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We argue that science concerned with natural resource policy analysis is entering a new phase. In response to policy demands for triple-bottom-line assessments, developing transdisciplinary endeavours has been a primary focus, catalysing methodological innovations. However, the period of innovation has increased the divergence between a science domain characterised by increasing complexity of communicated analytical outputs and a policy domain that generally remains impelled towards single metric outcomes. We argue that this new phase will see the focus shift from method innovation towards the design of research processes to correct the discrepancy. This paper describes the Challenge and Reconstruct Learning framework (ChaRL) for designing sustainability-focused research processes to better align science contributions and policy aspirations in complex decision making arenas. This paper provides evidence for how the ChaRL framework can (1) establish and maintain an effective science-policy interface despite high levels of complexity and high levels of contested values, and (2) challenge and reconstruct existing knowledge, providing a robust foundation to evidence-based decision making. Critical for these achievements is that the design of the engagement process starts with the cognitive elements critical to the decision making processes, that is individuals' causal beliefs and values.

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