Feeding the World

How can scientists use the idea of the Earth's spheres to address complex global problems such as feeding the world?

World Trade Organisation (2019). Qu Dongyu – 7 October 2019. CC BY-SA 2.0. via Wikimedia Commons

Qu Dongyu, the Director-General of the Food and Agriculture Organization of the United Nations (FAO), said:

> *'As much as 95 percent of global food production depends on soil. However, unsustainable agricultural practices, the overexploitation of natural resources and a growing population are putting increased pressure on our soils. A third of them are already degraded, and experts estimate that soil erosion could lead to a 10 percent loss in crop production by 2050'* (FAO, 2022).
>
> Qu Dongyu also believes that *'freedom from hunger is a basic human right, and that in the 21st century we have the capability to eradicate chronic food insecurity'*. While challenges loom, Qu's cardinal principle is that problems can also be the source of progress (FAO, n.d.).

1. **Use the text from Qu Dongyu to answer the following guiding questions.**

a) What is the issue?

b) What is the Earth science event?

c) What is changing?

This resource has been developed by Primary Industries Education Foundation Australia, Soil Science Australia and Soils For Life, supported through funding from the Australian Government's National Landcare Program.

Feeding the World (cont.)

2. In this task, you will focus on the impact that the loss of soil organic matter has in both natural and agricultural ecosystems. Use the FAO infographic poster, What is soil organic matter? to list the effects that loss of soil organic matter has on ecosystems. You will need to scroll down the webpage to find it.

What is soil organic matter? https://www.fao.org/3/ca7167en/ca7167en.pdf

Record your ideas below.

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Feeding the World (cont.)

3. Use your notes from task 2 to write at least two cause-and-effect sentences about how the loss of soil organic matter affects the planet. For each sentence, also identify which spheres are interacting.

Hint: A cause-and-effect sentence uses keywords like: causes, affects, effects, increases, decreases, changes, impacts.

For example: *The loss of soil organic matter (the event)* ***changes*** *the structure of the soil so that it is compacted together rather than crumbly.* (Biosphere affects the Geosphere]

Cause-and-effect connection between the event and two of the Earth spheres	Which spheres are interacting?
Example: Soil organic matter keeps water in the soil.	The biosphere affects the hydrosphere.

4. Why do environmental scientists use the Earth system approach to analyse global problems?

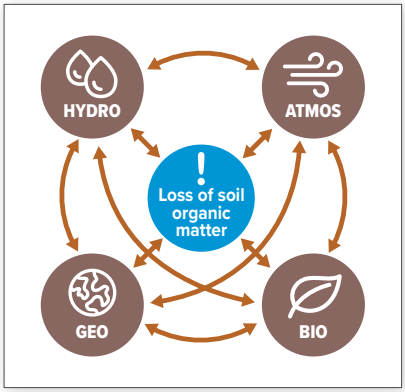

Figure 8. Event: Loss of soil organic matter

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