Responses to the reviewer

We would like to thank the reviewer for his/her thoughtful comments. We have addressed all these comments in our revised manuscript. The point-by-point responses to the review comments are provided below.

Some general comments:

- **Question 1**: My major concern is that it is rather a report of finds from readily available and published data and does not provide much added scientific value.

- **Answer**: Thank you for the comment. Although this study used the readily available and published data, it is not a simple illustration of the data. The objective of this study is to identify the high risk areas for crop production under climate change in China and to support adaptation to climate change at regional scale. Although ISI-MIP project 1 has provided the model outputs, these gridded outputs are not readily useful for effective risk reduction and adaptation strategies. The adaptation strategies are usually carried out for different regions and administrative districts. The decision makers are interested in the risk assessment at administrative areas rather than the gridded outputs. Our results provide a starting point for regional studies on vulnerability and adaptation strategies to climate change. It bridges the gap between the modelers and policy-makers. Scientists always hope the model projections could help shape climate adaptation approaches. This study demonstrates an effort at regional scale. We have clarified the objective and scientific significance of this study in the introduction section. We have also added the risk and uncertainty assessments in the administrative districts of the China in order to better support decision making at regional scale.

- **Question 2**: The title may need some adjustment. In the Discussion (P626/L3ff), the authors state that GGCMs show large differences in projected CC impacts and do not reproduce historic yields well. The title should hence include some reference to uncertainties.

- **Answer**: Thanks for the suggestion. We agree that uncertainty is very important in risk assessment and we have revised the title accordingly.

- **Question 3**: The language could be polished in various places in order to facilitate understanding.

- **Answer**: We have read through the manuscript and polished the language.

- **Question 4**: The Conclusions are rather a summary and need more elaboration.

- **Answer**: We have rewritten the Conclusions section. In the revised section, we have organized the conclusions in two respects: 1) risk of crop productions under climate and implications to agricultural adaptation strategies in China, 2) uncertainty of the assessment.

Some specific comments:

- **Question 5**: P618/L4: "… a couple of global gridded crop models …" why does this not state the number of crop models being used, which is four?

- **Answer**: We have stated the number and listed the models in the revision.

- **Question 6**: P618/L9: "… show that the potential yields of rice may increase over …" should be "… show that the yields of rice may potentially increase over …" to make clear that not yield potential is meant.

- **Answer**: We have corrected it following the suggestion.

- **Question 7**: P618/L11: should be "which" instead of "where".

- **Answer**: We have replaced "where" with "which".

- **Question 8**: P618/ L11: should say "yields" instead of "production". Production is not necessarily impacted by CC, as it also depends on the harvested area, agronomic inputs, etc.

- **Answer**: Corrected. And we have checked the use of 'yield' and 'production' throughout the manuscript.

- **Question 9**: P621/L2: "harvesting time" should be "number of cropping seasons".

- **Answer**: Revised.

- **Question 10**: P621/L15: There actually is partial adjustment in some models: GEPIC takes adaption into account in terms of decadal adjustment of planting and harvest dates and the distribution of spring and winter wheat. PEGASUS and LPJ-GUESS adjust the GDD of their cultivars. You may need to check more carefully the descriptions of models that produced the data.

- **Answer**: We have revised the descriptions and made the statements more accurate.

- **Question 11**: P622/L7: "moving average": what kind of average?

- **Answer**: In order to remove inter-annual variability of yield, we used 30-year moving average of the data. We have clarified it in the revision.

- **Question 12**: P623/L16: "This is likely due to the limitations of rice model in the GGCMs". How do you derive this conclusion? Apparently, also the other crops are not represented too well in the GGCMs in terms of reproducing historic reported yields. Besides actual crop growth algorithms, the global crop models also use different input data (e.g. soils, planting dates, growing season lengths) and various management assumptions. I'm not sure whether any conclusions on model performance in terms of bio-physical processes can be drawn from the ISI-MIP crop model outputs.

- **Answer**: Thanks for the insightful suggestion. We agree that no conclusions on performance of bio-physical processes in the models may be drawn from ISI-MIP outputs. We have rewritten the related discussions.

- **Question 13**: 626/L11: See comment on adaptation above.

- **Answer**: We have revised the statements.

- **Question 14**: P627/L8: The conclusions should draw new findings or provide an outlook on what further research or policy decisions, etc. may be needed in the future based on what has been presented and discussed in the foregoing sections. This Conclusions chapter however is rather a summary that has already been provided in the abstract.

- **Answer**: Agreed. We have rewritten the conclusion section following the suggestion. Please see the answer to Question 4.

- **Question 15**: P628/L10: various names in the references have been misspelled (e.g. Challiore, Izauurade, Lobel). The authors for "Future scenarios of European agricultural land use …" are not correct. The authors should check all references carefully and correct them where necessary.

- **Answer**: We have checked the references throughout the manuscripts and corrected the misspells. Some modifications are shown as follows:

P628/L26: "Challiore" has been changed to "Challinor"

P629/L17: "Khabarow" has been changed to "Khabarov"

P629/L21: "Glotter, M." has been changed to "Kelly, D."

P629/L24: "Elliott, J. Glotter, M., Best, N., Wilde, M., Glotter, M., and Foster, I." has been changed to "Ewert, F., Rounsevell, M. D. A., Renginster, I., Metzger, M. J., Leemans, R."

P630/L11: "Izauurade" has been changed to "Izaurralde"

P631/L13: "Yong, H." has been changed to "Hong, Y."

P631/L15: "Yong, H." has been changed to "Hong, Y."

P631/L18: "Yong, H." has been changed to "Hong, Y."

P631/L24: "Lobel, D. B." has been changed to "Lobell, D. B."

P632/L15: "Kin" has been changed to "Kim"

P633/L8-L10: have deleted "Rodomiro, O. ……, 2008."

P633/L13: "Yong, H." has been changed to "Hong, Y."

P633/L19: "W arszawski" has been changed to "Warszawski"

P633/L30: "Yolozawa" has been changed to "Yokozawa"

P634/L1: "Tornton" has been changed to "Thornton"

P634/L6: "Wahaa" has been changed to "Waha"

P634/L14: "Pontek, F." has been changed to "Huber, V."

P634/L14: "Research Design of the Inter-Sectoral Impact Model Intercomparison Projection (ISI-MIP)" has been changed to "The Inter-Sectoral Impact Model Intercomparison Projection (ISI-MIP): project framework"

P634/L27-L28: have deleted "Xiong, W., Balkovic, J., ….., 2014."

P635/L1: "Yand" has been changed to "Yang"

- **Question 16**: References: Xiong, W. et al. (2012) Untangling relative contributions of recent climate and CO_2 trends to national cereal production in China. Environ. Res. Lett. 7 044014

- **Answer**: It is a closely related reference and we have added it in the revision.