

Inquiring Minds Topic - June 3, 2022

Jim Goodale, Moderator

We Have a Solution for the Climate Crisis

Recycling, green energy, electric cars, fluorescent lightbulbs, carbon tax, average 51 mpg for cars by 2026, turning down the thermostat – Solutions to the climate crisis? Or rearranging the deck chairs on the Titanic?

The dangers of climate change are mounting so rapidly that they could soon overwhelm the ability of both nature and humanity to adapt, creating a harrowing future in which floods, fires and famine displace millions, species disappear, and the planet is irreversibly damaged. This is the conclusion of a major scientific report released on February 28, 2022, by the Intergovernmental Panel on Climate Change, a body of experts convened by the United Nations.

In short, the rising level of carbon dioxide in Earth's atmosphere may make this planet unable to support our species. Almost all the emphasis on fighting climate change today is on decreasing the rate of warming the planet by cutting back on the flow of carbon dioxide and other greenhouse gasses into the atmosphere. But can we reduce the amount of carbon dioxide **that is already in the atmosphere**? Our species **may** have the means to draw carbon dioxide out of the atmosphere faster than we are adding it. This could ultimately reverse global warming and eventually cool our planet.

If we can find the will and don't run out of time, we have a solution to heal our planet – right under our feet. Soil has the capacity to sequester immense quantities of greenhouse gases. It is the key to reversing global warming.

Modern Agriculture. The invention of agriculture significantly increased the standard of living of our ancestors as well as world population. But problems arose long ago when humans developed the plow. Its purpose was to break up the soil to make it easier to bury seeds, known as tilling the soil. But as the soil was tilled year after year, some of it simply blew away, and the quality and growing potential of the land dropped to critical levels.

The Dust Bowl of the 1930s is a good example of what over-farming can do to the soil. At that time, it was the largest man-made environmental disaster in history. Farmers tilled the once fertile Midwestern Plains, leaving the soil exposed. By the end of 1934 roughly 200 million acres of cropland were permanently damaged. President Roosevelt saw the damage & created the Soil Conservation Service, which still exists

today. With the guidance of soil experts, some parts of the Dust Bowl recovered, but much of that once fertile ground is now desert.

The Era of Industrial Farming Begins. For centuries, our food was grown on small farms, and their number peaked at 6.8 million in 1935. Livestock grazed on grass and hay, and farmers grew a variety of crops depending on the weather and the market. After a crop was harvested, grass and hay grew on the land, thereby providing grazing for livestock. The animals' hooves broke up the soil and their manure provided fertilizer. This cycle allowed farmers to raise livestock and also to sustain healthy, fertile soil for the upcoming growing season.

But today there are only about 2 million small farms averaging about 450 acres (US Department of Agriculture, December 2021). Their decline was stimulated by the introduction of so-called factory farming, which has become common since the 1970s. It has increased efficiency by dividing traditional farming into two components – growing crops and feeding livestock. From 1995 to 2020, a total of \$464 billion in federal subsidies has incentivized the creation of increasing numbers of vast farms raising primarily corn, soy & wheat to feed livestock. The second component has been the growth of huge feedlots to fatten animals as rapidly as possible for market. (<https://farm.ewg.org/region.php?fips=00000&progcode=total&yr=2020>)

Better Farming through Chemistry? The roots of wide-spread factory farming in the U.S. began with a chemist named Fritz Haber, who during WWI developed a process that synthesized ammonia from hydrogen and nitrogen gasses, which were used to produce large amounts of fertilizers and explosives. Haber also developed poison gas, which was used in warfare.

American chemical companies converted Haber's discoveries into fertilizers and insecticides, the bedrock of factory farming. Today, factory farmers routinely toss chemical fertilizers containing nitrogen onto their fields and increase yield by adding insecticides (especially with crops that have been genetically engineered to resist the insecticides). As a result, they can get a good crop, regardless of the quality of the soil – but, as we will learn, not indefinitely.

A Primer on Soil. Soil contains an entire universe of life – it's alive! In every handful of healthy soil, there are more organisms than the number of people who have ever lived on planet Earth. The quality of the soil is hugely important because it is the beginning of the quality of food. Taking care of the microbes in the soil is critical to human health and the future of our species.

Every life form on planet Earth runs on carbon, including humans and soil microbes. Plants pull carbon dioxide out of the atmosphere and turn it into a carbon fuel; that's

how they grow. But 40% of that carbon fuel is sent down to their roots, where it leaks out into the soil and becomes food for soil microorganisms. The microorganisms, in turn, bring plants mineral nutrients. In other words, soil has the unique ability to sequester carbon dioxide out of the atmosphere.

The Negative Side Effects of Industrial Farming. Spraying crops with toxic chemicals is killing our soil. All soil that is under chemical conventional agriculture is almost completely devoid of microorganisms. Then how do the plants get the minerals vital to their growth? From fertilizers. But no fertilizer contains all the minerals that soil microorganisms do. Today, it takes more fertilizer than it did in 1960 to grow a bushel of grain. Eventually, our farms will not produce crops regardless of the amount of fertilizer we spray on the soil.

Furthermore, removing millions of animals from farms and shipping them to thousands of feedlots to fatten them up until they are ready for market, has led to another unintended consequence that is devastating to our planet. The largest feedlots are over one-half a square mile and produce vast amounts of waste. A major environmental downside of feedlots is that the way they concentrate and store manure often leads to high levels of local air and water pollution. In addition, runoff of nitrogen-rich manure and fertilizers into waterways can contribute to the growth of blue-green algae and red tide and can also pollute critical underground aquifers.

Seventy percent of US cropland grows only soy, corn & hay; 99% of which goes to feed animals. And 25% of the planet's land mass has been degraded by humans. The US Department of Agriculture's Commodity Credit Corporation gives farmers price guarantees to grow specific crops – wheat, corn, sorghum, barley, soybeans & oats. Taxpayers subsidize farmers to grow crops that feed the animals that live in feedlots that contribute to air and water pollution. Without those subsidies, farmers would not make a profit. Even with genetically-altered seeds, chemical sprays, and government subsidies, today's farmers struggle to make a few dollars of profit per acre.

In the long run, factory farming will increase air and water pollution and also destroy the capacity of our arable land to produce food. And “the long run” is just around the corner. <https://www.nytimes.com/2022/02/28/climate/climate-change-ipcc-report.html>. The time to act is NOW!

Regenerative Agriculture Is a Solution. We must save our soil in the hope that it just might save us. Healthy soil leads to healthy plants. Healthy plant, healthy animal, healthy human, healthy water, healthy climate. We know how the soil works & how to farm the way we used to. Farmers are currently dropping government subsidies, and now 5% of US farms are managed for soil health. New machines have been invented

to break up a small amount of soil, and then drop in and cover a seed to avoid soil erosion. The Nature Conservancy has partnered with the National Corn Growers Association to form the Soil Health Partnership, which has a goal raising that percentage to 50% by 2025. Regenerative farming can make up to \$100 profit per acre by growing a wide variety of crops and raising livestock to build a healthy farm ecosystem.

Big Solutions Require Big Changes. What changes are necessary to move quickly to regenerative agriculture? David Attenborough has proposed that all clearing of forests be stopped and new trees be planted. Factory farms can be broken up, and farmers can widen the variety of the crops they grow. The American public can reduce the amount of meat they eat to below the daily average of 12 ounces. Legislators can refocus subsidies to farmers who switch from growing crops for livestock to producing food for humans to eat. Hard choices? Yes. Worth the effort? Time will tell...

Discussion Questions

Consider the objections to the changes above from the following groups AND how they might be overcome.

1. The American public – reduce or eliminate animal products from our food choices.
2. Members of Congress from farm states – shift subsidies from traditional farmers to regenerative farmers.
3. American farmers – return to the way our grandfathers farmed.
4. Corporate and individual owners of large industrial farms – break up these farms.
5. Corporate and individual owners of massive feedlots – eliminate feedlots.
6. Major chemical companies – minimize the use of chemical fertilizers & insecticides.

Also, what changes can Shell Point make? How about:

1. Offer new non-meat/non-dairy entrées every week at every restaurant.
2. Offer more garden plots to accommodate the 35 residents on a waitlist.

For more hope, see the 2020 documentaries, both available on Netflix: “Kiss the Ground” & “David Attenborough: A Life on Our Planet”.