[Reviewer comments in normal font; *Author replies in itialic*]

REVIEWER 1

Minor changes

There are a few minor comments remaining that should be addressed prior to publication, the most important of which is that the manuscript still requires further grammatical editing throughout. I note some grammatical edits below which apply to the abstract for example.

Line 16: Should read "the Indus basin…"

Line 17: "period" should be "periods" and "the Ganges basin"

Line 20: "which is related to the…"

Line 361 & 366: Bodyko should by Budyko

Reply: *We agree the manuscript would benefit from grammatical editing.*
Changes: *We have changed the specific grammatical errors mentioned by the reviewer. Moreover, we throuroughly edited the manuscript and corrected remaining errors to our best ability.*

Line 26 starts with "today" then uses a 2010 citation to support the claim, consider removing "today"

Changes: *Today was deleted (line 26)*

Line 312: error for reference to fig 6e

Changes: *Error messages have been fixed (319)*

Line 29: please be consistent on using "percent" vs the symbol "%". I suggest using the symbol.

Changes: *"percentage" was changed to "%" symbol (line 29).*

The new supplementary figure (Figure S1) is interesting and useful. It can benefit from some edits & additional explanation in supplementary materials:
(i) Larger y label for time series
(ii) Noting that white areas in spatial maps indicates land areas not included in the specific calibration or validation data (I think)

Can you please also include more detail regarding exactly what the time series are representing? It would be useful to start with your hypothesis about what you expected differences between modeled and

observed cases to be for irrigation and rainfed areas. Then explain how your plots are either consistent or inconsistent with that.

Is the differential of these lines (obs – mod) for irrigated cropland supposed to be net irrigation? Please explain how negative irrigation is interpreted and handled in your model. Is there a systematic bias in the rainfed case for periods when modeled ET peaks? (why?)

Changes: We have included a section describing Figure S1 and how it is used to validate the parameter transfer (lines 25-36). Figure S1 has also been edited. The comment about how to treat negative irrigation estimates has been added to the manuscript (line 243).

[Reviewer comments in normal font; *Author replies in itialic*]

REVIEWER 2

Minor changes

L46-47: suggestion to make the new sentence more clear:
Moreover, cloud cover can cause incomplete data coverage that can affect the temporal resolution of the ET-based approach. To address this limitation, we have aggregated the original data into monthly estimates in this study.

Reply: *We agree the sentence could be reformulated.*
Changes: *The sentence was changed. (lines 46-47).*

2. L108-109: To provide more context on why you made these changes to your approach, I think it is better to explain what Koch et al., 2020 did in their study in more detail. Potentially, you can bring back some of the removed sentences from the last revision.

Reply: *We agree that more information on changes between the two studies is needed.*
Changes: *More information on the Koch et al. (2020) methodology was added (lines 110-113)*

3. L134: Adding "temporal" to the magnitude at line 134 made it complicated, I think the addition of "monthly" to the definition of MAE is enough and temporal can be removed.

Changes: *The word "temporal" was deleted (line 133).*

Figure 6) I suggest adding a legend for panel E

Reply: *Because panel E is supplementary to the actual irrigation results, we think that adding a legend would drag attention from the results.*
Changes: *We added further information in the caption to emphasize that the panel E data legend can be viewed in Figure 1 (line 786).*

Figure 7) You can add a border around the Indus & Ganges basin inset to make the gray area more visible

Reply: *We agree that the small maps could be more visible.*
Changes: *We added a darker shade to the other climate zones, making it easier for the reader to see the figure and navigate within the irrigated area (figure 7 was changed).*