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On the Role of Forestry in Climate Change Mitigation

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Long-standing debates over the benefits of forest conservation vs. those of substitution and forest resource use continue to occupy attention in Europe and beyond. Moreover, many argue the carbon sequestration benefits of standing forest are greater than those from forest resource use and replanting. To study this question, we generate long-term scenario analyses based on different forest management strategies in Sweden, in particular comparing increasing forest use and increasing land set-asides over 100, 200 and 500 year cycles. We find that the cost of increasing land set-asides is reflected in a significant loss of the carbon benefits created by forest use (substitution and carbon sequestration). We explain this outcome through the loss of additional growth that occurs as forest in land set-asides matures and eventually reaches a steady state. For the Swedish forest, these costs are significant and may amount to the loss (lost opportunity) of annually providing and additional -14 MtCO₂e in net annual removals. The EU-based LULUCF carbon accounting framework, however, does not recognize this benefit and thus may effectively encourage land set-asides at the expense of real, measurable forest and forest resource-based climate change mitigation.