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Hydrology and Earth System Sciences Discussions

Interactive comment on "Potential impacts to freshwater ecosystems caused by flow regime alteration under changing climate conditions in Taiwan" *by* J.-P. Suen

X. Chen

xichen@hhu.edu.cn

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General comment: The article presents an assessment of climate-induced flow regime changes (1961-1990) affecting freshwater ecosystem using IHA approach, and the studied issue is interesting out of question. However, it is essential to address weather the flow regime alteration is resulted from climate change or human activities (i.e. impoundments, water-diversion engineering, soil and water conservation measures etc). Many studies demonstrate that impacts of these human interferences are more significant than climate change (e.g. Richter et al. 1996, 1997, 1998; Shiau et al. 2004; Yang

et al. 2008, Chen et al. 2008). In particular, Shiau et al. (2004) applied the IHA and Range of Variability Approach (RVA) to investigate the hydrologic alterations before and after the construction of diversion weir on Chou-Shui Creek, Taiwan, suggesting that the natural flow restoring is affecting the natural stream biota. This result indicates that impacts of human interferences on hydrologic alterations are significant in Taiwan. Therefore, what on earth are the primary driving forces to flow regime alterations and freshwater ecosystem in Taiwan? Is the climate change a solely contributor to flow regime alterations and freshwater ecosystem? I can not agree with the conclusion in the article without any discussion on the impacts of major human activities. The author needs to examine the range and intensity of a variety of human activities I mentioned above, or precipitation and temperature changes which may be used as background of climate change in Taiwan. I understand it is difficult to separate the impacts of climate change and human activities on flow discharges, but the article is requested to conduct this investigation before accepted for publication.

Overall recommendation: Major revision.

Specific suggestions: 1.Stream-networks in Taiwan should be added in Fig.1 to make readers easily understand what happened in these streams or wetlands in this article. 2.The author should refer to some relevant literatures conducted in Taiwan. For instance, Shiau et al. (2004) applied IHA and RVA to investigate the hydrologic alterations before and after the construction of diversion weir on Chou-Shui Creek, Taiwan.

Shiau JT, Wu FC. 2004. Assessment of hydrologic alterations caused by Chi-Chi diversion weir in Chou-Shui Creek, Taiwan: opportunities for restoring natural flow conditions. Regulated Rivers: Research and Management 20: 401–412. Yang T., Q. Zhang, Y.D. Chen, X. Tao, X. Chen, 2008a. A spatial assessment of hydrologic alternation caused by dam construction in the middle and lower Yellow River, China, Hydrological Processes, 22, 3829–3843 . Chen Y.D., T. Yang, C.Y. Xu, Q. Zhang, Xi Chen, 2008b. Evaluating hydrologic alternation along the Dongjiang (East River) basin, south China: A visual enhanced RVA approach, Stochas-

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Interactive Comment

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