

## ***Interactive comment on “Implications of land use change in tropical Northern Africa under global warming” by T. Brücher et al.***

**Anonymous Referee #2**

Received and published: 14 October 2015

General remarks: =====

In this study the effect of different types of land use - crops versus pasture and different harvest rates - on climate change in sub-Saharan northern Africa is investigated by a series of sensitivity experiments with the MPI Earth system model. The research issue is very interesting, the hypotheses sufficiently novel and the experimental design consistent. I support publication with only minor revision according to two general and some specific remarks.

- 1) Please improve language style by correcting the typos and some inaccuracies in the text (partly see below).
- 2) Some of the statements are stronger than can be justified from this analysis. E.g. on

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page 12, line 4, it is concluded as a key message "that there is presumably no impact of land use on climate". The truth is that this study has shown that in the context of climate change it doesn't matter whether land use consists of agriculture or pasture. Whether land use has an impact on African climate change or not could be assessed by model experiments without any land use or without man-made land cover changes during the 21st century. In addition the link of the considered land use scenarios to conflicts is not very obvious. Conflicts in Africa often imply that man-made land cover change is substantially accelerated due to uncontrolled settlement of refugees in one region or by complete abandonment in other regions. This would affect the transformation rates from natural to managed land which are prescribed by the RCP scenarios and not modified in this study. I suggest to make more moderate statements in this respect.

Specific remarks: =====

- 1) Abstract: I do not understand the last sentence of the abstract and how it is concluded from the statements b
- 2) Page 3, lines 20-25: Following the argumentation in this paragraph one would expect that the authors object to underlying assumption of former studies by using e.g. daily extremes. However, they even use annual instead of monthly or seasonal means, assuming that farmers can even cope with climate anomalies over such long time periods. This assumption should be supported by some references or further discussion.
- 3) Page 14, line 7: at a prescribed ... what?
- 4) Page 6, line 18: Table 1
- 5) Page 8, line 4: the spatial distribution of ... what?
- 6) Fig. 3: Is there a reason why differences are plotted against the period 2006-2035 instead of using a period the 20th century as a reference which is less affected by climate trends?
- 7) Fig. 4: The quality is bad and does hardly allow for distinguishing between dashed,

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dotted and solid lines.

8) Fig. 6: Same quality problem as in Fig. 4 and the labels a-f are missing.

9) Page 11, line 8-9: (not shown) ... Isn't this shown in Fig. 7f?

10) Reference list: Please check whether Claussen et al. 2014 is cited in the text.

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Interactive comment on Earth Syst. Dynam. Discuss., 6, 1101, 2015.