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We thank the reviewer for the thoughtful comments and suggestions. In the following, please find out point-to-point response to the reviewer's comments, with the original comments in black font and our responses in blue:

The manuscript provides a simple algorithm for diagnosing changes in cropland area under different socioeconomic and climate scenarios. The aim of the manuscript is important, particularly the separation of changes attributable to changes in climate and those attributable to socioeconomic changes. However, the study doesn't provide sufficient information to assess the reliability of the results. I have two main concerns with the analysis.

Major concerns:
1. Not enough detail is provided on the performance of the DSSAT model as compared to FAO data. The process of calibration is clear, but the outcome is not. For example, a figure similar to figure S2 in Ahmed et al., 2015 showing the FAO yield data and DSSAT calibrated data for major crops in strategic countries would be immensely helpful to readers when evaluating the reliability of the model yield results.

Response: In Ahmed et al. 2015, DSSAT was calibrated to improve the model performance in capturing the present-day average (1980-1998) of country-level yield. While the calibration process enables the model to reproduce the FAO data, it does not have any noticeable effect on the time-series of crop yield. Because, the calibration was mainly performed adjusting the nitrogen fertilizer input, and the magnitude and the direction of the adjustment were similar for the entire time-period. Therefore, the calibration does not affect the inter-annual variability of yield, and the time-series before and after calibration follow the same pattern of variation. To clarify this, in the manuscript we added the following sentences on the outcome of the calibration:
Lines 166-168: "This calibration of the cereal crop models was based on tuning of the nitrogen fertilizer input, which dramatically improved the agreement between DSSAT and the FAO data on the country-average crop yield."
Lines 173-177:"Note that these approaches, both the model calibration for cereal crops based on the Ahmed et al. (2015) and the scaling of the cassava and peanut yields for bias correction, focus on getting the right long-term mean of crop yields. Differences in the inter-annual variability of crop yield between DSSAT and the FAO data remain, and are difficult to address due to the impact of human factors as discussed in Ahmed et al. (2015)."

2. The authors need to justify points 1 and 2 in the decision-making algorithm, or perform sensitivity analyses similar to those used in points 3 and 4. I appreciate that a number of sensitivity analyses have already been performed, but without a strong justification or understanding of the sensitivity of the model to this assumption, it's not clear how much confidence we can place in the results. Particularly because this is the first step in the algorithm, and therefore affects all downstream results. The authors cite Burney et al. (2010)

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and Hurtt et al. (2011) when indicating that cropland conversion happens at the expense of forested area, but Hurtt et al. (2011) conduct a sensitivity analysis on choice of primary or secondary land converted, and Burney et al. (2010) assume that future cropland conversion will occur in proportion to past cropland conversion (not solely at the expense of forests, but instead following Ramankutty and Foley 1999). Both citations indicate a decline in forested area, but do not indicate that cropland expansion occurs solely in forested areas.

Response: Point well taken. To address this comment, we have performed additional analysis to assess sensitivity of LandPro to this assumption of the algorithm. The results are documented in the newly added Figure 8 in the revised manuscript. Corresponding description and discussions have been added to the manuscript (Lines 371-377).

Specific points

- Why were MIROC and CESM chosen from the CMIP 5 archive? How do they compare to other CMIP 5 models in simulating the climate of West Africa over the observational record

Response: Point well taken. In capturing the present-day vegetation distribution in West Africa, while driven with MIROC-ESM and CCSM4, the CLM-CN DV model performed better than other GCM-driven runs (Yu and Wang, 2014). Therefore, we chose MIROC and CESM, which is the updated version of CCSM4. We have added this clarification in the revised manuscript (Lines 190-193)

-What is driving the differences in Hurtt et al. (2011) and LandPro-SE? This is an important point to discuss since readers need to know the benefits and limitations of each product when weighing the plausibility of each potential outcome.

Response: Accounting for climate change impact on agricultural land use explicitly in the LandPro algorithm by incorporating the climate-induced future changes in yield is the major difference between the LandPro simulations and Hurtt et al. (2011). In the LandPro_SE algorithm, however, the climate-induced changes in yield are ignored. Therefore, the main difference between the LandPro_SE and Hurtt et al. (2011) would be represented by the consideration of probability of changes in land use types in projecting the future trends of land use. The changes in land use from one type to another between two time steps according to Hurtt et al. (2011) significantly depends on the probability of particular types of land use changes in previous time steps. However, in the application of LandPro in this study, the future crop area expansion was projected between two time slices, which are several decades apart, without considering the transient processes in land use dynamics. These are mentioned in the manuscript (Lines 383-392).