Carbon Accounting is Making a Canopy Problem Look Like an Energy Problem

Atmospheric Carbon Dioxide is Tied to Soil, Not Oil

Abstract

The climate narrative builds on a misleading carbon accounting framework that is making a canopy problem look like an energy problem.

Farmers and loggers have been removing the plants that, until recently, kept the soil fungi alive, broke the wind, and soaked up the inevitable emissions tied to their operations. The result is wide open fields that emit a slow motion plume of carbon dioxide after tilling, harvesting, or clearing operations. Leaving the canopy intact makes these plumes go away.

The carbon accounting framework keeps these plumes of carbon dioxide out of scrutiny because of the long-term models used to compute carbon stock changes. The plumes tied to logging compare in size with those of the German economy. Those tied to farming operations are much larger.

It follows that atmospheric carbon dioxide is tied to topsoil loss, and that reversing the trend is a simple matter of strategically putting plants back into farming (and logging) operations.

This explanation is compatible with isotopic analyses that pin the blame for atmospheric carbon on fossil fuels: plants simply cycle it first. It also points to simple ways to soak up the output of industrial smokestacks.

Author: Denis de Bernardy <ddebernardy@protonmail.com> (unaffiliated).

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Introduction

The effects of carbon dioxide on climate, the merits of climate solutions, and the ways to address climate skepticism are at the center of climate debates. These debates distract attentions away from a problem at the heart of the climate narrative, which is the carbon accounting framework. The latter steers attentions towards emission sources like fossil fuels while keeping other, larger sources of avoidable emissions out of view. Plumes of carbon dioxide tied to canopy loss especially. This points to simple solutions to reduce atmospheric carbon dioxide that do not depend on reinventing modern economies.

Canopy Loss

Forestry emissions research inadvertently reveals what is actually fueling the rise in atmospheric carbon dioxide. A forest clear-cut produces a slow motion plume [1] of carbon dioxide. It's a wide open field with no plants to soak up the emissions tied to decomposition. The plume eventually stops when the canopy recovers. Thinning a forest instead leaves the canopy intact and produces no such plume [2]. The leftover trees keep the soil fungi alive, break the wind, and soak up the inevitable emissions. Put another way, carbon emissions emitted below a canopy will tend to get soaked up by that canopy.

The carbon accounting framework is making this canopy problem look like an energy problem. Emission sources like fossil fuels get booked (and vilified) like expenses would be in a profit and loss statement. Land use emissions [3] are more like balance sheet entries. They get tracked as carbon stock changes. Those are based on long-term estimate models that ignore short-term dynamics, such as what happens shortly after you clear a forest. Loggers, for instance, treat their carbon stocks as constant on the basis that they rotationally harvest and replant their tree plantations. And that serves as the basis for treating biomass as a low emission source of energy in places like the European Union.

The numbers are nothing to sneeze at. A field full of tree stumps will spew several kilograms of carbon dioxide [1] per square meter into the atmosphere before the canopy recovers. Exactly how much varies, but in the order of 10 tons per acre is a good ballpark to have in mind. Loggers harvest over 60 million acres [4] each year. Most of those get cleared. So

that's a German economy or so worth of easily avoidable forestry emissions. At minimum, this dubious carbon accounting needs scrutiny.

Reduced-impact logging [5] makes this sketchy accounting objectionable. It shamelessly proposes to make carbon stocks more effective by (among other activities) reducing such forestry emissions. And loggers stand to pocket carbon offsets paid by guilt-tripped consumers for their trouble. A more elaborate protection racket would be hard to come by.

Simple Solutions

Farm fields produce comparable plumes. The rise in atmospheric carbon dioxide coincides with farms getting bigger and more mechanized. These two developments led farmers to remove hedgerows. Those kept the soil fungi alive, broke the wind, and soaked up the unavoidable emissions tied to farming operations. Settlers were also moving west at the time. They turned the Great Plains into wide open fields and overgrazed paddocks.

The plumes tied to farming are so large that you can tell [6] when farmers are tilling, harvesting, or using fire to clear fields in NASA visualizations. Regenerative farming critics can question how much carbon soil can store all they want. The question that actually matters is not losing soil carbon to begin with.

Curbing these plumes is a simple matter of keeping plants in the ground. When you clear a field, leave plants around to soak up the soil emissions. A simple way to do that is alley cropping. The alleys can be wide enough to not block sunlight, if the ancient fields that dairy cows continue to graze in Normandy are an indicator. Planting directly into clover and other well designed intercropping systems would no doubt work too.

It follows that farmers could stick with planting rows of coppice trees on contour to curb these plumes. Doing so offers many benefits [7]. Trees act as windbreaks, which slows down pests. Trees on contour help water soak in, which reduces the need to irrigate. Leaves and tree roots release nutrients when they decompose. Short-cycle coppicing ensures the trees won't burden nearby crops. Biomass is a renewable energy source. The diversified revenue and the lower input costs typically make alley cropping profitable. And it's a stepping stone for farmers to go regenerative.

Better yet, farmers could restore wildlife habitat by semi-managing narrow bands around these trees like roadsides. There are better ways to address biodiversity loss, like food forest gardening, syntropic agroforestry, or mob grazing. At the same time, rewilded gardens, roadsides, creeks in logged areas, and other examples show that small patches and narrow bands left to nature, while far from ideal, are good enough. They're the ecosystem equivalent of feeding a caged animal just enough to not starve.

Fossil Fuels

Isotopic analyses have traditionally led scientists to blame fossil fuels for the rise in atmospheric carbon dioxide. The canopy explanation laid out above is not incompatible with those results. Plant canopy is soaking up nearby fossil fuel emissions per above. Tilling and harvesting operations then release it into the atmosphere. NASA visualizations [6] show that it then migrates to the Arctic. And the Arctic ocean then absorbs most of it. Topsoil carbon is fueling the rise in atmospheric carbon dioxide, and this pathway is moving topsoil carbon into the ocean. That slowly cycles old carbon out of the atmosphere. Hence the isotope analyses that find that the carbon in the atmosphere is tied to fossil fuels. It's because it is.

With this being said, fossil fuels do contribute atmospheric carbon dioxide directly. 12% of the total [8], according to a recent paper. Atmospheric carbon dioxide increased like clockwork [9] despite the drop in fossil fuel use [10] during the pandemic, so that number is plausible. It likely comes from sources with no nearby plants, like planes and industrial smokestacks.

A rocket mass heater like setup could soak up the latter if any of this mattered. Put the heat to good use, like drying wood pellets made from short-cycle coppice harvests. Pipe the output towards hemp fields using a drip irrigation like system reminiscent of those used in open field experiments [11]. Use alley cropping on contour to help break the wind and keep the water from running off. The plants will know what to do with carbon dioxide and water. Hemp soaks up toxins, so there is little need for extra filtering. It has many industrial uses, like paper.

Bubbling this output in pools to grow duckweed is another good option. Startups are already looking into using captured carbon dioxide to grow algae. Duckweed grows fast and has a great nutrient uptake. Growing it

is a good way to process sewage while producing protein-rich chicken feed and potentially biofuel [12]. The former would likely require filtering out toxins first. A hydraulic trompe might be enough to do that. It would separate toxin-laced water from pressurized gas that would be needed anyway. Irrigate nearby hemp fields using the toxin-laced waste water.

With this being said, addressing topsoil loss would quickly reintroduce the problem that plants were struggling with before the industrial era. Namely, too little carbon dioxide. Stalactites, stalagmites, shell producing animals, and other processes have been mineralizing carbon dioxide for millions of years, with occasional spikes that break this downward trend. Plants have had to adapt to having ever less carbon dioxide to work with. The recent uptick made our planet greener. Therefore, leaving the carbon dioxide up in the atmosphere makes sense too.

Conclusion

In the end, the carbon accounting framework is like a scientific version of Orwellian Newspeak. It structures and permeates debates without users realizing. It epitomizes how propaganda is as much about controlling what you think as it is about controlling what you think *about*.

This newspeak is being used to justify a host of nefarious activities. But those affected are fighting back. This information [13] is circulating in circles that are defending against carbon offset related land grabs and climate related government overreach. It is therefore only a matter of time before the carbon accounting fraud laid out in this paper gets litigated in court. And with it, the military-driven mining [14], neocolonial land theft [15], racist violence [16], shameless profiteering [17], and tyrannical control [18] that it is fueling.

Follow-up research would be desirable in two areas. The first, to look into the alley width needed to curb the plumes of carbon dioxide while keeping yields optimal. The other, to establish intercropping best practices to put these plumes to good use after harvesting operations. One option would be to grow different crops side by side. Another would be to grow directly into clover and mow before sowing into it. Yet another would be to further Masanobu Fukuoka's idea of sowing three rice varieties in one pass to get three separate harvests. A combination of these would likely be ideal.

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