

Anonymous Referee #4

General comments:

If possible, mention the amount of water saved (that is, the difference of water consumption between the GCRPS and conventional paddy system). Since the values of complete GHGs exchange and crop production are quantitatively estimated in the manuscript, the information on water exchange is needed to state the biogeochemical cycle within the GCRPS more accurately.

Thanks a lot for the suggestion. But we are sorry for that as our water-monitoring devices could not work well during the measurement period, we did not exactly calculate the difference in water consumption between the GCRPS and conventional paddy system in this study. We will improve the investigation on this aspect in our further field work.

Specific comments:

P. 8930, L. 2 - 8 and P. 8944, L. 4 - 7: Even for each specific gas (CO₂, CH₄ or N₂O) and/or limited period (e.g., only a growing-season), is there no study of the GHG flux at rice fields using the GCRPS? (I agree that the comprehensive GHGs flux and annually based study are not available). If there are one or more articles, please cite them in the introduction and compare the results in the discussion.

To our knowledge, a few studies have conducted short-term (only in rice-growing season) measurements of CH₄ and N₂O fluxes under GCRPS (Dittert et al., 2002; Xu et al., 2004; Kreye et al., 2007). We will add this information in the Introduction and Discussion in terms of the suggestions.

P. 8936, L. 25-26: Mention the number of days for the midseason aeration and final drainage.

Yes, in this study the midseason drainage started on 25 June and ended on 30 June, and the period of final drainage was from 11 August to the end of rice-growing season.

P. 8937, L. 3-5 and Figure 1(d): During the midseason aeration (around June 30), why did the soil Eh in the GCRPS also increase? I recognize that the midseason aeration was applied only for the conventional paddy (c.f., P. 8931, L. 23 - 26).

Sorry for our undistinguished description for the water management in the GCRPS and conventional paddy. Actually, when the midseason and final drainages were practiced in the conventional paddy, also no irrigation was applied in the GCRPS during these periods.

P. 8942, L. 14 - 18 (and Figure 1(d)): So far as I know, midseason drainage lasting 7-10 days is a common length and practice in east Asia. Is the duration of midseason drainage in this study similar to those days, or the cited articles? Because the seasonal pattern of CH₄ emission is different from the common pattern, this information would be of some help in understanding.

Thanks! It is true that for the conventional paddy of East Asia, midseason drainage lasting 7-10 days is a common practice. Similarly, midseason drainage in our study was practiced during the period from 25 June to 30 June (i.e.,

approximately 6 days).

Technical corrections:

P. 8927, L. 23: Should "FAO, 2011" be listed in the References?

Yes, we will add the information about “FAO, 2011” in the References.

P. 8933, L. 13: Is it better to change "6 h" to "6 hours"?

Yes, we will change it.

P. 8941, L. 19: Does "The chick ..." mean "The chicken ..."?

Thanks! We will change “chick” to “chicken”.