Summer 8-2019

Forging future organizational leaders for sustainability science

David Hart

Forging future organizational leaders for sustainability science

Leaders of sustainability research organizations need to provide an environment where interdisciplinary and transdisciplinary science flourish. Developing the necessary leadership skills and attributes requires new, targeted training programmes.

I. J. Gordon [1,2,3*], K. Bawa [4,5], G. Bammer[6], C. Boone[7], J. Dunne[8], D. Hart[9], J. Hellmann[10], A. Miller[11], M. New[12], J. Ometto[13], S. Pickett[14], G. Wendorf[15], A. Agrawal[16], P. Bertsch[17], C. D. Campbell[3], P. Dodd[18], A. Janetos[19], H. Mallee[20] and K. Taylor[21]

[1]Division of Tropical Environments and Societies, James Cook University, Townsville, Queensland, Australia.

[2]The Fenner School of Environment and Society, The Australian National University, Canberra, Australian Capital Territory, Australia.

[3]The James Hutton Institute, Dundee, UK.

[4]AshokaTrust for Research in Ecology and the Environment, Bangalore, India.

[5]University of Massachusetts, Boston, MA, USA.

[6]Integration and Implementation Sciences, The Australian National University, Canberra, Australian Capital Territory, Australia.

[7]School of Sustainability, Arizona State University, Tempe, AZ, USA.

[8]Santa Fe Institute, Santa Fe, NM, USA.

[9]Senator George J. Mitchell Center for Sustainability Solutions, University of Maine, Orono, ME, USA.

[10]Institute on the Environment, University of Minnesota, Saint Paul, MN, USA.

[11]The Earth Institute, Columbia University, New York, NY, USA.

[12]African Climate and Development Initiative, University of Cape Town, Cape Town, South Africa.

[13]Earth System Science Centre (CCST-INPE)/Rede- Clima, São José dos Campos, Brazil.

[14]Cary Institute of Ecosystem Studies, Millbrook, NY, USA.

[15]Center for Technology and Society, Technische Universität Berlin, Berlin, Germany.

[16]International Forestry Resources and Institutions, University of Michigan, Ann Arbor, MI, USA.

[17]CSIRO Land and Water, Acton, Australian Capital Territory, Australia.

[18]Office of Research, Interdisciplinary Research and Strategic Initiatives, University of California, Davis, Davis, CA, USA.

[19]Frederick S. Pardee Center for the Study of the Longer-Range Future, Boston University, Boston, MA, USA.

[20]Research Institute for Humanity and Nature, Kyoto, Japan.

[21]Our Land and Water National Science Challenge, Christchurch, New Zealand.

*e-mail: iain.gordon@jcu.edu.au

The development of sustainability science, based on interdisciplinary and transdisciplinary research skills, is a focus of discussion in academia[1]. Institutional leadership for sustainability is also becoming a critical component of mainstream course offerings inside and outside universities[2,3]. However, these courses tend to focus on practitioners from industry, government and non- governmental organizations. In contrast, building the next generation of academic leaders has received little attention[4], and even less attention has gone to developing leaders of interdisciplinary and transdisciplinary organizations that deliver education and research for sustainability. Such organizations include schools, institutes and centres within universities (for example, The Earth Institute, Columbia University, USA; African Climate and Development Initiative, University of Cape Town, South Africa; University of Cambridge Institute of Sustainability Leadership, UK), governmental and private research organizations (for example, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia; The James Hutton Institute, UK; Research Institute for Humanity and Nature, Japan), cross-institutional research networks (for example, RedeClima, Brazil) and research- focused non-governmental organizations (for example, Ashoka Trust for Research in Ecology and the Environment, India). The urgency of sustainability challenges makes it imperative to pay special attention to developing the necessary skills, experience and aptitudes of future organizational leaders within these institutions, so that they are able to provide an environment where interdisciplinary and transdisciplinary science flourish.

In March 2018, a group of 20 leaders, from a range of sustainability science and related institutions, met to discuss our experiences of organizational leadership[5], especially the challenges we faced and the successes and failures we experienced. Our learning continued at

subsequent meetings, including a recent Oceania regional meeting (http://nitro-oceania.net). Here we describe our collective views on the defining features of leadership of sustainability research organizations, call for specific endeavours to develop the future leaders of such organizations, and propose concrete steps for academia, governments and funders to foster such leadership.

Leadership knowledge and skills

We have distilled a set of knowledge, skills and attributes that are necessary for leaders of sustainability research organizations. The aim is to help leaders understand that they are not alone in their challenges, can learn from the successes and mistakes of others, and can join the call for resources to develop future leaders. Our focus has been on the defining characteristics that are transferable beyond their original context, and that will develop and mature, over the entire life experience of the leader.

Although leadership theory in business is well established (searching for books about 'business leadership' on Amazon generates over 50,000 results), academic and other research organizations, especially those focused on sustainability, are not businesses and, therefore, require different sets of knowledge, skills and attributes for their leaders[6,7].

Here we intend to complement and provide a specific focus for the generic executive leadership skills taught by business schools (for example, Harvard[8], Yale[9] and London School of Economics[10]) and science communication training from professional organizations focused on sustainability[11]. In our experience, effective leaders of organizations addressing sustainability

challenges set cultural norms and guide their faculty, staff and students in the following seven areas. Leaders may not do all of these things themselves but must find ways to put each of them in place.

Envision beyond the status quo. Sustainability science requires thinking beyond the boundaries of traditional academic and other research organizations, and the current reality. This visioning, however, must be coupled with a realistic assessment of what the organization and its organizational partners can contribute. The leader will have to continually reflect on, and adapt to, the changing needs of stakeholders, and the opportunities to develop alternative sustainability capacities and pathways.

Nurture partnerships and interactions effectively. Building a comprehensive knowledge base about sustainability issues and providing the best possible advice on ways forward both need partnerships and interactions, using a 'spider web' rather than 'tree' model of knowledge[12]. To these ends, engagement involves multiple individuals, groups and institutions across government, business and civil society[13,14], which in turn requires the ability to take into account multiple policies, practices, governance structures, forms of knowledge, perspectives and interests, among others. Different forms of engagement may be suitable for different partners at different times, ranging from informing, consulting, involving and collaborating to empowering[15]. It is also critical to minimize the time, money and energy required to develop and maintain partnerships, so that interactions are efficient as well as effective. Leaders need to exploit diverse, tailored communication processes both within the organization and with diverse partners and audiences outside.

Harmonize values and empirical rigour. A leader needs a sense of purpose, a logic model and theory of change for guiding their strategy, and a worldview that is informed by both science and values. This approach must be harmonized with critical assessment of the social, economic, cultural and biophysical realities and requires searching for disconfirming as well as supportive evidence, exploring counterfactuals, attempting to eliminate bias and other hallmarks of academic rigour to reach a thoughtful and transparent normative judgement. It is also critical to avoid 'paralysis by analysis' and to be able to provide the best possible timely advice to decision-makers and other partners.

Promote respect for multiple ways of knowing. Drawing on diverse forms of knowledge and know-how increases the likelihood that sustainability science can deliver solutions that address real-world challenges. This is relevant to interactions inside the organization, as well as those outside. Leadership is often required to overcome ignorance of or hostility towards other ways of knowing, including disciplines with different epistemologies, Indigenous and local knowledge, normative discourse and practice-based knowledge.

Foster equity, shared leadership and consensus. Both sustainability and inter- and transdisciplinarity place considerable weight on equity issues, and their consequences for power structures, political economy and ecosystems, within and outside the organization. This leads to greater demands for transparent structures and shared leadership (sensu ref.[16]) within the organization, to engage diverse disciplines and points of view, and ensure decision-making by consensus. However, balancing these internal desiderata against the practicalities of working in

what may be fraught social, environmental and political environments requires a special combination of traits, including pragmatism, humility and wisdom.

Cultivate nimbleness and flexibility. All research takes time to do well, and even more so when it requires stakeholder involvement and co-production, along with the integration of multiple ways of knowing. Often, research timelines do not fit easily with the urgency of decision-making for policy and practice change. Sustainability research organization leaders need to find a balance between the requirements for conducting high-quality research, the need to respond promptly to real-world demands for research input and the responsibilities of organizational management. Such a balancing act requires nimbleness and flexibility, which are still poorly understood and practiced in the research world. Leaders need to be able to assess what is required and possible, to create incentives for rapid project prototyping and delivery, and to be committed to 'learning while doing'.

Persevere and be resilient in the face of substantial pressures. Dealing with sustainability issues often involves challenging established power structures, ways of operating and vested interests both within and outside sustainability research organizations. Those resisting change may use misinformation and smear tactics in attempts to discredit research, researchers and research organizations. Legitimate research debates can also become fraught and politicized. Pressures can also be more prosaic, for example, refusal by universities to make even small adaptations to promotion and tenure requirements to accommodate these new ways of operating. Even advantageous developments — for example, opportunities to expand programmes — can be

highly stressful when they outstrip ability to hire suitable staff and build effective teams. Perseverance and resilience are essential to dealing with all these pressures.

The next generation of leaders

We offer four suggestions to train the leaders of the sustainability research organizations of the future.

First, we need new courses, pedagogies and modes of delivery that focus on leadership training and professional development. Academic leadership development programmes preparing future deans and vice presidents (for example, the Big Ten Academic Alliance's leadership development programmes[17]) could, for example, be adapted to focus on the specific requirements outlined above.

Second, we should build networks that will underpin effective organizational leadership in cohort-based postgraduate programmes, to allow peer-based learning founded on shared experiences, relationships and trust among students who will fill sustainability leadership positions in government, business, civil society and academia (for example, adapting[18]). The networks forged in such training are likely to be long lasting and can be drawn on by leaders of sustainability research organizations in due course. In particular, networks of colleagues can support both aspiring and established leaders to overcome the many bumps in the road of their leadership journeys. Furthermore, mentors outside of the academy can provide essential exposure to sustainability in the real world.

Third, we must provide training opportunities where leaders can learn about and collaborate with stakeholder partners. This can be done through internships or secondments with organizations that are developing and delivering solutions to real-world challenges, such as national parks, state and federal resource agencies, indigenous nations and conservation organizations.

Finally, further research is required into leadership effectiveness in sustainability research organizations to inform the development of courses, networks and programmes outlined above.

Call for action

Although forging leadership of interdisciplinary and transdisciplinary research organizations is only one part of the effort required to achieve a sustainable world, it is nevertheless an important one and we need to act fast. We call on academia, governments and funders to create new programmes that build a highly capable generation of leaders of organizations focused on sustainability science.

We also urge an international review of capacity in leadership of sustainability research organizations and how this can be strengthened within and across countries. For example, governments in developed countries could increase investments in international programmes aimed at developing leadership of sustainability science institutions across countries (for example, building on the UK government's Global Challenges Research Fund[19]). Further, governments in developing countries, where public funds are largely used to strengthen

disciplinary research and education, could re-examine their approach to develop leaders better equipped to meet contemporary sustainability challenges.

With the competencies described here, interdisciplinary and transdisciplinary research organizations will more effectively play their role in accelerating the transition to a sustainable future. The nature and scale of the problem requires targeted leadership development programmes so that sustainability research organizations can help deliver a world that is fit for future generations.

References

1. Irwin, E. G. et al. Nat. Sustain. 1, 324–326 (2018).
2. Hull, R. B., Robertson, D. & Mortimer, M. Sustainability 11, 4 (2018).
3. Special initiatives — leadership development program. Corporate Eco Forum http://www.corporateecoforum.com/member- challenge (2019).
4. Eigenbrode, S. D. et al. Leading Large Transdisciplinary Projects Addressing Social-Ecological Systems (2017); https://www.sesync. org/leading-large-transdisciplinary-projects-addressing-social- ecological-systems
5. Palmer, L. Nat. Sustain. 1, 330–333 (2018).
6. Drucker, P. Managing the Non-profit Organization (Routledge Press, 2012).
7. Nicholls, A. (ed.) Social Entrepreneurship: New Models of Sustainable Social Change (Oxford Univ. Press, 2008).
8. Executive education. Harvard Business School www.exed. hbs.edu (2019).

9. MBA for executives. Yale School of Management https://som.yale.edu/programs/emba (2019).
10. Executive business education: degrees and short courses for experienced working professionals. London School of Economics www.lse.ac.uk/management/study/executive (2019).
11. Leshner Leadership Institute for public engagement with science. American Association for the Advancement of Science https://www. aaas.org/programs/leshner-institute (2019).
12. Liu, J. et al. Nat. Sustain. 2, 80–82 (2019).
13. Powell, W. W. et al. Am. J. Sociol. 110, 1132–1205 (2005).
14. Adner, R. MIT Sloan Manag. Rev. 58, 141–146 (2016).
15. IAP2's Public Participation Spectrum (International Association for Public Participation, 2014); https://cdn.ymaws.com/www.iap2. org/resource/resmgr/foundations_course/IAP2_P2_Spectrum_ FINAL.pdf
16. Fitzsimons, D., James, K. T. & Denyer, D. Int. J. Manag. Rev. 13, 313–328 (2011).
17. Leadership development. Big Ten Academic Alliance http://www.btaa.org/leadership (2019).
18. Gosling, J. & Mintzberg, H. MIT Sloan Manag. Rev. 45, 19–23 (2004).
19. Global Challenges Research Fund. UK Research and Innovation https://www.ukri.org/research/global-challenges- research-fund (2019).

Acknowledgements

This work was supported by the National Socio-Environmental Synthesis Center (SESYNC) under funding received from the National Science Foundation DBI-1639145. Thanks to M. Palmer, Director of SESYNC and J. Kramer, Director for Interdisciplinary Science at SESYNC, who hosted the first meeting of leaders and for participating in that meeting. The Santa Fe Institute supported and hosted a follow-up workshop on ‘Tackling Complex Sustainability Issues: Lessons from Inter- and Transdisciplinary Organizations’, which led to the production of this Comment.