Reply to Referee Report 1:

We thank the referee for spending time on this lengthy paper and providing invaluable comments on it. We have made careful considerations and now reply to the comments one by one.

1. The MS is too complicate and cover many topics. It likes a project report submitted to a funding agency. To be a journal paper, the MS needs substantial revision and to be focused on key issues:

Agree. This comment will be followed closely in revision so that a concise paper focusing on key issues is produced;

2. There are too many maps, their presentations are verbose and distract readers' attention:

Agree. We will make a careful selection of the maps to be included in the revised version of the paper. We will also consider making additional maps available as supplemental online material if necessary;

3. The MS is poorly motivated. In introduction section, the first 2 paragraphs are about the challenges of global food security and further challenges from climate change on global food production and natural resources. Then the third paragraph suddenly moves to: "The focus of this paper is the projected impact of climate change on Chinese Food security through 2050". "The focus of this paper" in China OR China's food security OR impacts of climate change on China's food security comes from nowhere:

You are right that the motivation was not well stated in the introduction. The Chinese context of food security was indeed missing from the current introduction section. We'll consider merging the second section of the MS into the first, arriving at a logically coherent concise section of introduction;

4. The MS is poorly organized. I do not want to comment each section. Here I also use introduction section as an example. After stated the focus of this MS, in the 4th paragraph, the MS turns to definition of "climate". And then discusses vulnerable of agriculture in the 5th paragraph. Readers now are completely lost what the MS is going to talk. Even more confusing is that introduction section is ended by a new sub-section on "Regional Impacts of Climate Change":

Thank you for pointing out the problem of improper organization of the texts for us. In addition to actions considered above, we'll consider removing this particular subheading "Regional impacts of climate change". Its content will be merged into other parts of the MS if necessary;

5. Within each section, the MS looks like putting several pieces together, not really telling story or stories. For example, section 2 reviews China's population, income growth and

vulnerability, and then followed by land use and agriculture with several maps and figures as well as tables. The readers would ask questions: Why the MS discusses these? And so what? These are not clear:

The intention of section 2 was to provide Chinese context for the discussion of food security under climate change, in addition to the global context given in section 1. Following your comment, the authors will consider merging these two sections together to produce a new, concise introduction section;

6. Section 3 is more confusing. The section is titled "Scenarios for Adaptation". But the first sentence of this section goes: "The current status of the country with respect to vulnerability is reviewed in this section. This includes a brief overview of current population trends, per capita income growth and its distribution, and the state of agriculture". The readers of this MS would be totally confusing what the section is about. Moreover, the rest of this section is about biophysical scenarios, social-economic scenarios, and crop-specific scenarios. These are clearly not adaptation scenarios:

We accept your critique here. Section 3 was to discuss climate scenarios as the outcome of specific GCMs, and scenarios of agricultural production (e.g., crop area) under climate change (this was where the word 'adaptation' originated), followed by IMPACT model simulated outcomes (yield, production, food self-sufficiency, etc.). We will reorganize this section so that the methods used and the results obtained are shown clearly.

7. Section 4: "Agriculture and Greenhouse Gas Mitigation." According to the MS, "The focus of this paper is the projected impact of climate change on Chinese Food security through 2050". Why the MS has this section? Whole section is not relevant to the objectives of this study:

The original reason for including mitigation was that we wanted to cover the range of climate change issues associated with agriculture. Agricultural GHG emissions are significant, even in developing countries, and will grow rapidly unless we get farmers to adopt technologies that raise productivity without emissions growth. And agriculture can also capture emissions from other sectors, in the form particularly of soil organic carbon, which is also good for productivity. The logical link between mitigation and food security will be strengthened in the revised version.

8. Section 5: "Conclusion". Implications seem come from nowhere. The MS concludes that climate change has little effects on China's agriculture. Then the MS states: "the first implication is the importance of crop breeding for food security under climate change." Where is this from? "The second implication is on the role of international trade in climate change adaptation." Again, I did not find any results from this paper on the impacts of international trade:

Your critique is well received. In response, we'll consider revise the policy implications section by highlighting the links between the policies and the results obtained from this modeling research. As also suggested by the other referee, the discussion of international trade in China's adaptive capacity to climate change will be strengthened;

9. If one looks at the issues discussed across sections, each section likes an independent paper. There is no clear linkage among 5 sections. As also mentioned in the previous comment, the authors even did not look at their results when they prepared the conclusions and policy implications:

Thank you for pointing out the organizing deficiency of the MS for us. One of the revisions considered in response to this particular comment of yours is to reorganize the text so that the sections of the revised paper are more logically linked;

10. After I reviewed the structure of this MS, now I turn to check assumptions on GDP and others in 2010-2020, I read "despite China's much more rapid growth than in the U.S. its per capita income in 2050 is till only on-fifth of that in the U.S." (page 32), which is surprising to me and made me to think whether or not to keep reading the methodology and results of MS. The authors should read some recent publications or working papers on projections of China's economy in the coming decades. As I know, China's per capita GDP was more than 1/9 of that in US in 2010:

The GDP numbers are from other well-respected scenario efforts including the Millennium Ecosystem Assessment and the World Bank report on climate change adaptation. We checked the GDP numbers again and did not find errors. We all know that the future is uncertain so perceptions of future trends of GDP growth are essentially scenarios instead of observations. If we look at the per capita GDP number in 2010, the latest World Development Indicators show that China's per capita GDP (=2427) was only 1/15 of that of the USA (=37330) or less.

The Authors

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