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## There is no alternative to forest management

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Naudts et al. [1] present a study on Europe's past forest management (FM) and conclude a climate warming effect. We want to make a point on technical limitations of reconstructing Europe's FM and on the omission of substitution effects, which severely challenge the conclusions of the study.

- (i) The authors admit in a former study [2] several limitations on the reconstruction of FM: 1) Lack of comprehensive data to parametrize and validate past FM [p4295&p4299]. 2) Reconstruction before 1828 is hypothetical, representing only how much forest would have been required to satisfy the unknown and therefore assumed wood demands [p4291]. 3) Spatial & temporal representativeness remains unknown as the data are mainly based on local case studies [p4310].
- (ii) No information is provided about the important initial stocking (and thus carbon) densities assumed for the forests in 1750 - unmanaged forest as well as widely degraded forest. Paintings at this time indicate low carbon densities (see [3]).
- (iii) Poor representation of forest sites, stand structures, and silvicultural interventions (e.g. only clear cuts) - although decisive for water balances.

Furthermore it is crucial to make explicit alternatives to FM, which could have satisfied the former raw material demands. For a sound statement on the effects of past FM on mitigation of climate warming the avoided emissions due to the substitution of fossil fuels and of energy intensive materials (e.g. bricks, concrete, steel) by timber has to be taken into account as well.

The misleading [see 4, 5] conclusions interfere modern FM as one of the most powerful short term biological carbon capture and storage means with a global mitigation potential up to 1,6 Gt C/yr in 2030 [6]. Finally, recent high resolution observational data document a permanent cooling effect of forest regrowth areas in temperate zones throughout the year [7].