LETTER TO THE EDITOR

It’s time to stop pretending burning forest biomass is carbon neutral

The opinion piece “The climate change mitigation effect of bioenergy from sustainably managed forests in Central Europe” by Schulze et al. (2020) argues against putting forests into conservation, concluding that managed forests can help mitigate climate change more effectively than unmanaged forests mainly due to the potential to use end of life wood products as fuel. This is alleged to produce “emission savings” by substituting diesel or other energy use. However, we question some of the assumptions upon which this conclusion is based.

The article by Schulze et al. contains a subheading, “Carbon Accounting for Climate Change Mitigation,” but the authors did not do full carbon accounting, instead ignoring biogenic CO₂ from combustion and only counting fossil life cycle emissions associated with manufacturing and transporting biomass. While they admit that “this approach can be criticized for not accounting real emissions that take place in combustion,” they rationalize the approach by stating “The nature of the carbon cycle suggests that accounting of carbon emissions from resources of recent biogenic origin should be left out.”

But what does the fact that the carbon emissions are from resources of “recent” biogenic origin have to do with the net impact of wood combustion on atmospheric CO₂? Could not the same argument be made about emissions from trees burned in forest fires? Burning forest biomass emits more CO₂ per unit final energy than burning fossil fuels, and a number of studies have shown that cumulative net emissions can exceed those from fossil fuels for decades to more than a century (e.g., Holtsmark, 2012; Laganière, Paré, Thiffault, & Bernier, 2017; Mitchell, Harmon, & O’Connell, 2012; Walker, Cardellicchio, Gunn, Saah, & Hagan, 2013). What matters to net atmospheric impact of an action is not how recently carbon was sequestered, but the net emission compared to the counterfactual (what would happen in the absence of that action), taking all significant fluxes into account in both scenarios.

Additionally, in calculating the “benefit” of burning biomass, the authors appear to subtract out the emissions of the alternative energy mix (for electricity) or diesel (for heating) that they assume would be used if wood were not being burned, further obscuring the real emissions impacts of bioenergy. However, any substitution benefits of using bioenergy instead of fossil fuels are properly included in the energy sector accounts, and should not be double counted in the land use accounts. Nor is it reasonable to assume that biomass always substitutes for fossil fuels. Based on the targets of the EU’s Renewable Energy Directive and associated financial incentives, it is likely that biomass often displaces non-emitting renewable energy technologies, missing opportunities to reduce atmospheric CO₂ further.

The piece draws a number of other conclusions that are not backed up with citations, or very selectively chosen ones. One of the biggest is the claim, based on personal communication, that soil carbon loss from disturbance during harvesting is no longer an issue due to improved harvesting techniques, despite contrary conclusions from published reviews (Mayer et al., 2020). The authors use this to justify focusing exclusively on aboveground carbon stock differences between managed and unmanaged forests, hence excluding belowground biomass. However, even if this is justified, the sole focus on aboveground biomass disregards studies that found significant net emissions (Booth, 2018) and total ecosystem carbon losses from harvesting forestry residues (Achat, Fortin, Landmann, Ringeval, & Augusto, 2015; Hamburg, Vadeboncoeur, Johnson, & Sanderman, 2019; Repo, Böttcher, Kindermann, & Liski, 2015).

The piece concludes, “In this study, we show that the regional climate change mitigation potential of sustainably managed forests is about 10 times as high as that of forests taken out of management, based on the lifetime of trees under unmanaged conditions. The difference is mainly due to the substitution effect from the use of discarded wood products as feedstock for bioenergy.”

Few dispute that harvested wood products may play some role in climate mitigation, but Schulze et al.’s conclusion of a 10× factor for climate mitigation in managed forests depends on carbon accounting sleight of hand (not counting biogenic emissions and not including all carbon pools), large substitution effects and not including the time difference
between emissions and regeneration. Unfortunately, it is likely to be cited in support of increased harvesting by those who crave access to Europe’s last remnants of untouched natural forests.

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