

## ***Interactive comment on “Carbon stocks and dynamics at different successional stages in an Afromontane tropical forest” by Brigitte Nyirambangutse et al.***

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This manuscript fills an existing gap about the carbon pools of African montane forests of different stages from early to late succession. The authors have applied up to date methods to determine the above- and belowground biomass and productivity and soil carbon pools and found that the late successional forests investigated have higher carbon pools than montane forests in S-America and SE-Asia. The manuscript title clearly reflects the content, the abstract gives a nice overview and summary. The paper is well structured and presented, written in fluent and precise English. Formulas and abbreviations are correctly given and used.

The methods are in general clearly described with only view details, that should be  
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clarified: In the description of the study area and the plots I was missing information about the slope inclination and topographic position of the plots. Only the planimetric area is given, but especially the topographic position (ridge, valey bottom) would be an interesting information, as it is known to have an important influence on forest structure. Later in the methods it would be good to clarify that all area-based results (biomass, NPP, C-pools) are related to the planimetric area and not to the inclined area.

In section 2.3 Meteorological data the authors list . . . air humidity, solar radiation, humidity . . . Please clarify what is meant by “humidity”, maybe soil moisture? A list of meteorological parameters that were measured are not presented like solar radiation, soil temperature and moisture. So, I would like to ask the authors to present these data. The authors used ingrowth cores to quantify the fine root production. I was wondering if they determined the lack time between installation of the ingrowth core and the time when roots started after the disturbance to grow inside the root free soil cores. Please clarify if you determined the lack time and subtracted these periods for annual fine root productivity, or if you didn't.

The results are well and traceable presented and support the conclusions. I In Tab 2 – 5 I would like to ask the authors to present also the results of the intermediate successional plots MS. To me that information would be of more interest than the total mean and SD of all 15 plots. In line 2 of Table 6 “America b” is missing after C&E. And please replace Clumsee et al. by Culmsee et al. On page 12 lines 14-15 it remains unclear if the given recruitment rates refer to the above mentioned species or not.

Putting their own work into the context of published studies the authors clearly indicate the origin of the data. Only a view studies are missing in their review on forest structure and above and belowground biomass. Here the authors should include additional results from SE-Asia from Hertel et al. 2010 Forest Ecology and Management and from Kessler et al 2012 PloSOne. On page 14 line 29 it should say “ M. kilimandscharica”

The supplementary material presents important detail information and is well pre-

sented. In Table S3 please correct in the first line "species abundance". In Fig S1 please give also  $R^2_{adj}$  when non-linear correlations were applied. This manuscript will be an important contribution to Biogeosciences as the results fill still existing gaps about the C pools and dynamics of Afromontane forests of different successional stages. It is nice to read, well presented and comes to interesting conclusions based on a great dataset.

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