

Appendix 3. Additional information on methods.

Box A3.1: Author's contribution to this study

- Definition of indicators, preparation of survey (JR, in consultation with SL)
- Scenario assessments
 - OZW (JR, SL, MA, MLM)
 - RWR (JR, SL, CK, MM)
 - IND (SL, MD, SF)
 - UTH (JR, SL, CD, TP)
- Analysis of implementation of indicators in case studies (JR, SL)
- Survey on scenario assessments (MA, MD, CD, CK, MM)
- Overall evaluation of the usefulness of scenario assessments (JR, in consultation with SL)
- Critical review of manuscript (all)

Table A3.1: Operationalization of the nine research challenges identified by Swart et al. (2004) with survey questions related to the four criteria of research efficiency.

Research challenges of sustainability science (Swart et al. 2004)	Criteria of research efficiency (and survey questions) that link to the research challenges (the survey can be found in Tab. A2.2)
1. Combining qualitative and quantitative analysis	Credibility (q. 1 to 5)
2. Engaging stakeholder	Legitimacy (q.1 to 5), Salience (q. 4)
3. Reflecting multiple stresses and functional complexity	Capacity building (q. 2,3,5)
4. Integrating across themes and issues	Capacity building (q. 2, 3)
5. Accounting for volition	Capacity building (q. 8, 11-13)
6. Recognising a wide range of outlooks	Capacity building (q. 9, 10)
7. Spanning spatial scales	Capacity building (q. 6)
8. Accounting for temporal inertia and urgency	Capacity building (q. 7)
9. Reflecting uncertainty, incorporating surprise, critical thresholds, and abrupt change	Capacity building (q. 4, 5, 14)