

The authors evaluated the ability of LandscapeDNDC in simulating carbon balance over different ecosystems in West Africa. The topic of this work is important, which may provide a possibility of using this model to assess the impact of land-use and climate change on the regional biomass productivity. I have some comments which may improve the manuscript to a certain extent.

Specific comments:

Lines 203-207: Does the author validate the MODIS LAI data with field measure LAI in the studied sites?

Lines 209: I would put some key functions, such as the calculation of water stress factor, in this section.

Some results were not fully discussed. For example, in Figure 1(A), the LAI was overestimated in 2007 and the NEE was overestimated at the very beginning of the growing season.

Although this manuscript focus on evaluating the ability of LandscapeDNDC in simulating gas exchange and biomass production simulation, the simulation of soil moisture is very important especially in some arid or semi-arid sites (such as Agoufou, Dahara, and Wankama). Do you have the field measured soil moisture? If you have, I suggest the author validate the simulation of soil moisture of LandscapeDNDC.

For the validation of NEE, I would like to partition NEE into gross primary productivity and ecosystem respiration. After that, the gas exchange part can be in-depth discussed.