Letter

Co-production for fundamental change: a response to Sutherland et al.

Sutherland et al. (2017) suggested that in most cases co-assessment of existing knowledge is preferable to co-producing knowledge, because the former is more cost-effective. They presented a model for using knowledge for solving problems, in which global collation of scientific knowledge is followed by co-assessment of global and local knowledge by researchers and the local community. Only in globally relevant cases is knowledge co-produced. I agree, of course, that it is irrational to ignore existing knowledge. But their suggestion does not do justice to the range of benefits of co-production, reflects a natural-science centred way of using science to improve conservation practice and, in addition, cost-effectiveness may not be the relevant criterion for assessing the value of co-production.

The recognized benefits of knowledge co-production include three logics: scientific accountability to the public, inclusion of the knowledge, perspectives and experiences of extra-scientific actors, and implementation of scientific knowledge (van der Hel, 2016). The first two reflect democratic values and cannot be expressed in monetary terms. The third highlights the fact that relevant actors can make a difference in society. Depending on the purpose, local communities are certainly not irrelevant. Firstly, members of local communities can simultaneously work in several roles. Secondly, they may hold knowledge of a local nature or on social issues, which assessment of existing knowledge would not necessarily identify (e.g. assessing alternative conservation prioritization analyses could be combined with field visits to co-produce understanding of ecologically important areas and to allow negotiation between actors; Paloniemi et al., 2018). Thirdly, in the case of voluntary conservation, collaboration with local actors is an integral part of improving conservation efforts (Salomaa et al., 2016).

The model of Sutherland et al., seems to relate to the evidence-based approach of compiling and assessing natural science centred knowledge. Promoting only statistically generalizable knowledge as desirable sidelines the value of the social sciences. Their contributions can be descriptive, diagnostic (e.g. explaining why actions have succeeded or failed), disruptive (e.g. revealing inequities), reflexive or innovative (Bennett et al., 2017). Social sciences can also offer conceptual generalization from local cases. In addition to integration of the knowledge of different actors, the concept of co-production has been used to describe the fact that science, governance and social norms interact (Jasanoff, 2004). Adams & Sandbrook (2013) have suggested that evidence should include qualitative data and local knowledge, and that complex policy processes should be addressed more thoroughly. The evidence-based approach is perhaps not yet sufficiently developed to include the contributions of the social sciences. Co-assessment therefore highlights the dominance of the natural sciences.

In summary, determining whether co-assessment or co-production is more cost-effective requires assessing practical conservation improvement in long-term transdisciplinary studies that consider both the local and broader socio-ecological contexts. I suggest that co-production should not be limited to cases where it contributes in a cost-efficient manner to the global pool of natural science data, because co-production is a key element in societal transformation.

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References

Adams, W.M. & Sandbrook, C. (2013) Conservation, evidence and policy. *Oryx*, 47, 329–335.

Bennett, N.J., Roth, R., Klain, S.C., Chan, K., Christie, P., Clark, D.A. et al. (2017) Conservation social science: understanding and integrating human dimensions to improve conservation. *Biological Conservation*, 5, 93–108.

Jasanoff, S. (2004) *States of knowledge: The Co-production of Science and the Social Order*. Routledge, London, UK.

Paloniemi, R., Hujala, T., Rantala, S., Harlio, A., Salomaa, A., Primmer, E. et al. (2018) Integrating social and ecological knowledge for targeting voluntary biodiversity conservation. *Conservation Letters*, 11, e12340.

Salomaa, A., Paloniemi, R., Hujala, T., Rantala, S., Arponen, A. & Niemelä, J. (2016) The use of knowledge in evidence-informed voluntary conservation of Finnish forests. *Forest Policy and Economics*, 73, 90–98.

Sutherland, W.J., Shackelford, G. & Rose, D.C. (2017) Collaborating with communities: co-production or co-assessment? *Oryx*, 51, 569–570.

van der Hel, S. (2016) New science for global sustainability? The institutionalisation of knowledge co-production in Future Earth. *Environmental Science and Policy*, 61, 165–175.