Soil and Food Security

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The challenge of food security is one of the greatest threats to human society. From 2014 – 2016, hunger affected just over one in nine people in the world. Continuing population growth means that the global demand for food will increase for at least another 40 years.

Food security is central to the United Nations (UN) 2015 Sustainable Development Goals which broadly aim to "end poverty, protect the planet, and ensure prosperity for all". SDG 2 is 'Zero Hunger: end hunger, achieve food security and improve nutrition and promote sustainable agriculture'. Approximately 95% of the world's food comes from soils. Effectively managing our soils is essential to maintain and increase crop yields, necessary to meet this zero hunger objective.

Food security is a complex issue encompassing biophysical, socio-economic, and political challenges. Simply increasing food production will not address food security and many soils are already approaching their productive limit.

Food security must instead be addressed through the broader concept of soil security. Soil security aims to maintain and improve the world's soil resource. It recognizes that soil is not just a biophysical product. How we value and relate to the soil affects its ability to produce the resources we need.

The five dimensions of soil security – capability, condition, connectivity, capital, codification – distinguish between the current state of the soil, optimal state of the soil, and how the soil is used and valued.

Addressing food security on the global scale is a difficult problem, but understanding which dimension of soil security is the greatest threat for the situation is more achievable at the farm scale. For example, can the soil produce the required food (*capability*), and can it keep doing so (*condition*)? Does the land manager have the right knowledge and resources to manage the land according to its capability? (*connectivity*). Connection to the soil often comes through land tenure because soil is used less optimally where land tenure is unclear or absent (*codification*).

Is the soil valued more for its food production capabilities, ecosystem services, biodiversity, or ability to mitigate climate change (*capital*)? Places in the world that are most food insecure are also often regions with competing demands and existing soil degradation.

Soil security founded on sound evidence-based soil science is key to food security, and in itself is fundamental to continued human existence on Earth.

<u>Further Reading</u>

Field DJ, Morgan CLS, McBratney AB (Eds.) (2017) Global Soil Security, Springer; Switzerland.
McBratney AB, Field DJ, Koch A (2014) 'The dimensions of soil security' *Geoderma* vol. 213, pp. 203-213.