Response to Anonymous Referee #2

We would like to thank referee #2 for his valuable comments on our manuscript. We used italics to mark our answers to his comments.

General comments: Paper titled "An assessment of land use change impacts on the water resources of the Mula and Mutha rivers catchment upstream of Pune, India" by Wagner et al. is reviewed. This paper addressed impact of land use change on water resources availability and temporal variability in selected Upper Bhima catchment (upstream of Pune city). Adopted methodology and modeling protocol is well defined. Authors have done good review work on the given subject and also for the study area. In my opinion the paper over all bring good set of information.

In addition some of the issues are required to be addressed:

1. Information regarding inter-basin transfer need to be included about the study area. One of the important reservoir (Mulshi) located at up-stream part of the catchment divert water outside the catchment for power generation (also known as west-ward diversion). This is not included in the paper at the moment. As paper is looking temporal and spatial variability of inflows, adding this information would add further value. How the water availability at Mulshi changed over the period and trade-offs between agriculture vs power.

Answer: The west-ward abstraction at Mulshi dam is incorporated in the model based on a constant monthly abstraction rate, which is estimated using downstream river gauge measurements (see also Wagner et al. 2011), since measured discharge data from the dams was not available. This setup is the same for both model runs so that the results of our land use impact study are not affected. We will include more information on the reservoirs in the revised manuscript in the study area description and the model setup section.

2. It would be good to show all the major reservoirs (including Ujjani) of Upper Bhima catchment in one of the figure. As authors have mentioned about Ujjani reservoir in discussion part. Water availability of the Ujjani reservoir is dependent on upstream water uses and release from different dams.

The Ujjani reservoir is outside of the domain of the study area and of Figure 1. Therefore we refrain from explicitly referencing its location. However, we will include information on Ujjani reservoir (and its location ~ 100 km downstream of Pune) in the study area description of the revised manuscript so that it is not new, when referred to in the discussion section.

3. You could also cite Garg and colleagues work for this study area describing catchment hydrology using SWAT (Spatial mapping of agricultural water productivity using the SWAT model in Upper Bhima catchment, India by Garg et al., 2012, Published in Irrigation and drainage 61(1): 60-79).

Thank you very much. The suggested study provides good reference with regard to the importance of the Mula and Mutha Rivers catchment for downstream water users and reservoirs. We will include it in the revised paper.

4. Figure 4: Changes in ET is shown in terms of Percentage. Probably it will be good to show it in terms of absolute values. Similarly Figure 5, water yield also could be converted in term of absolute amount (in mm terms).

The advantage of showing percentage changes is that these do not dependent on the sub-basin size. Thus, the percentages give a measure for a comparison of the sub-basins and hence a spatial pattern, which we intend to show in the two figures. However, we will include the corresponding absolute values for the minimum and maximum changes in ET and water yield in the revised manuscript.