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# Climate Change and Transition Studies

## An Interactive Online Learning Initiative

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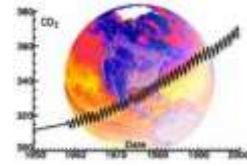
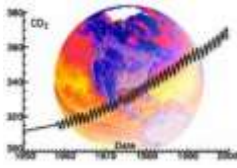
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**Climate Science for Human Survival**

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**Instructions:** After viewing the lecture and slides for Session 4 please link to and consider as many of these resources as you can to provide a background for the topics you will be undertaking in your personal research papers.

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## Additional Resources for Session 4 Lecture - 1 August 2019

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Here are a few further resources for you to consider in following up the themes presented in the online Session 4 seminar on 1 August 2019.

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The interaction between climate change, soils, agriculture and the world food supply is particularly complex because over the last seventy five years global agriculture itself has been transformed from a solar-based, organic system into a petro-dependent industrial system. Largely as a result of the “green revolution” and the motorization of agricultural machinery, the world’s modern food system has become petro-intensive. This means that the future fate of modern agriculture is intimately linked to the *continued use* of fossil fuels.

This has troublesome implications in two regards. First, future food production cannot be expected to match the rapid expansion of food supplies over the last fifty years because at some point the fossil fuels which made the green revolution possible will themselves reach the peak of their extraction and henceforth become increasingly expensive. Secondly, the changing climate – due in part to the emissions of green house gases from a petro-intensive, industrial agriculture – has begun to provoke extreme weather events, contribute to sea-level rise and otherwise alter the patterns of floods and droughts around the world. As a result in the coming years a changing climate may dramatically compromise the viability of agricultural systems that have been relatively stable for decades or even centuries.

Future, food security is, therefore, not assured, and as agricultural systems come under pressure to provide short-term food increases to meet emergency needs, the soils themselves are in danger of serious degradation through over cultivation, flooded lands or prolonged drought. Under these circumstance soils which could – with proper management – function to sequester atmospheric carbon, may, instead, start release stored CO<sub>2</sub>, methane and other green house gases (GHG), thereby further accelerating climate change.

Fortunately, the technologies and practices of restorative, organic agriculture show great promise simultaneously for building enriched topsoils, expanding agricultural yields, and improving human nutrition. At the same time these techniques can work to sequester atmospheric carbon and “fix it” in the carbon reservoirs of the Earth’s soils.

In the coming months and years in response to the “food emergencies” that are likely to become more pronounced with extreme weather events and an increase in refugee and displaced persons around the world, a number of important decisions will need to be made by leaders around the world on the future of agricultural systems. If the global food system is regarded as a realm in which to generate profits for corporations, it is likely to continue be organized as an “industry.” This could be fatal in the long run because agriculture is not an industry, governed by mechanical laws. It is a subset of biology, and at its base is the very precious, living community of the soil. If this is not preserved and enriched, humans have no future. As scientists point out, humans do not produce food. Plants do. Further we don’t grow plants, we grow soil, and soil grows plants.

For a critique of what industrial agriculture has become in recent decades since the green revolution and the gene revolution see the works of

- [Richard Manning on the Green Revolution and the End of Cheap Oil](#)
  - [Vandana Shiva](#) (+ [background sources](#))
- and
- [Richard Heinberg from What a Way to Go: Life at the End of Empire](#)

For further discussion of soils and civilization see:

- [Restorative Development: Sustainable Agriculture and the Climate Crisis](#)
  - [Got a Carbon Problem? Fix it ! Part 1 – Some Prophetic & Enduring Testimony](#)
  - [Got a Carbon Problem? Fix it ! Part 2 – Global Crisis & Localized Responses](#)
  - [Got a Carbon Problem? Fix it ! Part 3 – Growing Soil to Save the Human Prospect](#)
  - [Climate Change, Soils and Humans as a Keystone Species in the Global Ecosystem](#)
  - [Symphony of the Soil](#)
  - [“Future of Food: Dictatorship or Democracy?” by Vandana Shiva](#)
- and most recently:
- [Globally rising soil heterotrophic respiration over recent decades | Nature](#)
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