so the comparison is fairer. In plain terms, the researchers were trying to separate the effect of conflict from other forces, such as weather, population change, or economic trends.

For CTE fields, that point is important. A weak analysis can lead to bad decisions in the real world. If a relief agency, farm business, or government office misreads why land is going out of production, it may send the wrong materials, repair the wrong system, or overlook the people who actually keep food moving. Technical workers who handle maps, soil data, crop data, or equipment records need to be accurate because the output is not just a report. It can affect where money, labor, and machinery go.

The study found that conflict-affected areas made up only about 3% of global land area but included more than 6% of the world's cropland in 2020. That means farming areas were exposed to conflict at a higher rate than their share of land would suggest. Areas with very frequent conflict lost about one-third of their cropland, according to the study summary. Conflicts that were longer and more severe were linked to larger losses than conflicts that were intermittent or lower in severity.

The researchers also looked at the social conditions around farming. Countries with higher refugee displacement and food insecurity tended to have larger conflict-related cropland losses. Refugee dis-

placement means people are forced to leave their homes, often taking farm labor, local knowledge, and community stability with them. Food insecurity means people do not have reliable access to enough food. On the other hand, countries with stronger government effectiveness, regulatory quality, and rule of law tended to have smaller losses. Rule of law means laws are applied in a predictable way, which matters for property, contracts, transportation, and farm operations.

The study also estimated what the lost cropland could have produced. After accounting for cropland gains and losses connected to urban expansion, conflict-affected areas lost about 249,667 square kilometers of cropland between 2000 and 2020. The potential dietary energy from crops that could have been grown there was estimated as enough to meet the minimum annual needs of about 255.54 million people. The researchers stressed that this is forgone production potential, not a count of people who definitely went hungry, because food access also depends on trade, prices, distribution, and income.

The hiring lesson is that agriculture and emergency response increasingly need people who can combine field knowledge with data skills. A farm manager, GIS technician, conservation worker, equipment operator, crop adviser, or food-security planner may not do all parts of this research. But the same habits show up across the work: reading maps, checking data quality, understanding local conditions, and knowing that a field is part of a larger supply chain. As conflict, weather, and development pressures change land use, the people who can connect the screen to the field will be harder to replace.

Written from reporting by Phys.org.

THINK IT THROUGH

1. When resources are limited, should agencies prioritize restoring farm infrastructure in conflict-affected areas or moving food in from outside? Defend a position and explain the trade-offs.

A strong answer: A strong answer should weigh speed, safety, long-term production, local jobs, transportation, and the risk of rebuilding systems that may be damaged again.

2. How much confidence should decision-makers place in satellite and GIS data when the issue is happening on the ground in dangerous places?

A strong answer: A strong answer should discuss the value of wide-area data while noting limits such as image resolution, missing local context, and the need for field verification.

3. What technical skills from a CTE pathway would be most useful in preventing cropland loss from becoming a food supply crisis?

A strong answer: A strong answer should connect specific skills such as mapping, equipment repair, logistics, irrigation, crop management, or data analysis to actual problems described in the article.

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C C M A Y A R L E T H P T F X P T R
R D T L S T A E N I A L D F N I D R
L A D D C E R N U E D K I N A F O L
H A A T Q I E H W G E C I C A B C C
N O C N B N I H N U N I R E D H R O
A L C L R D T E D T C T N T N T R F
I C U A N I H C P N L T G R E I X T
N C R A O A E P I A D A A O N E D C
C S A O S N U R L N N L A B O I X I
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ABANDONED

ACCURACY

BUFFER

CONFLICT

CROPLAND

HECTARES

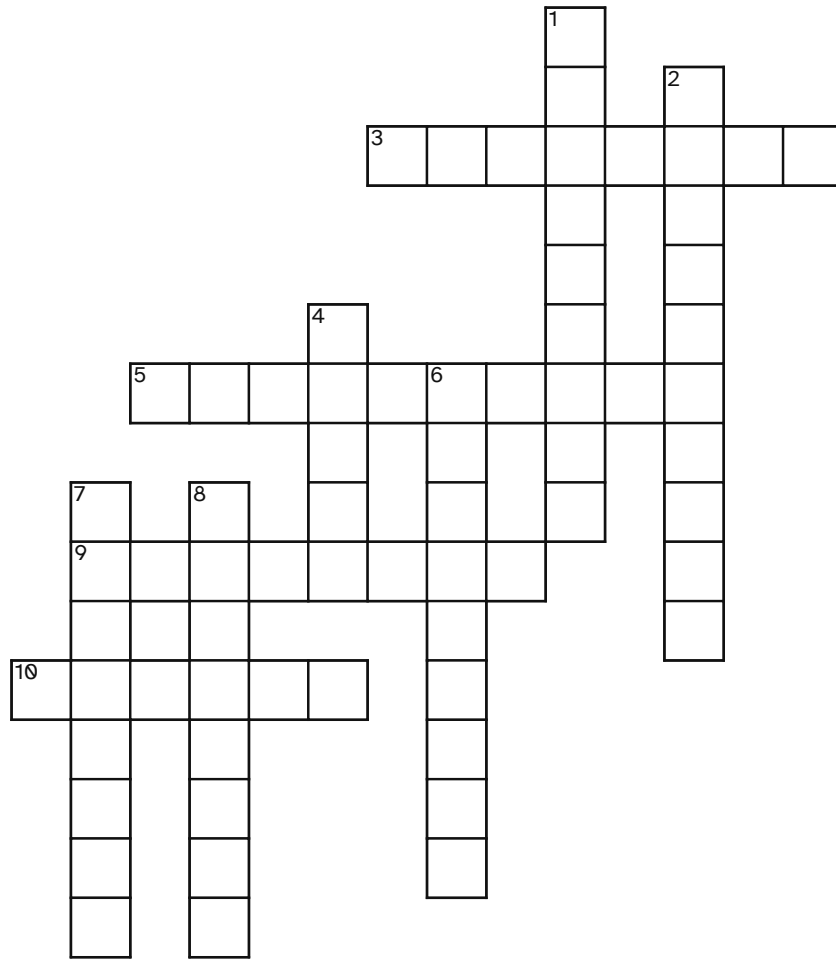
IRRIGATION

PIXEL

PROPENSITY

SATELLITE

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ACROSS

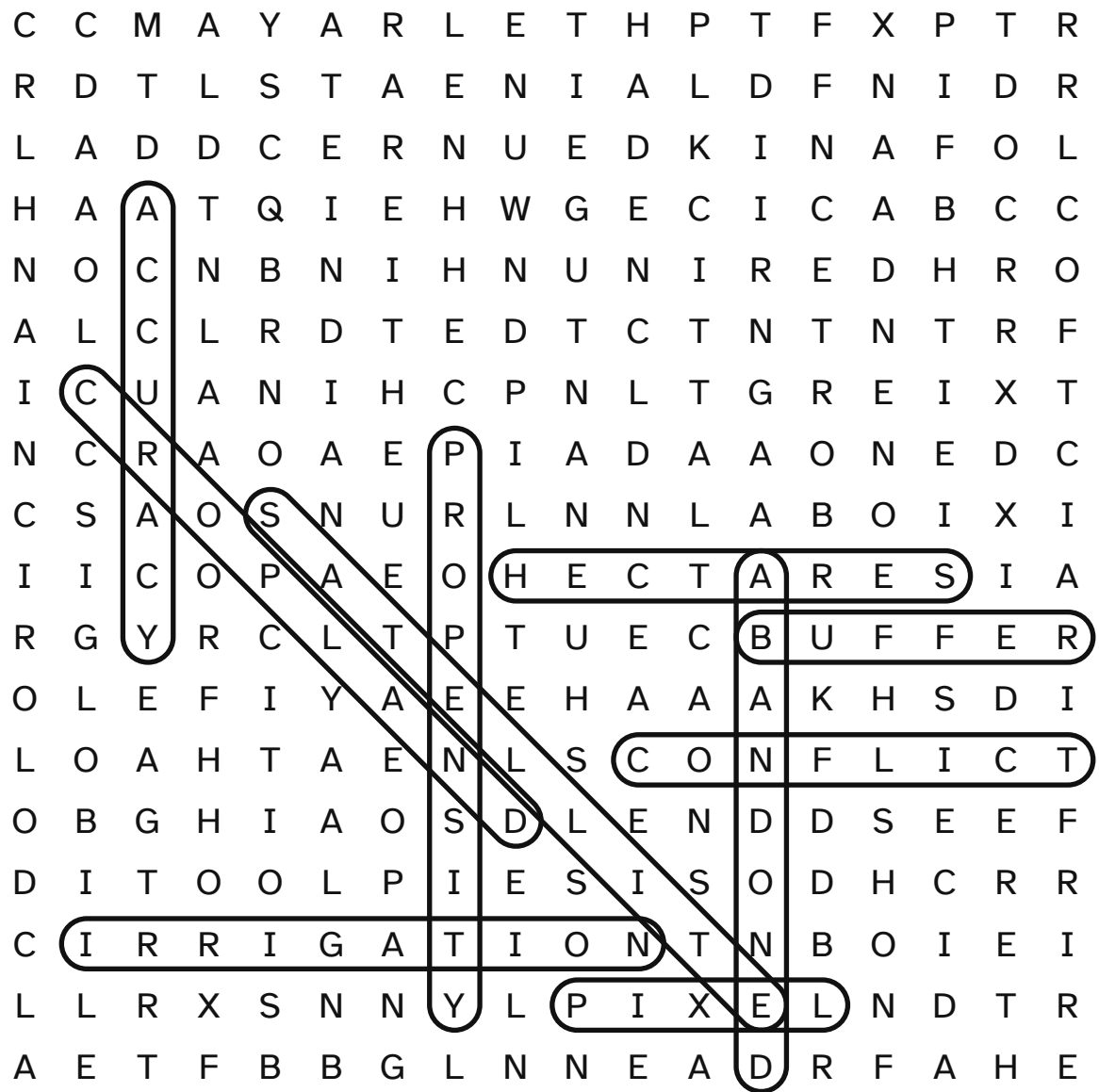
- 3 Metric land-area units equal to 10,000 square meters each
- 5 Network that brings water to fields
- 9 Fields cultivated for harvests
- 10 Mapped zone surrounding a location

DOWN

- 1 Earth-orbiting device that gathers land images and data
- 2 Tendency or likelihood that an event will occur
- 4 Tiny picture element representing part of a digital scene
- 6 Left unused, as a field too unsafe to work
- 7 Closeness of a measurement to the true value
- 8 Armed struggle that disrupts communities, travel, and farming

War Leaves Fields Empty Long After Fighting Starts

— answer key



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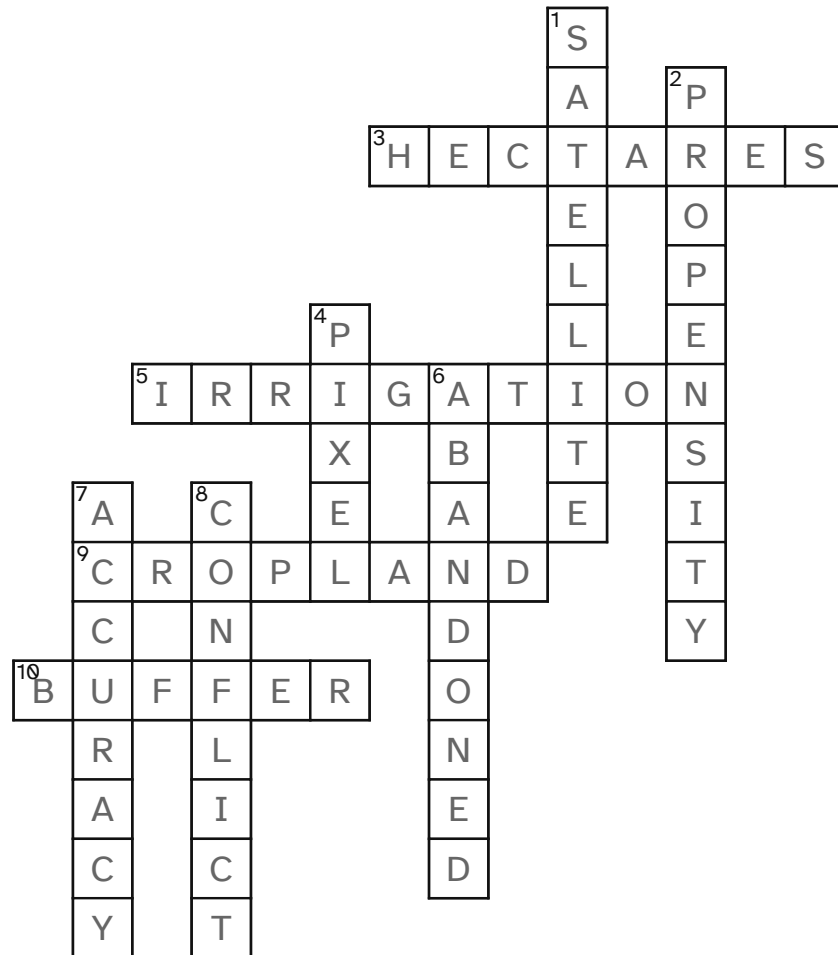
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Where this came from

This article was written for 3andB from the reporting below. It is not a reprint — the wording is ours and the facts are theirs.

Phys.org

“Global analysis reveals how armed conflict erodes farmland and potential food production”

Published Thursday, October 8, 2026

Read by us on Friday, October 9, 2026

<https://phys.org/news/2026-10-global-analysis-reveals-armed-conflict.html>

WHAT IS IN THIS PACKET

The article with a note on each question, a word search, a crossword, and the answer key to both.

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