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Hydrology and Earth System Sciences Discussions

Interactive comment on "Combined assessment and regulation on ecological land use and water demand of the river system: a case study in Luanhe River, North China" *by* D. H. Yan et al.

Anonymous Referee #1

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General comments: This manuscript presents a framework of the land and water management in a river basin in term of ecology, and the Luan River basin was selected for the case study. The Luanhe River basin was classified into four types of ecological functions, i.e., ecological preservation areas, habitat restoration areas, ecological buffer areas and development and utilization areas. And the water resources in this basin were allocated for the four areas. The basic concepts are reasonable in general, however, some terminologies are difficult to be understood. And the methodology defined in this manuscript is poor to be understood.

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Discussion Paper

Specific comments: (1) For the whole manuscript, definitions of the eco-environmental functional areas were ambiguous. It needs clear definitions in the manuscript, and the related literatures are required to support the definitions. (2) Page 9231, Line 19: definition of "the ecological water use of the river" is needed. (3) Page 9233, Line 25: What does "changes obviously from 2250âĎČ to 4000âĎČ" mean? (4) Page 9236, the section 3.1.2: What the "Crucial eco-environmental functional areas" mean? Is there any literatures for this concept? (5) Page 9239: please make sure that all variables used in the equations are clearly defined. (6) Page 9240, lines 21-25: "The water demands of evaporation consumption in every vegetation unit are 500mm for forest land, 330mm for bush, 330mm for open forest land, 350mm for other forest lands, 300mm for grassland with high coverage, 210mm for grassland with medium coverage, and 150mm for grassland with low coverage." Where do the values of water demands come from? (7) Page 9241-9244, Section 3.2.4: What is the principle of the eco-environmental functional regionalization? Is there any literature for supporting this classification? It may meaningless to list the concepts of functional land uses only. (8) Page 9244-9248, Section 3.2.5: How to link the previous section (Section 3.2.4) with this section? Are there any quantitative methods? And, methods for assessment and planning should be different, why you put them into the same sections? (9) Page 9248, lines 11-15: Please add the literatures for the suitable flow velocity. (10) Page 9248, lines 18-20: Please add the literatures for the suitable water depth. (11) Figures 1, 3, 4, and 5 have not been mentioned in the paper. Why did you put into this manuscript? (12) Table 2: There are no data in the development and utilization areas, why did you put this category in the table? (13) Table 3: How did you obtain the values of different land uses shown in this tale? (14) Figure 1, 2 and 3 should be combined. (15) Figure 4: What are the differences between natural preservation area and water source preservation area? Can on distinguish these two areas in an actual case? The sub-categories of the development and utilization area are confusion, e.g. drinking water sources area. (16) Figure 5: What does the suitability index mean? And how to estimate the value? (17) Figure 7 and 8: Areas should be illustrated by polygons rather

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than by lines. (18) In a land use planning, the ecological land suitable for development should be located outside of the river. The meaning of this figure is confusion. (19) Figure 10 and 11, what is the data source of the annual runoff?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 9229, 2011.