

Analyzing the Capacity for a Soil Health Initiative in Armenia



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Introduction

Armenia is a small, landlocked country located in the Caucasus mountains. The country is extremely vulnerable to the rapidly changing climate due to increasing temperatures, decreased precipitation and increasing drought, wind and water erosion, hail and frost, flooding and landslides, and wildfires.

Improving soil health enhances soil structure which helps with retaining water and nutrients. Wind and water erosion can be directly improved by using soil health farming practices, including no till and cover crops to improve soil structure. Currently many farmers in Armenia overuse the water resources for irrigation. If farmers improve their soil's health, they will also reduce runoff and the need for intensive irrigation and increase resiliency.



Background

My interest in the project stems from my coursework in sustainable agriculture, international development, and soil health at Cornell, my ethnic Armenian heritage, my connection to a Hubert Humphrey fellow from Armenia, and my participation in a 2020 undergraduate research project in Armenia.

What is Soil Health? Soil health refers to “the capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans. Soil health includes the chemical, biological and physical aspects of soil. It speaks to the importance of managing soils so they are sustainable for future generations” (USDA, 2021). Improving soil health helps to sequester carbon in the soil and has been recognized as a critical global strategy to address climate change by reducing greenhouse gas emissions and increasing resiliency.



Image: Healthy Soils. USDA NRCS.

Methods

I used a social science, mixed methods approach, including policy analysis, survey development, and interviews. For the first year of the project, I:

- Conducted research on the soil health concept, infrastructure in Armenia, and policies and initiatives that have been developed in the United States and Armenia.
- Analyzed primary documents and conducted research on the programs currently running in Armenia related to soil fertility and land management.
- Developed a survey instrument and received IRB approval for year two.
- Conducted seven interviews with agricultural specialists and soil health professionals in both Armenia and the US.



Image of Project Partner, Artak Khachatryan, talking to farmers in Armenia. Photo by Elena Chatrchyan.

Results

Barriers:

Through my research, I discovered that there are many barriers to adoption of the concept of soil health and soil health practices in Armenia. A key barrier is that most farmers in Armenia are small scale, subsistence farmers, and farming may not be their only source of household income. Farmers don't have the resources to spend on new farming techniques.

Another barrier relates to technology, as farmers have very little access to the technology that makes soil health farming practices easier. For example, an interviewee mentioned that there is only one no-till seed drill in the entire county. The equipment is available for purchasing from different agriculture equipment dealers, but it is too expensive for the average Armenian farmer. A final barrier, is lack of knowledge and capacity. Even if farmers had access to technology, most would not know how to implement or utilize it.

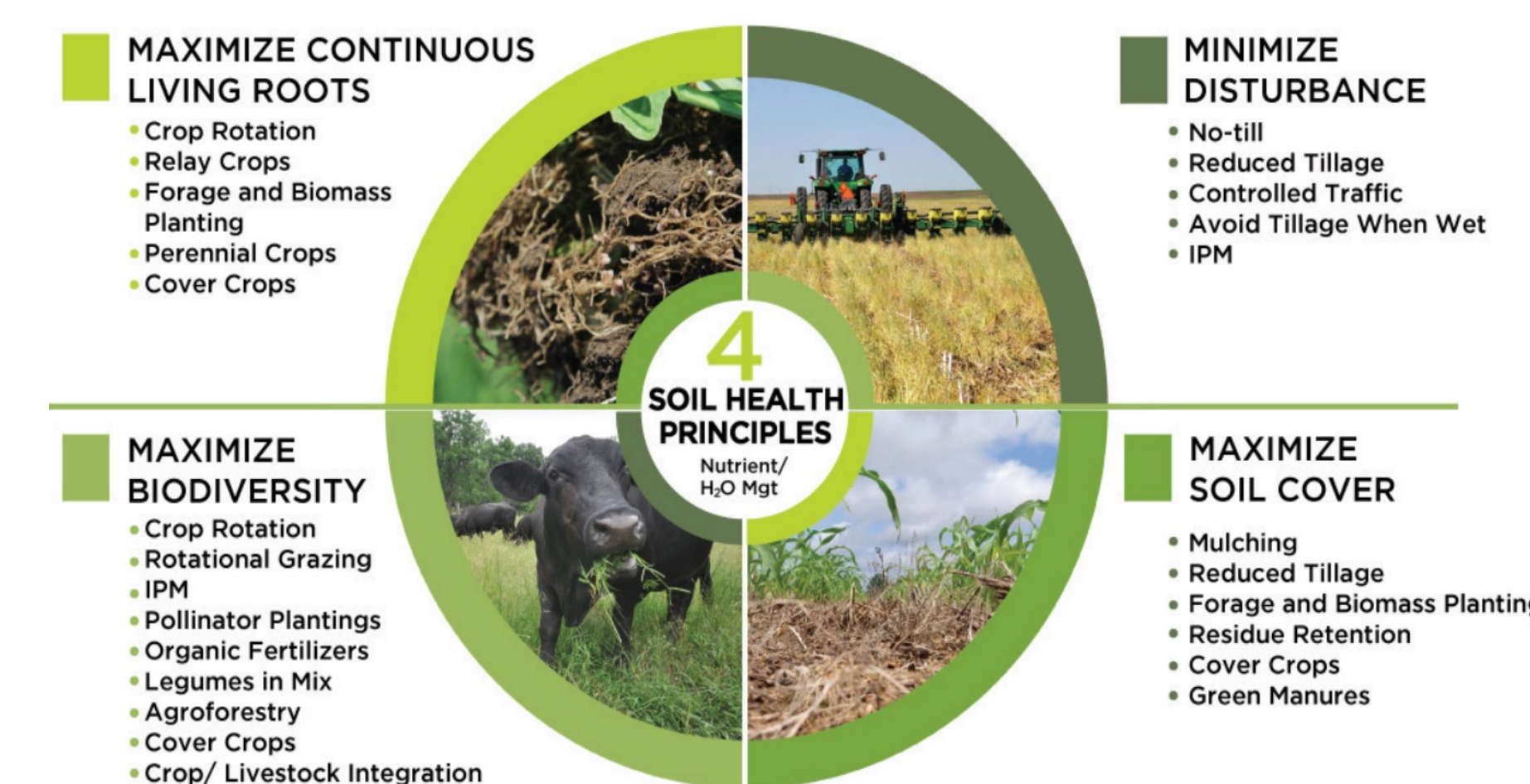


Figure 1. The four principles of Soil Health, and Resilience Strategies. Source: USDA NRCS.

Progress:

In recent years, there has been more of an effort to facilitate discussions between farmers and scientists. When speaking with the official from the Armenian Soil Center, they mentioned that farmers are able to get their soil tested through the soil center. But most are not aware of the concept of soil health, or the need for testing, or where to get testing done. They also mentioned that a lot of data is kept via print only and that they are working to make the data available on a new website. There have also been a few demonstration plots established recently.



Image: Mt. Ararat w/ agricultural fields below. Source: Araratour

Conclusions And Recommendations

One of the largest barriers limiting adoption of soil health is the lack of awareness and knowledge. Most farmers in Armenia are unaware of the topic and soil health practices. Farmers need to understand the benefits of adoption soil health – saving time and money in the long run. For example, one of the few farmers that has adopted minimal tillage has done so because he didn't have the time to do more tilling.

Armenian officials need more support and clear policy directives to build up a soil health initiative. Armenian Extension specialists need training, and capacity building to market soil health practices save time and money. As a Cornell Soil Health expert pointed out, while understanding the concept of soil health is good, it does not need to be there for farmers to adopt the practices.



The Pokr Vedi Cover Crop Demonstration Plot with several farmers in the background. Photo by Artak Khachatryan.

Acknowledgments

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