

Earth Syst. Dynam. Discuss., referee comment RC2  
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## Reply on RC1

Anonymous Referee #2

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Referee comment on "Coupling human and natural systems for sustainability: experience from China's Loess Plateau" by Bojie Fu et al., Earth Syst. Dynam. Discuss.,  
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Through a thorough review of current research on coupled human and natural system (CHANS), the manuscript proposes a conceptual cascade framework of "Pattern-Process-Service Sustainability" and systematically demonstrates its applications in China's Loess Plateau (LP) in terms of coupling landscape patterns and ecological processes, linking ecological processes to services, and promoting social-ecological sustainability. By identifying the current research limitations, it points out the need for "the integrated research on multiple processes, the cascades of ecosystem structure, function, services, and human-wellbeing, the feedback mechanisms of human and natural systems, and the data and models for sustainability", especially implementing basin-wide management to consider not only the local ecohydrological effects caused by vegetation restoration, but also its effects on distant regions through telecoupling processes. The manuscript is well-written and innovative. It provides a much needed CHANS framework to address the bottleneck challenges facing both research and policy communities. The manuscript is of interest not only to the readers of the journal but also the wider ecological, socioeconomic, humanity, and management communities. I only have the following minor suggestions for the authors to consider:

- 1a shows the human system and natural system affects sustainability in one singular direction, while Fig.3 depicts sustainability impacts the interactions of both human and natural systems. Thus, Fig.1a should be modified to be consistent with Fig.3.
- 3 depicts both trade-offs and synergy but appears emphasizes trade-offs and synergy only occurs between ecosystem services. Would defining, implementing/achieving sustainability by human activity also lead to synergy between enhancing the capacity of natural system and the well-being of human being across multiple scales as well?
- Based on the research experiences in the LP, the manuscript suggests future scientists and policy-makers "apply a basin-wide and telecoupling perspective to formulate land

use policies, and carry out ecological restoration more effectively in the future.” This key and also challenging recommendation applies not only to China’s LP but also to the rest of the world. I wonder if the authors can elaborate a little further on how to implement this suggestion from an institutional perspective.

After these minor revisions, I recommend the manuscript be accepted for publication.