

Interactive comment on “Effects of mountain agriculture on nutrient cycling at upstream watersheds” by T.-C. Lin et al.

Anonymous Referee #1

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Overall comments, Although the impact of agriculture on river water quality has been well studied around world, the case study in a subtropical tea plantation is still limited at this point. I recognize, therefore, this manuscript provided valuable information on N input-output for mitigation of anthropogenic N loss to river system from the watershed covered by tea plantation. However, I found some inadequate discussions and structures to be revised as mentioned below.

Major comments

Comment 1. Impact of agriculture on rainfall chemistry Although rain water chemistry indicated some significant or marginal differences of concentrations and fluxes between A1 and F2, it would be still doubtful that this differences are certainly caused by

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fertilizer from the surrounding agricultural area. When the spatial variability of rainfall chemistry in a landscape scale is taken accounted, the simple analysis of the difference in Figure 3 is not enough to confirm your discussion. Regarding with the ion flux in rainwater, you should also discuss the difference of rainwater amount between two sites (A1>F2, described in Line 27 of Page 4793). I would sat that you need more site replication of rainfall observation and further evidences to discuss the impact of agriculture on rain water chemistry onsite. I recommend deleting the all discussion on the impact of agriculture on rainwater from the manuscripts.

Comment 2. Data presentation and method description The budget analysis is very important for your discussion (Figure 5). The text of the methods and assumption for Figure 5 (from page 4797 line 24 to page 4798 line 19) should be described in the methods section, “2 Material and methods”. The information of fertilizer application (page 4798 line 8) should be described in the “2.1 Study site”. Furthermore, data explanation of the input and output budget in Figure 5 should be described in the result section, “3 Results”.

Comment 3. Tea plantation Although tea plantation is one of the dominant agriculture activities around the study site, this is not a representative of all agriculture as a whole. The uniqueness of this study would be “tea plantation” as an agricultural land use with much fertilizer than other crop. Therefore, I recommend revising the manuscript title from “mountain agriculture” to “mountain tea plantation” to inform this case study correctly. Also, abstract, discussion and conclusion need to convert “agriculture” to “tea plantation”.

Editorial comments

Comment 4. Figure 2 and 3; Please indicate the meaning of “X100” or “X10” in the caption correctly.

Comment 5. Figure 3; Table presentation would be much valuable for these data with the water flux data rather than figure.

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Comment 6. Figure 5; Explain which figures are N and P in the caption. In the figure, difference of N output was 101 (=106 – 5.6) between two sites, while the manuscript indicate 90 (page 4796 line 17). Which is correct?

Comment 7. You often use “topology” in the text. It might be “topography”.

Comment 8. I couldn't understand the meaning of “should A1 has 100% agriculture lands” (page 4796 line 20). Reword it.

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