

## ***Interactive comment on* “Transport and retention of phosphorus in surface water in an urban slum area” by P. M. Nyenje et al.**

### **Anonymous Referee #2**

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This manuscript presents an interesting case study about P transport in the channels of a slum area in Kampala, Uganda. The authors made a great effort working in a challenging area where data are scarce and research presents difficulties for monitoring and sampling. These types of studies contribute to the development of the society with some clear applied objectives and they have to be reflected in the scientific literature. Nevertheless in spite of the good methodological description and the suitability of the techniques applied, this work presents some weak points that make difficult to publish it in this journal. Anyway I think it would be totally suitable for publication as a case study in other scientific publication. 1. The authors highlighted that “. . . studies on P transport in streams and/or channels draining unsewered informal settlements (or slums), where most P discharge are associated with untreated or poorly treated domestic wastewater

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discharge from on-site sanitation, have not been published” but they don’t present what are going to be the challenges or scientific interest of this study compared with others when there is a different source of P. Also they referred in the discussion to published studies in this topic of Chua et al. (2009) and Katukiza et al. (2012). If they want to show the novelty of this study they must do a much better search and discussion of previous works.

2. The main problem of this work is that (a) if they want to present a new perspective concerning P transport in the slum areas they must include a more complete dataset that ensure that this study is not merely a local situation non-exportable to other similar environments. (b) If the objective is to present a case study with international impact the analysis and results are not enough outstanding and rigorous to be published in its present form. (a) The data are not representative because of the limitation in space and time of the monitoring activity. Only two high flow events were sampled, probably incomplete as the authors explained (maybe they didn’t sampled with enough density during the peak), the maximum monitoring time extends for 3-5 months and only in two channels (that was not discussed why they were selected). The period of monitoring is short and therefore, would throw partial results. With this limited dataset, it seems difficult to extrapolate these conclusions to another region or even in the study area it would be not sure that the other channels in Kampala can show a similar pattern. (b) The analysis of the results and some of the assumptions that the authors made are not rigorous for a manuscript that pretend to present a new perspective in the study of P in urban areas. It is based on too many uncertain facts not quantified and that can be applied or not depending if the results need them or not to match. Some examples are: The arbitrary definition of old and recent. The concept of shallow-deep sediments was not accompanied by any study of this and it lacks of geological meaning. The authors proposed that 0-30 cm means that sediments area recent and deeper than 30 cm are old, in areas with storm events, 60 cm of sediments can be easily deposit in one single event. The explanations concerning why first flush effect are not detected. This could be one of the main findings of this study but the interpretation is based on

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personal observations and a topographical explanation that is not demonstrated with quantitative data (for example with a DEM construction and flow accumulation study). The discharge of the pit latrine content is an original idea but is not accompanied by any quantification of the effect to check if it has the potential to change the chemistry and the P content. Some of the observations that the authors made about the results are not evident for me when I check the figures. Figures 3 and 4 presents many different peaks, some of them are considered interesting and therefore analyzed, but others are simply ignored. In page 10292, lines 9-11 it is stated that "...deeper sediments contained less Ca-bound P than shallow sediment whereas Fe-bound P was approximately equal in both deep and shallow sediments (Figs. 5 and 7)". In figure 5 I don't see actually the differences that are commented, B1 shallow and deep are almost identical and the difference with B2 is barely representative to be commented as evident.

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