Earth System Dynamics
Discussions

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Interactive comment on "Current challenges of implementing land-use and land-cover change in climate assessments" *by* R. Prestele et al.

Anonymous Referee #2

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Review esd-2016-39: Current challenges of implementing land-use and land-cover change in climate assessments

The authors discuss in their manuscript the major uncertainties and shortcomings associated with the implementation of land-use and land-cover changes (LULCC) in climate change assessments. Additionally, three major challenges are identified and the reasons for them are discussed.

General Comment: Generally, I think this paper raises some important issues related to implementation of LULCC in the modelling community. Raising awareness to this issues with the help of an extended literature review will be beneficial in tacking this problems. However, I think the manuscript would benefit from not only raising awareness of the issues and the reasons behind it but also providing a 'way forward'. This

is sometimes done in the individual sections but I think the suggestions get lost in the wealth of information presented in the manuscript. I therefore suggest adding a separate recommendation section in which the authors clearly state in short and precise form what could/should be done to overcome the challenges and which part of the community they see in a better position to take the lead (if possible), instead of having the conclusions and recommendations combined in one section. The abstract and P3L5-10 ('overall objectives') do not match. Please make sure that these points are consistent throughout the document.

This brings me to my general comment; The paper covers a lot of material but very often the structure of the document gets lot. I therefore suggest the authors to go through the document and make sure that the reader can follow the train of thought easily. This could be achieved for example by adding subheading to the sections and having a similar structure within each of the sub-sections. This also applies to the Supplements which should also convey a clear structure within the sub-sections.

Specific Comments: In the title of the manuscript it should become clear that the document is about 'anthropogenic' land-use and land cover changes and that the assessments are with regard to 'climate change'. I therefore suggest revising the title.

P1L20-23: Suggested to split sentence

P2L22-26: I think as this is an interdisciplinary journal, it would be beneficial for readers outside of the community, if examples of the uncertainties could be given (e.g. it might not be clear to the readers what 'definition issues' are (see also P5L 16)).

P3L1: which 'sources'? Please specify

P3L27-31 Please be more specific and elaborate on the dataset

P4L6&L9: What does 'LUH' and 'HYDE' stand for?

P5L18: 'large differences' in which variable?

P5L23: what are the 'all relevant processes' to the authors? Elaborate. What is still missing.

P5L26: It is not clear what a 'marker scenario' entails

P5L33: 'large variations' in which variable?

P6L5: The differences in output arising from different models the input and calibration etc. is not only an issue in the assessment of LULCC but generally applies to all models... Maybe if you look at other modelling communities and how they quantify these uncertainties.

P 6L11: the problem is how to define 'plausible' realisations.

P7L 2: Elaborate why sub-grid dynamics 'have been shown important'.

P7L6: what are 'under-determined mathematical systems' in this context?

P7L8: what are 'minimum-transitions' in this context?

P7L21-23: Rephrase sentence

P10: rephrase 'allocation issue' do you mean the shifts between the communities and their perceived responsibilities

P10 Maybe you would like to add to your discussion that 'satellite data' is also not 'directly measured data' but also goes through a mathematical conversion process.

P11L24: Can you elaborate what 'improved communication' should entail in an ideal case. Additionally, I think it is not only the 'understanding' but first the 'awareness' of different assumptions and constrains needs to be achieved and before one can understand and tackle the problems.

Figures: P24: add a 'log' label to the legend and add colour areas without change in grey to make the light yellow areas better stand out.

Supplement SP2L7: can you provide more details on the updated version, i.e. refer-

ence

SP5: Can you comment on the uncertainties associated with the CORINE data

SP6L8: Can you elaborate on what the 'thematic accuracy' entails.

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