# A Climate Counternarrative

How Carbon Accounting is Making a Canopy Problem Look Like an Energy Problem (for Consent and Profit)

## Abstract

The modern rise in atmospheric carbon dioxide is man-made but driven by land stewardship changes rather than industrial activities like fossil fuels.

Carbon cycle research, charts, and visualizations fail to adequately convey and represent surface-level interactions, such as the fact that plants often soak up carbon dioxide emitted beneath them. Thinning a forest instead of clear-cutting it, for instance, results in no net carbon dioxide flux above the leftover canopy in the first case, and an enormous (typically around 10 metric tons per acre), slow motion plume that wind can readily carry into the atmosphere in the other.

These avoidable plumes get little non-expert attention because the carbon accounting framework tracks them as carbon stock changes. The discrete nature of the underlying carbon stock models capture a periodic snapshot of their effects instead of the plumes themselves. These avoidable man-made plumes thereby go uncounted and unreported, despite the fact that they dwarf the man-made emissions that do get tracked. This sketchy carbon accounting then serves to justify specious activities, like carbon rationing, carbon indulgence peddling, military-driven mining, profiteering, and neocolonial land grabs.

These avoidable plumes became significant during the industrial era when farmers and loggers removed canopy to rationalize their operations. They can be curbed by strategically putting plants back in. Their scale is such that this loss of canopy explains the modern rise in atmospheric carbon dioxide far better than fossil fuels. Fossil fuels contribute a small amount too due to sources with no nearby plants. Industrial smokestacks are the main such source. Their output could sequestered using plants. Or those could be simply left as is, knowing that plants would soak up the existing atmospheric carbon dioxide were it not for the autumn plumes that wind carries away during winters.

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## Introduction

In its 6th public assessment report (IPCC, 2021), the International Panel for Climate Change (IPCC) claims that "observed increases in well-mixed greenhouse gas (GHG) concentrations since around 1750 are unequivocally caused by human activities" (Summary for Policy Makers, page 4). The latter goes on to attribute all sorts of environmental effects to the rise in GHG and other human activities. This scientific consensus has been hotly debated and disputed for decades.

Papers that challenge this consensus, which is itself disputed (Stirling, 2017), continue to get published to this day. A recent one led by Willie Soon concludes that most of the observed temperature changes since the industrial era are attributable to weather stations located in urban heat islands (Soon et al, 2023). Another led by Orla Dingley invalidates key assumptions that are at the heart of every climate model (Dingley et al, 2022; Connolly, 2022). That adds to those models' many documented data quality and overfitting problems (Frank, 2023).

The regenerative movement has also offered longstanding challenges to the climate narrative. Most prominently, Allan Savory raised that topsoil loss tied to desertification was a key source of carbon emissions in a 2013 TED talk, while presenting a livestock-based method to reverse that process (Savory, 2013). More recently, the 2020 Kiss the Ground movie (Tickell & Tickell, 2020) brought up in passing that topsoil loss tied to tilling was the proverbial elephant in the room. Around the same time, the More of Everything movie (Hansteen Jorgensen, 2021) had underlined topsoil loss tied to forest clear-cuts as yet another key emission source.

Regenerative circles also put forward that soil management affects climate through the water cycle. Indeed, land stewardship can disrupt the water cycle, thereby creating heat waves, droughts, and floods (Weiss, 2023c); or restore it by rehydrating landscapes (Weiss, 2023b; 2023a). Land stewards use this know-how to rehydrate entire regions (Millisson, 2022) and re-green deserts (Spackman, 2019) across the world.

Puzzlingly, climate models ignore how land stewardship affects the water cycle despite these demonstrable successes.  The reasons are no doubt practical.  Splitting this planet's surface into small enough columns would be computationally prohibitive and depend on (even more) non-existing data.  Plus, modelers aren't all privy with the fact that the soil and water cycle models they are using are based on defunct science that gives little agency to land stewards.  At the same time, a model that acknowledges that land stewards are turning deserts into lush landscapes would have little predictive value beyond suggesting they'd do just that.

Believers in the consensus have no shortage of problems with it too.  This goes beyond the superficial critiques of climate science and solutions that dare not question the assumptions they build on.  NASA's OCO-3 mission, for instance, is trying to locate where half of the fossil fuel emissions that humans have emitted since 1958 have gone (NASA OCO-3).  Such a gapping hole in our best understanding of the carbon cycle warrants asking if fossil fuels are even driving the rise in atmospheric carbon dioxide.  The consensus until recently had been that isotopic analyses showed that they are.  But that proverbial dam cracked wide open in the past years.

This new normal did not escape IPCC authors.  Their latest Summary for Policy Makers (IPCC, 2021) is the first of its kind to not mention fossil fuels even once.  The closest it comes is on page 30, when the authors sheepishly note that "emissions reductions in 2020 associated with measures to reduce the spread of COVID-19" led to "no detectable decrease in the observed CO2 growth rate."  Which in plain text means that the COVD-19 lockdowns had exonerated fossil fuels.  The authors go on to tout their air quality benefits, as if the idea of lockdowns somehow needed salvaging.

The natural follow-up question is: if it's not fossil fuels, then what is driving the rise in atmospheric carbon dioxide?  Land stewards who have looked into the topic would all answer tilling.  And they'd be right as we shall see, but there is a twist.  Farmers have been tilling for millennia, so tilling alone cannot explain the rise began during the industrial era.  The rise doesn't echo the rapid adoption of farming machinery, fertilizers, or biocides, so those can safely be ruled out too.  There is necessarily more to the story.

These discrepancies and questions led to this paper.  It builds on piecing together and re-analyzing existing data from a wide range of fields.  The concepts it draws on are mostly entry-level, and made complicated only by specialized and arguably unnecessary jargon. For these reasons, this paper takes liberties with academic language, and no doubt conventions.

This paper starts by highlighting the existence of demonstrably avoidable biogenic plumes of carbon dioxide tied to canopy loss. That shows that the carbon cycle keeps surface-level interactions out of view. It then lays out how carbon accounting helps justify specious activities while keeping the aforementioned plumes out of scrutiny despite their significance. That shows that the carbon accounting framework is not fit for purpose. It then puts forward a canopy loss based explanation for the rise in atmospheric carbon dioxide — which in this paper means the carbon dioxide that wind has carried above the canopy. In doing so, it suggests profitable ways to curb this rise, and a simple way to capture and sequester the output of industrial smokestacks. Lastly, it wraps up with a brief discussion of the climate narrative and the green agenda.

## Avoidable Plumes

Biomass energy, which revolves around burning forestry waste for energy, stands out in climate conversations for two key reasons. One is that it's reviled by just about every side of the climate debate. The environmental impacts of logging, the air quality impacts of burning wood pellets, and the subsidies it commands earn it a lot of hostile media and activist attention. The latter is such that a recent lawsuit (Korean Biomass Plaintiffs v. South Korea, 2020) got filed in South Korea to challenge the sector's greenness. The other is that biomass energy gives away that the carbon cycle and the carbon accounting framework need scrutiny.

Biomass energy owes its green moniker to the fact that carbon emissions are not all counted the same way. Essentially, logging produces biogenic emissions that get filed under land use (LULUCF). The resulting forestry waste will produce those emissions whether it's left on the forest floor to rot (or burn), or harvested and burnt for energy. Since the emissions tied to the forestry waste have been accounted for already, counting the emissions tied to burning that waste would be double counting. Ergo, burning wood pellets made using it for energy produces no (new) carbon dioxide. That makes it green.

Readers can verify for themselves that the bean counting checks out. It is the underlying assumptions that do not. That wood rots slowly and burns quickly is one issue. The carbon accounting framework itself is another.

The framework's inadequacy is inadvertently revealed by climate activists who circulate emission estimates tied to burning wood pellets (AxeDrax). These computations are based on reported wood pellet consumption numbers. (It's the only practical way to do them.) In other words, wittingly or not, these estimates' authors are double counting and therefore ignoring the framework. That is fine, provided these computations also include other biogenic emissions tied to the waste. They invariably don't. Back of the envelope estimates suggest that the biogenic emissions tied to logging compare with the emissions tied to burning the forestry waste (de Bernardy, 2022).

More interesting than their scale is the fact that loggers can mitigate these emissions. The latter are tied to soil-based decomposition and oxidation processes. These produce a slow-motion plume of carbon dioxide in cleared forests (Korkiakoski et al, 2019). (We'll discuss numbers later.) Forestry researchers study these plumes by measuring gas fluxes above the tree canopy before and after harvests. As the canopy recovers, the plumes grow smaller and stop eventually. Plants soak up carbon dioxide, so this should surprise no one. Nor should it that leaving the canopy intact, by thinning the forest instead of clear-cutting it, produces no such plume (Vesala et al, 2005).

Put another way, this shows that carbon dioxide emitted below a canopy tends to get soaked up by that canopy. How much carbon dioxide gets soaked up depends on the canopy's density. And clearing that canopy altogether then enables wind to freely carry away carbon dioxide into the atmosphere. Keeping trees around in a forest therefore enables trees to do what plants do: a) feed the soil, thereby preventing the fungi and other soil critters from dying and fueling more decomposition; b) break the wind, thereby preventing wind to carry away the nearby carbon dioxide to where plant can no longer use it; and c) soak up that carbon dioxide. This is on top of other useful functions, such as water harvesting, transpiration, soil cover, fertility, and habitat.

The timing of the switch to forest clear-cutting from thinning is noteworthy. Depending on the region, it occurred between the late 19th and the early 20th century. The contemporaneous development of railroads, the late

19th century move to pulp from rag paper, and the exploding demand for books tied to the advent of mass education led to a rise in the demand in forestry at the time. This timing is, of course, coincidental with when the concentration of carbon dioxide in the atmosphere began to rise. Clear-cut forests produce plumes of carbon dioxide and thinned forests do not, so this switch has necessarily contributed something to that rise.

The emission differences between clear-cut and thinned forests highlight a major problem with the carbon cycle. Essentially, carbon cycle research, charts, and visualizations keep these surface level interactions out of view. One way to study soil emissions, for instance, is to bring soil samples to a lab. That is valid, but not helpful when looking at the problem holistically. In a non-lab setting, a plant might soak up the carbon dioxide soon after it gets emitted, resulting in no net carbon dioxide flux. So while useful in the right context, such studies need a grain of salt when discussing the global carbon cycle.

At minimum, this means that the surface level interactions in carbon cycle charts and visualizations need attention. One visualization that this author came across represented ocean-based interactions sensibly, with a net flow showing what goes to the ocean floor, and another showing the net exchange with the atmosphere. Contrast with the typical representations of land-based interactions, which show arrows for plant respiration, soil respiration, and industrial emissions all pointing towards the atmosphere — as if plants were not soaking up the carbon dioxide emitted by biology or car tailpipes. Representing net fluxes above the plant canopy instead would give a more accurate picture of what the carbon cycle looks like.

Beyond these problems with the carbon cycle, these emission differences highlight a fundamental issue with the carbon accounting framework itself. Namely, the fact that, as we're about to discuss, the carbon accounting framework lets these avoidable plumes go uncounted and unreported.

## Accounting Chicanery

We need to pause at this point to sketch out how the carbon accounting framework works. It is the fruit of discussions between stakeholders with very different objectives in the run-up to 20th century climate agreements. Key protagonists included nature conservation, logging, fossil fuel, and banking interests. There is something in the framework for each of them.

The salient point to know about the framework is that it mirrors what goes on in a financial statement.  Whereas emission sources such as fossil fuels get booked like expenses do in a Profit and Loss statement, carbon stocks (LULUCF) such as forests are more like balance sheet entries.

The main would-be carbon income source are carbon allowances.  They're the cap in cap and trade schemes (Emissions cap and allowances).  In principle, programmable central bank digital currencies (Davis, 2023) could enable governments to extend those to consumers.  Whether technocrats should have the power to control what others may or may not do is a separate question.  The other two carbon income sources are more like negative expenses.

The first of these is green energy.  Entire movies (Smith Khanna, 2020; Gibbs, 2020) get into its carbon intensive supply chains, its practical problems, its ecological impacts, and the underlying mining, so we'll stick with what gets less attention here.  No carbon signature assessment ever seems to put forward a carbon footprint for living near or cleaning up the pollution tied to green power stations and their waste disposal sites; or that tied to the underlying mining (Abramovich, 2017) and the military operations (Martin, 2022) needed to secure those.  Next, this military-driven mining (Selwyn, 2020) is too often done on indigenous lands (Protect Thacker Pass).  The same goes for green tech deployments (Dunlap, 2017; Normann, 2021; Mikir Bamuni Grant); for the illegal balsa logging (Acción Ecológica, Ecuador, 2021) tied to wind turbines; and for the dams being built in developing countries to make green hydrogen for export markets (Cabello, 2021).  Surely no one's climate good conscience can justify subjecting brown people to cancers, land grabs, and drone strikes.

The other negative expense scheme are carbon offsets.  These aptly get derided as carbon indulgences, in that guilt-tripped consumers repent for their sinful carbon footprint.  The financiers who market these speculative securities (Hache, 2019) pocket a commission like medieval taxpayers did, which is fitting.  The twist is that landholders and fossil fuel giants (Valle, 2022) get to pocket the proceeds instead of the Church — the latter still gets its cut as a large landholder.  This peculiarity means that elites get to repent by paying each other, while non-elites must repent by paying elites.

Expenses warrant a note because public facing emissions data (Our World in Data [b]) is not actionable.  Items like steel or logging are meaningless to a consumer and ought to get folded into actionable choices. The trick is to note that trash is a proxy for infrastructure, transportation, and packaging use. Looking into how non-actionable items get used quickly makes repeatedly consumed goods pop out as a key source of energy use. Groceries in particular (Lawton, 2019): their footprint is small, but they get bought often and get trashed because of food waste. It follows that activists who want to keep fossil fuels in the ground would be more effective by teaching gardening at schools. The energy use consequences of the switch to grocery shopping (away from gardening) after WW2 would also need to be looked into.

Carbon stocks get little attention outside of the upsetting realities of green finance. Loggers infamously get to pocket carbon offsets (Elgin, 2022) for growing their forest inventory. Many tree planting projects are commercial tree plantations (Counsell, 2021). Those often occur on indigenous lands (the ones not yet “developed”) and in areas that lack the moisture to grow a forest (hence why there wasn’t one to begin with). Projects run by nature conservancies are the most harrowing. Behind the nature loving facade are tourist parks (Survival, 2012) that double as hunting reserves for elites (Corry, 2017b) run on indigenous lands (Ogada, 2019); with areas set aside for tree planting projects (Counsell, 2021) and mines (Survival, 2014); a dubious land stewardship record (Savory, 2017) elsewhere; and violent, militarized park guards (Warren & Baker, 2019) who evict, abuse, beat, rape, maim, and murder (Survival, 2020) the indigenous locals.

In fairness, the above draws on outliers, and many environmental projects bring value to their community. Regenerative agriculture is (mostly) legit. (Non-organic no-till can sequester carbon too.) Marine permaculture (Von Herzen, 2022) is legit too. It’s set to produce absurd amounts of yields (seafood, biofuel, fertilizer, etc.) without land. For whose benefit is a trillion dollar question that is set to trigger a land (or sea) rush. Whether legit projects need *de facto* subsidies is worth asking. The overhead needed to pocket carbon offsets is such that, like farm subsidies, they benefit big players that then put smaller ones out of business. So they’re really a market distortion mechanism that loots the many to favor the few.

The fact that carbon stocks work like balance sheet entries gets far less attention. Their value changes from a report to the next without visibility into what is actually going on inside them. The vast majority of carbon emissions occur in these black boxes. That creates a double standard.

Cherry picked sources like fossil fuels get vilified as reducible flows, while other sources get flatly ignored by non-experts. To wit, data intended for the public typically list carbon stock changes (which are often labeled as land use change emissions), have fine print to exclude those, or expressly discuss industrial or fossil fuel emissions. These carbon stock changes are mere proxies for the underlying carbon emissions. Experts track them using on long-term estimate models that mostly capture land use changes (hence the frequent mislabeling) while silencing internal dynamics.

The European Forest Institute's models (EFI Models) are typical examples of such forestry models. Essentially, transition matrixes move the carbon stock from one discrete state to the next. Such a modeling approach is sound, since continuous monitoring would be impractical. The models therefore track the net contribution of the plumes that we've discussed earlier. That is, they take periodic snapshots of how the plumes and other events have affected the carbon stocks without tracking the plumes themselves. Ergo, these plumes go uncounted and unreported despite being avoidable.

Loggers rotationally harvest their inventory, at that. That means they have more or less the same amount of trees of any given age at any time. This makes a logger's carbon stock more or less constant. That is give or take events like wildfires, and spot checks to reconcile the modeled stocks with actual ones. Such adjustments get reported under Land Use 4.A.1 "Forest land remaining forest land." The carbon loss tied to harvests do not, since the plots get replanted and things average out across the inventory. All of this makes sense within the scope of the reporting framework, so there is no indication that anything might be off.

What's off is that these accounting arrangements make sense if and only if the avoidable net emissions that are hidden in carbon stocks are negligible compared to the emissions that get tracked as reducible expenses. The contrary is like cutting expenses in your household's budget while ignoring big ticket items like revenue and rent. You *could* cut your gas budget, but why not instead work more (or better), or move to a cheaper home?

Forestry research shows that these avoidable net emissions are anything but negligible. A clear-cut will release several kilograms of carbon dioxide per square meter into the atmosphere before the canopy recovers. In Korkiakoski et al (2019), for instance, it's 3kg the first year and 2kg the next. The researchers then stop their experiment, so 5-7kg in total by the time the canopy recovered is realistic to give a sense of what we're looking at. This is a boreal forest example, and not all forests behave the same. The carbon emissions vary depending on factors like soil, temperature, and moisture. A reasonable ballpark number to have in mind is a few kilograms of carbon dioxide per square meter for a patch of tree stumps. Or equivalently, about 10 metric tons per acre.

This ballpark number is enough to guesstimate the yearly contribution of these plumes. Loggers harvest some amount each year. Plots then emit some amount each year that also varies slightly. If we take a lower bound for both of these and consider those lower bounds only, we end up with a constant harvest that emits a constant amount year after year — because this year's harvest and emissions are the same as next year's. Moreover, the yearly emissions of any year are the same, so the total emissions of a year is equal to the sum of the emissions that a single years' harvests will emit in the future — our above ballpark number.

That enables us to compute an global estimate. Loggers harvest over 60 million acres (Global Forest Watch) each year. That is based on satellite imagery, so we can assert it's all clear-cuts. Multiplying by our 10 metric tons per acre yields a German economy or so worth of avoidable forestry emissions. The order of magnitude is what matters. The exact number could be bigger, since these are lower bounds; or smaller, since we did not rigorously show that our numbers are low bounds. Had those been 30 million acres and 5 tons per acre, the point would still stand: loggers produce avoidable plumes of carbon dioxide that rival the industrial emissions of a wealthy country. So at minimum, this dubious carbon accounting needs auditing.

Reduced-impact logging (Muller et al, 2016) makes this carbon accounting objectionable. It shamelessly proposes to make carbon stocks more effective by (among other activities) curbing these avoidable plumes. The cherry on the pie is that loggers stand to pocket carbon offsets for their trouble.

The egregious activities and the profiteering that the carbon accounting framework is fueling make clear that it needs looking into. If we accept that the rise in atmospheric carbon dioxide is a problem, then what ought to get tracked is the net flux of carbon dioxide above the canopy. Not a mix of stocks and flows that may or may not contribute anything to that rise. That would pin the rise in atmospheric carbon dioxide squarely on agribusiness corporations as we're about to get into.

## Canopy Loss

To set the scene for this counternarrative, let's first note that as with clear-cut forests, so with cleared farm fields. Clearing a field by tilling, spraying, harvesting, or burning it creates a *de facto* area with a lot of dead organic matter and no nearby plants to soak up the resulting carbon emissions. It behaves like a clear-cut forest. Decomposition and oxidation processes start at once, the fungi and soil critters aren't too happy with having been plowed (those black birds follow tractors in the spring for tasty reasons), and the absence of wind breaks means wind readily carries the resulting carbon emissions into the atmosphere.

The same holds for overgrazed fields. When you regeneratively mob graze animals, you rotate them long before they're eating with their mouth to the ground. That leaves pruned plants around instead of a thinly mowed field. Those plants are then large enough to break the wind at the ground level, and soak up the carbon emissions tied to the dying roots they have let go of. This mirrors what goes on in grasslands, where predators chase mobs of grazers around before they ever get to overgraze.

This establishes two scenarios that produce plumes of carbon dioxide that mirror those of clear-cut forests. Annuals grow faster and in higher density than trees, and contain less carbon, so we should expect farming plumes to be shorter lived than forestry plumes. For the rest, soil emission studies that aren't lab-based use ground-based instruments (predictably), so they seldom tell if and how much other plants then help. Luckily, such studies still give a reasonable sense of what is going on.

Two immediate points stick out. One is that soil emissions on farm fields vary widely (Abdalla et al, 2016) depending on soil, temperature, and humidity. The other is that this variability matters little. In part, this is because annuals grow fast. More importantly, it is because the plowing method dwarfs other factors (Reicosky, 1997), with the bulk of the emissions concentrated around soil disturbance events. That is due to oxidation processes that quickly stop after soil disturbances break aggregates and put soil in contact with air.

Reicosky (1997) is helpful to give a sense of the scale,  In it, clearing a field using herbicide (no-till) produces 5.9 grams of carbon dioxide per square meter in 5 hours.  Killing everything in a field this way compares with clear-cutting a forest.  Contrast with plowing (till), which produces between 22.5 and 81.3 grams of carbon dioxide per square meter in 5 hours.  Plants don't grow instantly, so while the emissions are lower beyond that they won't stop.  Roughly 25 kilograms per acre for the no-till scenario is as such a reasonable guesstimate.  This is more or less depending on soil, temperature, and moisture in practice.

We can use that to guesstimate the scale of US farming plumes.  The US has 340 million acres (Land Portal Foundation) under temporary crops.  Permanent crops don't get replanted every year so do not matter for our purpose.  If each of those 340 million acres produces about 25 kilograms of carbon dioxide once per year in the spring or autumn (a very generous assumption, given that most farms still till), that works out to 8.5Gt of carbon dioxide … which is more than US industrial emissions (5Gt).  If we assume instead that a bit over half of farmers till and that farmers often alternate between spring and winter crops (or cover crops), then energy emissions simply look negligible.

Some readers might need help with squaring these large numbers for the US alone with the 60Gt of global soil emissions that gets thrown around online.  For starters, that number is for carbon, so 220Gt of carbon dioxide is the correct number to have in mind.  More to the point, you can tell when farmers are clearing fields on NASA visualizations (NASA, 2013).  The animations are arguably based on models, but where the emissions occur is based on reasonable data.  The plumes in the spring and autumn make it transparent that tilling is the proverbial elephant in the room.

The question, then, is what happened during the industrial era.  Much like loggers, farmers have been removing canopy since then.  Hedgerows had been steadily surrounding ever larger fields since the medieval era as land ownership became ever more concentrated.  That process sped up during the industrial era, when farmers moved en mass to the cities.  It sped up again with the advent of farming machinery.  The latter led to rationalizing field sizes and shapes even as agribusiness corporations were buying up farmland.  It stands to reason that plants in hedges used to feed the soil, break the wind, and soak up part or all of the carbon dioxide tied to soil disturbances.  Straightforward experiments would confirm this.

A follow-up question would be why no rise in atmospheric carbon dioxide occurred during the medieval and ancient eras. Prior to the enclosure era, peasants farmed a large communal field in addition to small plots and tiny strips like roadsides. They'd split the communal area in bands that they'd then farm side by side. Because they weren't all on the same crop rotation or harvesting schedule, the crops themselves would likely have acted like the hedges that surrounded small plots. This could be tested by growing different crops in side by side bands or crops in between bands of native prairie species (to create habitat for wildlife). Those will likely curb the net flux of carbon dioxide in otherwise wide open farm fields.

Other canopy related developments occurred. One was the advent of the steel plow, which made farming the Great Plain practical. Settlers moved west during the industrial era. They replaced large swaths of prairies with open fields that regularly get cleared and (at times) overgrazed paddocks. Ranchers get limited access to federal or state lands nowadays, but even those tend to get overgrazed, because animals put in too large fields tend to stay in favorite areas like by the watering hole. In Eurasia, parts of the Great Steppes got similarly turned into farmlands. To this day, farmers continue to clear savannas and rainforests. These developments explain the slowly accelerating rise in carbon dioxide (NOAA) better than fossil fuel consumption and land use changes (Our World in Data [a]), which mirror population and economic growth.

At any rate, curbing these plumes is a simple matter of keeping plants in. Loggers could thin as noted earlier. Or they could stick with keeping some trees around to act as mother trees (Simard, 2021). Those then help their offsprings. Loggers could also use the mosaic system (Suzano) that Suzano developed in Brazil. The latter consists in interspersing tree plantations between bands of native species to restore wildlife habitat. It's the ecosystem equivalent of feeding a caged animal just enough to not starve. It's not stellar, but it works well enough to earn Suzano media praise (Stott, 2020) and accolades (World Finance, 2021) — the locals are less impressed (Gonzalves de Souza & Overbeek, 2013). Combining these approaches would no doubt be profitable and turn around the biodiversity loss problem that tree plantations create.

Farmers have a whole range of profitable options as well. They could use alley cropping, which consists in growing crops in between rows of trees. Doing so is ideally done on contour to harvest water and reduce erosion.

The alleys probably don't need to be so narrow that they get in the way of yields, and they could be put on a short coppice cycle for biomass at that. The hedges could be semi-managed like roadsides (Conniff, 2013) to restore wildlife habitat. As noted earlier, bands of local prairie species would likely work too. So would growing crops in side by side bands or sowing directly into clover (Atthowe, 2011). Regenerative mob grazing and silvopasture would both work for livestock. Combining the two allows to run twice as many cows (Elizondo, 2021). (Then run birds to spread the manure as they peck at the bugs in it.)

Loggers and regenerative farmers are deploying these solutions already, so testing how they curb these plumes should be straightforward. One question that this author would love to see answered is how to best take advantage of these plumes. The most promising approach in this respect might be do-nothing farmer Masanobu Fukuoka's idea of sowing three rice varieties in one pass to get three separate harvests. The next harvest is then already growing under the ongoing harvest. It would enjoy a growth boost like leftover trees do when you thin a forest.

The usual rebuttals of regenerative agriculture are irrelevant here and too often misguided anyway. How much carbon soil can store or how fast it can store it are moot when the problem is not losing soil carbon to begin with. Plus, building soil quickly is not hard. It's a matter of having plants in and dead organic matter at all times to feed the biology. Aggressively pruning and thinning or adding extra organic matter makes this go faster. So does adding biology (yeast especially) using compost or some other way, and biochar for added microbial habitat. Syntropic agroforestry (Osmond & Wilson, 2021) and bio-intensive no-till market-gardening (No Till Growers) do this to great effect.

Regenerative mob grazing is more of the same with two twists. The first Is that animals are doing the work. They keep plants in, prune them (thereby creating underground litter), and drop manure. The other is that grasses serve as wind breaks for the ground's surface, so wind more readily carries away carbon dioxide emitted by standing grasses than by trampled ones. In particular dead grasses when it's dry. Rotational mob grazing produces optimal results by ensuring dead grasses get trampled enough. Rotational grazing (too few animals) and rotational overgrazing (too many) tend to fare worse or be outright detrimental. The same goes for wildlife reserves

(Savory, 2017) with too few animals or imbalances between grazers and predators.

Isotopic analyses that show that fossil fuels are contributing the carbon in the atmosphere are not particularly relevant either.  These would need to rule out that biology isn't cycling the carbon first.  None do insofar as this author could find.  That could be done with an isotopic analysis of plants and soils near busy roads or industrial smokestacks.  Plus, a recent study led by Kenneth Skrable (Skrable et al, 2022) found that fossil fuels contribute only 12% of the carbon.  That low number would explain the 2020 rise in atmospheric carbon dioxide, which increased like clockwork (NOAA) despite the drop in fossil fuel use (IEA, 2021) that year.  It's also consistent with the idea that plants cycle would cycle most of that carbon dioxide before plumes tied to wide open fields and other wide open areas like landfills allow wind to carry parts of it into the atmosphere.

If anything, 12% is much higher than you'd expect by analyzing the carbon cycle and net carbon dioxide fluxes.  That prompts asking what fossil fuel sources genuinely matter.  A tractor in the middle of a tilled field might be one.  So is a military vehicle in a desert.  So are commercial and military sea vessels and aircrafts.  Any source that emits carbon dioxide away from nearby plants potentially contributes, essentially.  Industrial smokestacks in particular.  The smokestacks tied to coal power stations, metallurgy, and other industrial activities are likely why fossil fuels contribute so much.

Smokestack output could be sequestered using a rocket mass heater (Wheaton, 2009) like setup if carbon dioxide was a concern.  Such a setup would do away with purifying carbon dioxide, which is hard, and transporting and storing it, which are dangerous.  Instead, capture the output as is, and process it as relevant.  Put the heat to good use, like urban heating or drying wood pellets.  Then pipe the output towards plants using a setup that borrows from drip irrigation and open air carbon dioxide enrichment experiments (FACE).  Hemp is able to soak up toxins without compromising its industrial uses (De Vos et al, 2022), which include construction, plastics, and paper.  Streaming the output towards ponds would work too.  Duckweed grows fast and feasts on sewage.  It's a promising option to make biofuels (Yang, 2022).  When not laced with toxins, it's also a protein-rich chicken feed (Demann et al, 2022).

Alternatively, letting the carbon dioxide escape into the atmosphere would work too.  The yearly carbon dioxide fluctuations (NOAA) make clear that plants have no problems with it soaking up. What makes carbon dioxide levels tick up each year is likely the fact that photosynthesis is low during winters in the northern hemisphere, where most industrial farmlands are. That would leave enough of the autumn plumes around that winter winds then carry away some of that carbon dioxide. The concentration would quickly drop back to pre-industrial levels if those autumn farming plumes got curbed enough to not leave much carbon dioxide around to disperse. So the current atmospheric carbon dioxide level is no cause for concern.

## Conclusion

To wrap up, we've shown that the carbon cycle fails to represent surface level interactions properly, and that this keeps biogenic plumes of carbon dioxide out of scrutiny. We've then brought up that the carbon accounting framework is being used to justify all sorts of specious activities, even as those avoidable plumes make global industrial emissions look negligible. Lastly, we've put forward a canopy loss based explanation for the modern rise in atmospheric carbon dioxide. In doing so, we've highlighted simple ways to curb this rise, and suggested a way to capture and sequester the carbon emissions of industrial smokestacks. It is safe to assert that plants will soak up this carbon dioxide, but further research would be needed to confirm how well these solutions curb the aforementioned plumes.

The energy that has been poured into climate science to date makes it fair to raise that the carbon cycle and the carbon accounting framework shape conversations without their users noticing. Whether these concepts have been designed to be scientific examples of Orwellian Newspeak is worth asking. Undecided readers may want to look into the pied pipers (Cudenec, 2023) who are manipulating activist groups (Morningstar, 2019) before their disturbing agenda (Corbett, 2017) catches up with them (Bezmenov, 1984). Or into why climate change looks eerily like man-made desertification (Weiss, 2023c; 2023b; 2023a) and other factors (Ball, 2022) that are no cause for concern, such as volcanic activities (Kamis, 2023). Or into what forest mismanagement (Lindenmayer et al, 2023) and stratospheric releases of coal fly ash (Herndon & Whiteside, 2018) do to wildfire risk.

Nature conservation offers many other examples of conversation shaping idioms. To wit, white ranchers explore and hunt game, but black herders encroach and poach bushmeat. The field oozes of dubious concepts like non-native species (Chew, 2021) — as if nature was a static museum rather than a dynamic system. It obsesses with locking up and protecting nature like a patriarch would of a feral daughter. Its religious roots (Corry, 2017a) betray that it is in fact the authoritarian land steward's alter-ego. One enslaves nature. The other inverts that reality by worshipping it. Both set boundaries to keep their context at bay. Both suppress that context out of existence in their zeal to keep it check. Both fuel alienation and produce scarcity for that reason.

Nature conservation crumbles at once when you remark that humans are natural. If anything, we are the planet's most important keystone species. Learning how to work with nature (Mollison, 1994) is not difficult. Doing so produces ridiculous abundance (Osmond & Wilson, 2021). In due course, it creates abundant landscapes that many think of as "wilderness." To authoritarians, "wilderness" means nature that's not (yet) under (their) tight control. To others, it's nature loved and cared for the way she is, if nudged in desired directions at times, and embraced for her fertility. To indigenous peoples, it's simply home … provided that nature conservancies don't pull off the biggest land grab in history (Survival, 2022).

The climate narrative makes more sense once you begin looking into these religious underpinnings, that land grab, and how they feed into the carbon based profiteering laid out in these pages — and other nature-based asset classes (Hache, 2019; Webb, 2021). In passing, it should give us all pause that elites are pouring cash into conservancies. Tax exempt nonprofits are a great way to stash assets. They're a better one still when they're trusts (with pray tell who as secret beneficiaries) that stand to pocket green tithes for controlling a large chunk of the planet. Elites will have the last laugh if their controlled opposition puppets (Morningstar, 2019) get their way.

In the end, the green agenda neatly illustrates the adage that propaganda is as much about controlling what people think as it is about controlling what they think about. This paper won't stop the agenda any more than the earlier papers that should have. But it opens a new venue to defeat it in court. Jargon can overwhelm non-experts, so fear, appeal to authority, and the precaution principle all play into the hands of the propagandists when discussing climate science. The carbon accounting chicanery that the policies build on, by contrast, is straightforward to understand. The textbook case of accounting fraud and the shameless profiteering make the carbon accounting indefensible in court.  A crowdsourced legal effort (de Bernardy, 2023) is under way to detonate green finance on that basis.

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