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Global patterns in conservation capacity development

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ABSTRACT

Conservation is an interdisciplinary and applied field with a range of careers requiring different skills and abilities. Recent studies have identified 'miss-matches' between training available to early-career conservationists with the expectations and demands of the sector (Andrade et al., 2014; Lucas et al., 2017). Given the complexity of contemporary conservation challenges, and trends towards new ways of doing conservation that are more integrative, interactive and inclusive, the necessary 'capacity' now extends beyond knowledge of conservation science into a range of other skills and competencies. A diversity of capacity development initiatives are required to ensure that early-career conservationists around the world can seek out the necessary skills and experiences for their desired conservation career. However, at present we lack a global picture of conservation capacity provision and global priorities for capacity development in the conservation sector are unclear. Based on a review of relevant literature we focus on five focal areas of importance to contemporary conservation: policy, practice, collaboration, leadership and interdisciplinarity. Our study compiles and analyses an extensive database of 650 postgraduate-level conservation capacity development initiatives from 54 countries. We find the five focal areas to be highly correlated and postulate that this reflects requirements for foundational skills in communication, interpersonal interaction and boundary crossing. This study reveals substantial regional gaps in the provision of leadership capacity in Oceania, South and Central America, the Caribbean and all Asian regions. It also highlights a general need to strengthen policy-related capacity within conservation initiatives with other foci. These findings could help capacity development institutions, organisations and funders to improve the design and delivery of a comprehensive suite of initiatives to suit the changing needs of contemporary conservation.

1. Introduction

Conservation is an interdisciplinary and applied field aiming to conserve biological diversity globally, including tackling complex or 'wicked' challenges facing coupled social-ecological systems. Such problems are frequently multi-causal, contested and time-urgent. Demand on conservation professionals to find effective and durable responses has never been greater. To address this complexity, conservation is becoming more integrative, interactive and inclusive (Colloff et al., 2017; Duckett et al., 2016), with trends towards social awareness, transdisciplinarity and the co-production of knowledge and solutions (Beier et al., 2016; Nel et al., 2016), and a greater consideration of social, political and economic trade-offs associated with conservation actions (Álvarez-Romero et al., 2015; McShane et al., 2011). However, as the framing of conservation evolves (Mace, 2014), so too do ideas about what constitutes the necessary skills and abilities of modern conservation professionals.

Providing adequate conservation training is already a challenge given the wide range of possible conservation careers and the diverse spectrum of skills needed to perform them (Blickley et al., 2013; Muir and Schwartz, 2009). Recent studies have identified 'miss-matches' between training available to early-career conservationists and the expectations and demands of the evolving sector, which extend beyond a disciplinary scientific background and traditional, analytical and technical conservation skills (Andrade et al., 2014; Lucas et al., 2017).

Our study identifies global priorities for capacity development in an evolving conservation sector. Based on a review of relevant literature we focus on five focal areas of importance to contemporary conservation: policy, practice, collaboration, leadership and interdisciplinarity; and determine whether they are correlated. Our study analyses the largest published database of postgraduate-level conservation capacity development initiatives compiled to date and unifies disparate capacity

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focused studies by simultaneously considering global patterns in all five areas. Knowledge of these patterns will help capacity development institutions, organisations and funders to improve the design and delivery of initiatives to suit current needs. Moreover, by identifying regional gaps in service provision, programs and resources can be targeted to places of greatest need. Ultimately, the provision of a more effective, comprehensive and globally diverse suite of initiatives will address current limitations on access to capacity development, allowing more conservation focused individuals to access the breadth of skills required in contemporary conservation. Our paper provides a literature review highlighting current trends in capacity development in the five interrelated focal areas, followed by a description of our methodological approach, results and discussion with recommendations. By extending the focus beyond conservation-related disciplinary knowledge, this paper addresses a major gap in strategically considering the suite of capacities required, and provided, to support global conservation professionals.

2. Literature review

2.1. Doing conservation differently

Growing human populations and patterns of consumption have led to increasing pressure on species and degradation of ecosystems. To name a few of these drivers: climate change, urbanisation, pollution, land-use change, reclamation, fragmentation, water scarcity, and overexploitation of resources (see Maxwell et al., 2016 for recent review). Thus contemporary conservation issues are often complex and contested, and it is often impossible to find technical solutions that can be readily translated into policy and practice with win-win outcomes (Adams and Sandbrook, 2013; Beier et al., 2016; Mauser et al., 2013). There is increasing awareness that conservation science needs to innovate and engage with societal actors in order to realise positive environmental outcomes (Colloff et al., 2017; Nel et al., 2016; Reyers et al., 2010; Toomey et al., 2016), and conservation practice needs to more effectively engage with trade-offs (Álvarez-Romero et al., 2015; McShane et al., 2011).

While there have been some successes in using conservation science to catalyse action, many within the conservation community have recognised that science alone is not enough (Biggs et al., 2011; Kareiva and Marvier, 2012; Mace, 2014). The existence of a 'research-implementation' or 'knowing-doing' gap in conservation is widely acknowledged (Habel et al., 2013; Pietri et al., 2013; Reyers et al., 2010; Sunderland et al., 2009). Scientists are accused of insufficiently considering how their research translates into action (Pietri et al., 2013), while practitioners are accused of 'evidence complacency' (Sutherland and Wordley, 2017). Habel et al. (2013) subdivide such impediments into: a communication gap, stemming from a lack of incentives for researchers to publish outside peer-reviewed journals; a thematic gap which differentiates the problems faced in conservation from the issues addressed by conservation science; and a disciplinary gap between different fields of science.

This echoes calls for the 'opening up' of knowledge systems and for, "democratic ideals in the production and use of knowledge" (Cornell et al., 2013, p. 61). Such calls build on established research and practice that has identified the development of credible, salient and legitimate knowledge as critical attributes that improve knowledge uptake in sustainable development (Cash et al., 2003) and conservation (Sarkki et al., 2014), and are credited with leading to outcomes that are considered scientifically robust as well as socially relevant (Harris and Lyon, 2013). Sarkki et al. (2015) add 'iterativity' to acknowledge the importance a multi-directional relationship focused on learning can have in fostering constructive relationships between diverse science, policy and practice actors. Recognition of the various forms of evidence and knowledge that inform conservation has grown (Bennett, 2016). In addition to local and traditional environmental knowledge, this includes 'tacit knowledge' which encompasses, "not only technical information, but also the experience and proficiency needed to apply it under specific contexts, being aware of uncertainties, risks, and knowledge gaps" (Fernández, 2016, p. 173).

Efforts to change research practice have coalesced around two similar concepts: transdisciplinarity and co-production. The theoretical and conceptual differences between the two terms is beyond the scope of this paper, in essence, both concepts focus on conducting research in equal collaborations with non-academic actors (for example, communities, business, policy makers, practitioners, etc.) to produce knowledge that is relevant to a specific problem or decision (Beier et al., 2016; Lang et al., 2012; Reyers et al., 2010; Toomey et al., 2016; Wyborn, 2015). These approaches require scientists to work in ways that go against longstanding beliefs about how science should be done; both within and between disciplines, and with or for society and policy (Clark et al., 2016). Moreover, they require dedicated time, resources and capacities within individuals or organisations to broker between research, policy and practice (Bednarek et al., 2016). Transdisciplinarity and co-production support communication, mediation and translation between different perspectives, needs and objectives (Cash et al., 2006; Dilling and Lemos, 2011). Often 'boundary-spanners' with unique experiences and skillsets help to bring divergent actors together through communications and trust building expertise (Harris and Lyon, 2013).

2.2. Capacity and capacity development

Capacity is defined as the, "ability to perform functions, solve problems and set and achieve objectives" (Fukuda-Parr et al., 2002, p. 8). This multi-scale definition applies to individuals, organisations, nations and systems of actors (Mizrahi, 2004), however our focus is the development of individual, early-career conservationists. Targeted interventions aim to acknowledge and enhance existing capacities while developing new skills and knowledge. Capacity is recognised as being dynamic, something that is developed over time, rarely built from scratch (Vallejo and Wehn, 2016).

Several 'modalities' or strategies can be used to achieve different learning objectives and realise complementary skills, knowledge and abilities. Strategies may focus on: skill development, building stronger relationships, co-creation of meaning and understanding, knowing what to do, and/or knowing how to do it (Preskill and Boyle, 2008). Capacity development for conservation is delivered via a diverse range of mechanisms and not limited to disciplinary academic initiatives. Postgraduate academic programs are increasingly experimenting with cross-disciplinary and applied components (Langholz and Abeles, 2014), meanwhile a range of non-academic initiatives are offered, including fellowships, professional courses and internships (Newing, 2010).

It is pertinent for conservation students to consider the job market, as only 10% of positions available in conservation are in academia (Lucas et al., 2017) and this has implications for skill requirements. The skillsets prioritised and required by governmental, academic, non-profit and private organisations differ, however academics and practitioners were both found to require basic skills in group working, writing and critical thinking (Muir and Schwartz, 2009; Parsons and MacPherson, 2016). Universities are recommended to expand non-traditional programs (such as project management and interpersonal skills) and provide opportunities to conduct internships and collaborate with professionals, especially internationally (Lucas et al., 2017). Skills such as effective stakeholder engagement, communication of science to the public, and the ability to make decisions in complex and uncertain contexts are underemphasised in academic training for conservationists (Muir and Schwartz, 2009).

Given trends towards different ways of doing conservation, it is expected that additional capacities will be required. The following sections outline five focal areas, determined from the literature, and