

Interactive comment on “Socio-hydrology: conceptualising human-flood interactions” by G. Di Baldassarre et al.

Anonymous Referee #3

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General comments: The interaction of society and hydrology presents itself in many ways. This manuscript is focusing on the human-flood interaction, which plays an important role in human history. The work analyzes thoroughly the underlying principles which drive the evolution of floodplain. Various players of natural hydrology, technology, policy, economy, and especially psychology are integrated in a set of fully coupled differential equations. The proposed model is conceptually complete and the numerical experiments show its applicability. The language is well written. I recommend its publication on HESS. Specific comments: 1) The parameter $\lambda_{\text{mada_E}}$ in Eqn 4(a) could be a variable relating to the technique level (also the economy). The parameter could increase with the progress of technology (and economy). I am not sure if this influence is significant. Please check it. 2) In the hypothetical examples, the values of

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model parameters are arbitrarily given according to its physical meaning. Actually, the parameter values could vary greatly for different real world cases. I am wondering if the evolution pattern could be completely changed when you alter the parameters. Are there any possibility of producing the nontrivial dynamic behaviors through the mathematical analysis like the nonsmooth dynamic behaviors found in an ecohydrological model (Lin et al., 2013)? I am not meant for the authors to do that in this paper. It could be a future work. 3) Ln27, Page4525: the higher growth rate or the lower? Please check it. 4) In figure 3, should the legend in b) be in e)? please check it.

Reference: 1. Mu Lin, et al.. Non-trivial dynamic behaviors inherited from an ecohydrological model: mutation, bifurcation and chaos. *Mathematical Problems in Engineering*, Volume 2013, Article ID 731042.

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