Reviewer 2 (R2)

1. How do you pick the training sites? Will the vegetation type and climate type (seasonal climate) have any effect on your trained ANN algorithm? Given that Fluxnet sites at least in N. America are mostly forest sites, will that have any potential impact on your trained ANN?'

   Response: The training sites were randomly selected with a representative across latitude 0-90° North and South at 10 degree interval. The vegetation type seems to have an effect on the model prediction which is already shown in Fig (9).

2. I think a paragraph on Rs and factors affecting Rs is missing from the paper. This is necessary to justify your choice of inputs for your ANN.

   Response: Necessary discussions will be incorporated**.**

3. Please include discussion on why the method performs poorly over cropland (Figure 9)

   Response: The probable reason of the poor ET_d prediction in the croplands could be due to the effects of irrigation that is unaccounted in ET_i upscaling. Since the upscaling factor is based on the ratio of instantaneous to daily shortwave radiation, the impacts due to irrigation cannot be capture, and higher errors can be expected. We shall add this description in the revised manuscript

4. As discussed in lines 25-27, R_{sd} and cloudiness are directly related. ANN has no input related to cloudiness. However, you argue that you assess the performance of ANN under cloudy sky condition based on simple cloudiness index. Please elaborate on this and include discussion in the paper. Can you use Precipitation or the index of cloudiness as an input to your ANN?

   Response: The daily cloudiness index was estimated as the ratio between observed R_{Sd} and extraterrestrial shortwave radiation to assess the performance of the ANN under variable cloud conditions. We shall add the necessary details in the discussion.

   The use of daily precipitation and soil moisture can be an improvement in the ANN model, which needs to be tested further. We shall include an analysis using a subset of sites over which daily soil moisture and rainfall data were available (as also proposed in response to R1).

5. Since vegetation plays an important role in Evapotranspiration, it would be interesting to compare different scaling methods against the type of vegetation as well (in graphs or figures)

Response: We agree, and will add a comparison statistics of different scaling methods across different vegetation types.