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Hydrology and Earth System Sciences Discussions

Interactive comment on "Raising the dead without a Red Sea-Dead Sea canal? Hydro-economics and governance" *by* D. E. Rosenberg

Anonymous Referee #2

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The research is well thought out, and provides a valuable contribution to the literature, particularly when taken in tandem with the efforts of the World Bank. However, with the detailed analysis of the flows in the model and the constraints that are posited (1-7) there seems to be a dearth of discussion of the results of the hydro-economic model. This portion is relegated to four short paragraphs, quickly summarizing the results of four figures and multiple models/configurations. You walk us through the expected outcomes, but this portion of the analysis deserves more discussion. Specifically, a discussion of the elements in the hydro-econ models that generate the large variation that we see when flows to the Dead Sea increase above 700 MCM/year. There is a great deal of information provided in Figure 3, but it seems to warrant only a single paragraph of discussion in your analysis.

Specific comments:

One of my fears with the hydro-economic model concept is that it has an overarching objective of maximizing system-wide benefits. This works well when the political or managerial power is centralized, but in the case of an international accord, I fear that a single maximized objective will face unobserved transactions costs or market failure. It will likely be the case that each individual agent acts to maximize their own individual outcome, which may not represent the goals of the whole. For example, you reference a combined $US 658 M/year benchmark WTP. It would be worthwhile to address in the paper how the individual WTP measures compare to the individual expected benefits (as opposed to the net measures). This is addressed briefly in paragraph two on page 9675, but deserves more discussion.

The introduction of brine water, reused waste water [grey water] and agricultural returns, which may have nutrient or pesticide contamination, introduces environmental concerns. Although these are not included in the model, some discussion other than "even with small remediation costs" should be included. Many of the configurations that the hydro-economic model uses include brine, waste, return, etc. water sources; if you are going to address the fact that inclusion of these costs would make the Red-Dead project less desirable, you should address how they influence the hydro-econ configurations.

Jordan's Unity Dam on the Yarmouk River: this is included in the model as a maximized 146 MCM/year contribution, but you note that "the dam has yet to fill and has stored only a paltry 7 to 30 MCM/year" – these two statements seem to contradict one another, and seem to introduce a flow that has no basis in reality.

Errors in the manuscript:

pg 9665, line 9: "Where possible, [I] quantify environmental demand. . ."

pg9665, line 18/19: either "where the constraint[s were] relaxed [by] one unit", or

“where the constraint [was] relaxed [by] one unit” will improve this statement.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 7, 9661, 2010.