Anonymous Referee #1 Received and published: 16 November 2016

General Comments:

This manuscript investigated the water footprint of crop production for different crop structures in the HSP based on the statistics data of crop yield, crop acreage, fertilization and water withdrawal in 2012. The water footprint was decomposed into blue water footprint, green water footprint, and grey water footprint. Eight different crop structure planning scenarios were used for the assessment of water footprint for different crop structure. Although in my opinion the subject of research is interesting and may be helpful for the water resource management in the HSP, there are several important issues need to be addressed. So I recommend a major revision. Major points:

Response: Thanks for the reviewer's comments. After our careful modification for about two months, we resubmitted the manuscript. The responses of the comments are as follows,

1. The language of the manuscript needs to be improved, since some sentences are too long and not well expressed. I would suggest the manuscript refined by a native speaker.

Response: We have invited an Elsevier editorial company to modify this manuscript, but until now there is no feedback, we will attach the modified file a few days later.

2. In my opinion, the result in section 3 is rather brief, which is not robust enough for the publication in this high-quality journal. The study of water footprint for only one year (2012) is obviously lack of persuasion. I suggest extending the length of time series (such as 5 or 10 years) to compare the interannual variability of water footprint in the HSP.

Response: This advice is good, we have extended the time series from 2000 to 2012 and analyzed the temporal variability of WF in the HSP. Over the past 13 years (2000-2012), the total WF of crop production in the HSP was 604.8 km3, including 288.5 km3 WFblue, 141.3 km3 WFgreen and 175.0 km3 WFgrey, which decreased 22% (from 53.7 km3 to 41.8 km3), 26% (from 26.5 km3 to 19.7 km3), 14% (from 11.7 km3 to 10.1 km3), and 23% (from 15.5 km3 to 12.0 km3), separately from 2000 to 2012 (Fig. 3). The main reasons for the downtrend of WF was the development of urbanization took up a lot of farmland and the decrease of the winter wheat planting area. In addition, the total WFblue of these crops was about twice as the total WFgreen, and the total WFgrey was slightly more than the total WFgreen.

3. The scenarios setting of crop structure has a large impact on the results. Why choose eight scenarios rather than ten scenarios in this study? My question is whether or not these eight scenarios represent all possibilities of the crop structure. In addition, why cotton and peanut are not involved in the scenarios setting (Table 2)? Do they show little impact on water footprint in the HSP? Please clarify it.

Response: Good question. The scenarios were set according the crop structure change from 2000 to 2012 and considering the high underground water consumption of rice and winter wheat per unit and the lifestyle based on pasta of the local residents. In these 13 years, the planting area of

winter maize-summer maize had a downtrend and it decreased about 35% from 2000 to 2012; rice decreased 31.61%, spring maize increased 34.13%, vegetables increased 26.05%, fruiters increased 33.04%, separately, while cotton, peanut and others had a little change.

4. The conclusion (section 5) is too simple and less appealing to the readers. Please re-organize this part to highlight your innovation and new findings.

Response: The conclusion was modified and summarized the findings of this study. "This study analyzed the WF of crop production in the HSP, and evaluated its temporal variation from 2000 to 2012. In the 13 years, the main crops production consumed about 604.8 km3 water, with 288.5 km3 of groundwater, and the WF of the crop production showed a downtrend yearly. In the local main crops, winter wheat, summer maize and vegetables are three leading crops, their WF, WFblue, WFgreen and WFgrey accounted 76.2%, 73.7%, 74.2% and 81.6% of the total, respectively.

In this region, adjusting crop farming structure was an important means to protect groundwater resources, so we evaluated the reasonable farming structure by scenario analysis of the main crops WF in this plain and suggested that: with about 20% of arable land cultivating winter wheat-summer maize in rotation, 40% cultivating spring maize, 10% cultivating vegetables, 10% cultivating fruiters, without rice and other crops unchanging (i.e. scenario 6) were available to promote the sustainable development of agriculture in this region, which not only can protect approximately 14.5% of groundwater resources (compared to the baseline), but also can ensure the local supply of wheaten food, vegetables and fruits."

Specific Comments:

Page 2, line 30: "has becoming. . ." should be "has become. . ."

Response: Ok.

Page 2, line 44: what is the meaning of "As s metric. . ."?

Response: Metric should be "method".

Page 3, line 60: please give the full name of "HSP", since it first appeared in the introduction of the paper.

Page 3, line 77: "are located in . . .." » "is located in . . .."

Page 4, line 80: it is better to use "from July to September"

Response: The above problems were modified.

Page 4, line 88: please check the number of weather stations in Figure 1. It seems to me that only 22-23 stations can be found. Please add the id number to the stations in Figure 1.

Response: Thanks for the reviewer's carefulness, the weather stations is 21 in figure 1.

Page 7, line 138: please move the sentence “ETc is crop actual evapotranspiration (mm)” to the front of the sentence “Pe is the effective . . ..”

Page 10, line 204: please change to “indicated that vegetables and winter wheat. . ..”

Response: We corrected line 138 and 204, thanks a lot.