

One-third of world's farmland is degraded -- UNEP

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Overworked farmland around the world is turning into desert, but many farmers have the ability to slow or even reverse the trend if they act soon, researchers say.

About a third of farmland is experiencing either moderate or severe soil degradation. The cumulative loss of soil fertility from drought, poor management and deforestation, known as desertification, is expected to cut agricultural production by 12 percent over the next 25 years, according to the United Nations.

"We are in a race against time," said Jeffrey Herrick, a soil scientist at the Department of Agriculture's Agricultural Research Service.

Desertification creates a devastating downward spiral. Degraded soils are less able to absorb rainfall, leaving farmland susceptible to flooding. Floodwaters then wash away even more soil, leaving the land even less productive. Though degradation has been happening for millenia, changing land use has accelerated the process, and climate change will make it even worse, Herrick said.

"If we can't stop land degradation, with the increased storm events, we are going to get these increasing storm feedbacks that are negative," he said.

In other words, more storms will mean more soil loss and even worse soil quality.

But despite the scale of the problem, changing farmland management can have a positive impact.

"My concern is that people are increasingly blaming climate change for runoff and soil droughts because water isn't getting into soil and they're thinking it's not in their control, when in fact it is in their control," Herrick said.

In a new report released today by the United Nations Environment Programme's International Resource Panel, Herrick and other researchers lay out ways that national governments, international aid organizations, farmers and conservationists can keep farmland from becoming more degraded and protect against future losses from climate change impacts.

The report's release coincides with the World Day to Combat Desertification and Drought in an effort by the United Nations to draw more attention to the global problem.

Learning from the Dust Bowl days

The researchers call for the systematic evaluation of agricultural soils across the globe so that farmers can focus on growing the mix of crops that are best suited to the type of soil on their land. This approach also helps identify land that is especially vulnerable to degradation and areas where soil restoration would be most likely to succeed with different management practices.

The researchers put a particular emphasis on promoting resilient farmland, something previous reports by IRP had not focused on, said Herrick.

Matching land use with the right "land potential" can help farmers to boost their yields and limit the need to expand farmland area, while conflicts between use and potential will make problems with land degradation worse. Even if these measures are widely adopted, not all agricultural soils can be restored, according to the researchers.

"The appropriate matching is extraordinarily important, they did a good job of showing the hazards of unrestricted actions," said Lee Norfleet, a Conservation Effects Assessment Project Cropland and Modeling Team leader at the USDA's Natural Resources Conservation Service (NRCS). He was not directly involved with the study.

While many developing countries currently have limited data about their soil quality, the United States has been using many of the methods recommended in the report for decades. Following the Dust Bowl in the 1930s, when billions of tons of soil was lost in the Great Plains, the Department of Agriculture began a program to more closely manage how farmers were using their land, said Norfleet.

"When we met with this disaster, the Soil Conservation Service [now the NRCS] was created with the idea of protecting the resource," he said.

A greater emphasis on farm management was coupled with growing research on the quality of the country's soils. The United States conducted its first national survey in 1899, where researchers mapped out the types of soils that existed around the country.

Creating an app for that

Since the first survey, scientists have updated the maps to reflect the latest soil research and give farmers an idea of what crops would do best on their soils.

The surveys are useful to farmers because they "start beginning to describe what your limitations are, what do farmers need to produce food and fiber but also to protect their land from further degradation," Norfleet said.

Creating a similar type of soil mapping system would be an important first step for countries interested in closer management of their soils, he added.

Or, if mapping isn't feasible, farmers could benefit from local farm extension staff that could give them information about their soils and the types of crops that would likely do well there, he said.

Herrick is also helping with the development of a mobile app with the U.S. Agency for International Development that would connect farmers in remote areas with information about the soils they are farming on.

As more resources on soil quality become available, farmers can begin to take action to improve their farmland, said Herrick.

"People can start using this kind of information to make decisions immediately," he said.