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Interactive comment on "Continuous and consistent land use/cover change estimates using socio-ecological data" *by* Michael Marshall et al.

Anonymous Referee #1

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Anonymous reviewer recommendation – "Continuous and consistent land use/cover change estimates using socio-ecological data"

This study develops a new method of improving LULCC estimates for the land model community. This method has continuous 30-year estimates of LULCC driven by socio-ecological geospatial predictors over some parts of Africa (Kenya). In addition, machine-learning technique is used to analyze 2,252 5x5 km2 sample frames. They argue that a socioeconomic variable can be utilized to reconstruct the LULCC estimates and also the non-remote sensing predictors in all cases out-performed that from remote sensing approaches (products).

While this study points an interesting and important issue of using gridded socioeconomic data in mapping LULCC in Kenya, the argument in this study can be broader.

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Discussion paper

Overall, the findings presented in this paper may be of interest to the community. There are several aspects that need to be addressed before the paper is accepted. Please see below for detailed comments.

Major comments:

1. Usually, the remote sensing product (approach) has the advantage of wide coverage (usually globally). This study tries to demonstrate the accuracy and performance of continuous and consistent land use/cover change estimates via using non-remote sensing socio-ecological data. I believe when we have very detailed local datasets that usually result better performance; however, more importantly, how can we expand such approach globally? The authors may want to address this issue (the implication of this approach) more detail in the discussion.

2. Fig 5 is an interesting figure showing the advantage of the non-remote sensing approach. I am wondering why the remote sensing approach has lower MSE, when the # of predictors is smaller than 4? Can the authors be more specifically on how/why the remote sensing predictors have some advantage compared to the non-remote sensing approaches when the predictors are small (< 4)? Also, will it be possible to use such approaches to validate the remote sensing's LULCC product? Especially, when the # of predictors are larger than 10?

3. In addition, I think that combining both the non-remote sensing and remote sensing data will be an important result. The authors may want to show such figures as it is not shown in current version of manuscript: "An analysis of the non-remote sensing and remote sensing predictors together (not shown)"

4. Page 20, Line 13-17, the first paragraph of the discussion, the authors mention "non-remote sensing predictors in all cases out-performed remote sensing predictors."

Both methods have their pros and cons, instead of saying non-remote sensing approach is better, I would suggest the authors try to show how this approach can im-

prove the remote sensing products or vice versa when the number of predictors are small. Also, try to list the cons of the “non-remote sensing predictors” will be helpful for the readers.

5. To what extend the conclusion might be different if the target region is not agricultural production zone?

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