

Interactive comment on “Hess Opinions: Socio-economic and ecological trade-offs of flood management – benefits of a transdisciplinary approach” by Karl Auerswald et al.

Anonymous Referee #2

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This is a timely paper that provides excellent insight into the complexities of floodplain use, flood management, the unintended consequences of engineering solutions to flood protection and management. In this regard, the overview of socio-economic and, ecological consequences within and beyond the river provided in Figure 1 was particularly useful. The examples used in the paper also provided good insights, and although these are derived from Europe and North America, they are of global relevance (e.g., the importance of side arms and channels within a floodplain as refugia for aquatic biota in the case of catastrophic events, pg 9).

It is, however, important to note that the impacts of human alteration of river and flood-

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plain form and functioning is not unique to the northern hemisphere, from where most of the examples are derived. In many developing and emerging economies in the Global south, populations are concentrated in floodplain areas as these provide important livelihoods opportunities. This increases their vulnerability and “killer floods,” mostly affect developing countries (Kundzewics et al. 2013). As economies develop, and the capability for implementing improved flood mitigation improves, the insights and recommendations from Auerswald et al. are relevant not only for conceptualizing proactive mitigation strategies, but also for developing appropriate policy interventions. If they wish, the authors might want to draw on some of the “management rather than control” (pg 11) approaches that are applied in regions where the construction of infrastructure (e.g., levees) is less well established (see Brackenridge et al., 2017). This is especially important for emerging economies where human habitation and associated pressures on floodplain ecosystems are likely to drive investment in quick fix, technological solutions.

Brackenridge et al., 2017. Design with nature: Causation and avoidance of catastrophic flooding, Myanmar, *Earth-Science Reviews* 165: 81-109, <https://doi.org/10.1016/j.earscirev.2016.12.009>.

Kundzewicz, Z.W., et al., 2013. Flood risk and climate change: global and regional perspectives. *Hydrological Sciences Journal*, 59 (1), 1–28.

Minor text edit suggestions.

Pg 9, 10, Revise end of sentence: On the other hand, if contamination of the river system occurs as in the deadly chemical spill of the River Rhine in 1986 during a fire at a Sandoz warehouse, side arms and channels within a floodplain can act as important refugia for aquatic biota and facilitate faster subsequent recolonization

Pg 9, 24, red deer is a specific example – I am not sure if a species name is required here,

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