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Examining Factors Influencing the Governance of Large Landscape Conservation Initiatives

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## Examining factors influencing the governance of large landscape conservation initiatives

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### **ABSTRACT**

With increasing threats facing ecosystems around the world, conservationists are looking for innovative approaches to address the complex nature of transboundary issues. Large landscape conservation (LLC) extends beyond protected area boundaries and potentially national borders. Though the recognition of LLC is growing, we have a limited understanding of what supports or inhibits LLC efforts across diverse geographies, which limits the efficacy of LLC as a strategy to combat ecological threats. Networks can provide support for individual LLC initiatives through collaboration, knowledge exchange, and resource mobilization. Despite the growth in LLC initiatives around the world, there has been a lack of research assessing a network of initiatives—research that is critical to complement individual case studies. To gain a greater understanding of LLC, we conducted a survey of the Transboundary Conservation and the Connectivity Conservation Specialist Groups of the IUCN World Commission on Protected Areas. The survey explored key factors that inhibit or support landscape-scale governance and overall success. Findings reveal key patterns and unique aspects of LLC initiatives. Additionally, this study underscored the need to address the complexity of multiple scales of governance while meaningfully strengthening relationships at the local scale, and specifically with Indigenous populations. These findings can inform best practices and management techniques to increase successful governance by managers, researchers, and other conservation professionals to support effective and equitable LLC initiatives.

**Keywords:** Connectivity, large landscape, transboundary, global networks, IUCN, World Commission on Protected Areas (WCPA)

### **INTRODUCTION**

Ecological connectivity is an essential part of ecosystem processes and supports the stability of species populations (Hilty et al. 2020). However, the dramatic fragmentation of natural landscapes is a pressing concern for global con-

servation efforts (UNEP 2019). Political and jurisdictional boundaries have been drawn with little consideration of biological diversity and ecological priorities, resulting in challenges for protecting threatened species and

ecosystems. While protected areas have contributed to conservation, they are not considered sufficient to combat threats to biodiversity (Venter et al. 2018).

Large landscape conservation (LLC) projects have proliferated to protect critical ecosystems, accommodate species movement, and restore connectivity (Vasiljević et al. 2015; Scarlett and McKinney 2016). However, LLC initiatives are complex: they typically encompass diverse jurisdictions, scales, and stakeholders (McKinney et al. 2010). While there have been great strides in establishing LLC initiatives, there are gaps in our understanding of the key factors supporting and inhibiting their success. Additionally, there is little research on how LLC engages with communities at the local scale and with Indigenous populations, both of which are critical to the success of conservation efforts (Schoon 2013).

This study explores a network of LLC initiatives through the perspectives of members of the Transboundary Conservation Specialist Group (TCSG) and Connectivity Conservation Specialist Group (CCSG) of the International Union for the Conservation of Nature (IUCN) World Commission on Protected Areas (WCPA). These international networks of experts can provide insight into multi-scale governance in LLC and the key factors that inhibit or support outcomes of LLC initiatives. The following questions guided our inquiry: (1) How do LLC initiatives differ in their focus and characteristics? and, (2) What are the factors that support or impede the success of LLC initiatives?

## CHALLENGES OF LARGE LANDSCAPE CONSERVATION

There are many complex challenges associated with the establishment and governance of LLC efforts (Beever et al. 2014; Scarlett and McKinney 2016). Shared ecological resources and diverse stakeholders across several scales can create challenges for collaboration (Guerrero et al. 2015). Additionally, LLC can require higher resource and time costs than traditional protected area conservation, accentuates power disparities between participants, involves cross-border politics and conflicts, and entails a heavy reliance on government support (Taggart-Hodge and Schoon 2016). Conceptualizing success can also be complex for LLC initiatives because of the challenges for effectively measuring and evaluating ecological and social outcomes across spatial and temporal scales (Thomsen and Caplow 2017).

As with other forms of conservation, local communities should play an integral role in the establishment and management of LLC initiatives (Chiutsi and Saarinen 2017). Yet, mismatches of ecological scales with those at which stakeholders are organized can lead to mistrust

and poor communication (Beever et al. 2014). Local community involvement can range from participation in planning to support an equitable process (Chiutsi and Saarinen 2017) to the creation of committees that can aid in achieving community representation (Schoon 2013; Bixler et al. 2016). Yet, the role of local communities in LLC can be vague and result in superficial involvement, mistrust, or lack of local support.

Indigenous community involvement and recognition of their members' deep cultural connections to landscapes are essential in LLC (Sepúlveda and Guyot 2016), yet conservation initiatives often lack Indigenous voices (Thomas and Mendezona Allegretti 2020). Indigenous communities live in areas with some of the highest global biodiversity (Schuster et al. 2019). Nonetheless, Indigenous communities have been marginalized by protected areas (West et al. 2006). Thus, there is a need to improve engagement with Indigenous Peoples to eliminate injustices exacerbated by conservation initiatives (Domínguez and Luoma 2020).

## METHODS

To investigate the key factors that inhibit or support LLC success, as noted above we surveyed members of TCSG and CCSG. While CCSG operates across all geographic scales, TCSG focuses specifically on transnational cooperation. Both groups provide resources in support of LLC initiatives and strongly influence the policy and practice of connectivity and transboundary conservation.

TCSG was launched in 2009 and has over 270 members who represent 83 countries. TCSG encourages transboundary conservation and promotes peaceful cooperation by developing resources and fulfilling the IUCN's Durban Action Plan and the Convention on Biological Diversity Program of Work on Protected Areas. Founded in 2016, CCSG is a global network of experts working to advance connectivity conservation across large land- and seascapes. CCSG has a membership of 900 representing 85 countries, with about 500 members actively contributing to the group's initiatives. CCSG members seek to enhance the conservation value of protected areas through the identification and effective management of ecological corridors and ecological networks. In July 2020, CCSG published global guidelines for connectivity conservation (Hilty et al. 2020).

This study consisted of an electronic survey administered to members of TCSG and CCSG from August to September 2019. The chairs of TCSG and CCSG assisted in developing the survey questions and organized survey distribution to their respective memberships, communicating via email and the online collaboration platform Basecamp.

Reminders were sent out to the groups twice after the initial distribution of the survey.

The survey covered several topic areas from the 2015 publication *Transboundary Conservation: A Systematic and Integrated Approach* (Vasilijević et al. 2015), including governance mechanisms, planning processes, and community engagement. Additionally, this study included topics from a previous survey conducted with the Practitioners' Network for Large Landscape Conservation, which investigated similar research questions for North American large landscape initiatives. Survey data analysis involved descriptive statistics using R statistical software to assess general trends across those participating in TCSG and CCSG.

## RESULTS

### Study sample

The survey sample included 141 total responses from the two specialist groups. Approximately 67% (N=92) of the total responses were from CCSG members and 12% (N=16) were from TCSG members; 22% (N=30) were from members of both groups. Three respondents did not identify their membership. Based on the overall membership of the specialist groups, TCSG and CCSG had response rates of 17% and 18%, respectively. More than half of the respondents (52%, N=72) self-identified as researchers who work on large landscape initiatives; 22% (N=31) self-identified as protected area managers. Thirty-nine respondents (28%) chose the option of "Other" and identified their role as executive directors, outside experts and consultants, non-profit staff, and project coordinators.

Respondents identified the countries in which they work on LLC initiatives, which were grouped by IUCN regions. Twenty-five percent (N=32) of respondents are from the North America and the Caribbean region. About 19% (N=24) of respondents work on initiatives in Africa, while approximately 16% (N=20) work in the South and East Asia region. Close to 8% (N=10) of respondents participate in transcontinental work, such as migratory flyways.

### Characteristics of large landscape initiatives

The term "large landscape" can encompass a variety of initiatives, including freshwater and marine environments, with variation in size. For example, 18% (N=23) of initiatives identified in this study are less than 202,000 hectares, while 18% (N=22) encompass more than 40 million hectares in size. Another 18% (N=22) of respondents were unsure about the exact size of the initiative in which they were engaged. The age of initiatives is relevant for understanding the growth of this field. Respondents reported that most initiatives are more

recently established: 65% (N=81) of initiatives were less than 15 years old, 26% (N=32) were between 15–30 years old, and only 10% (N=12) were older than 30 years.

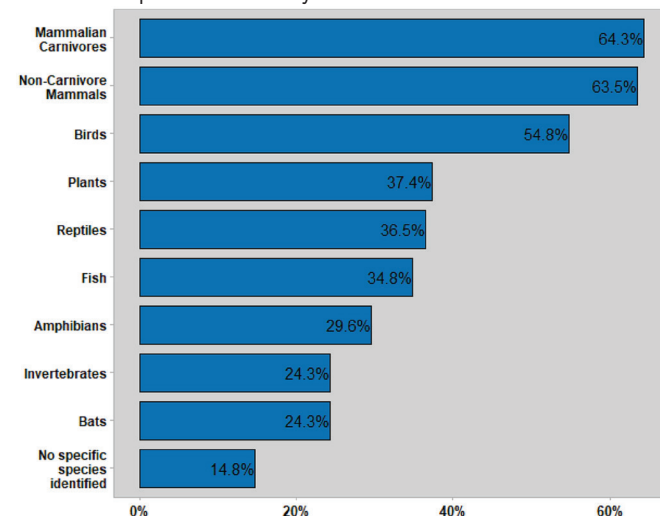
Respondents were asked to select the type of ecological realm their initiative focused on (with the option to select more than one; hence the percentages that follow add up to more than 100%). Nearly 90% (N=103) of respondents reported that their efforts focused on terrestrial landscapes, with 34% (N=39) on freshwater and 24% (N=27) on marine seascapes. Respondents could also select more than one species of focus for their initiative (see Figure 1). Approximately 64% (N=74) of initiatives focus on mammalian carnivores, 64% (N=73) on non-mammalian carnivores, and 55% (N=63) on bird species. Only 30% (N=34) of initiatives focused on amphibians, 24% (N=28) on invertebrates, and another 24% (N=28) on bats.

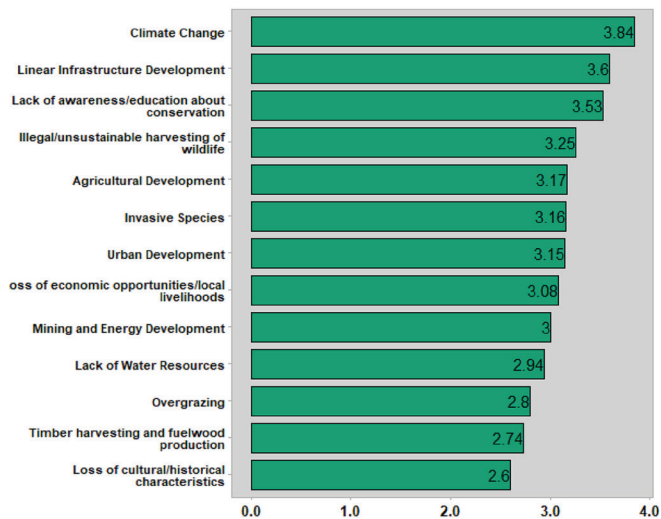
To understand the main threats that LLC initiatives address, respondents scored threats on a scale of 1 to 5, with 1 being the least concerning and 5 the most concerning (see Figure 2). Climate change is the biggest perceived threat, with an average score of 3.8, followed by linear infrastructure development (i.e., roads, railroads, and pipelines), with an average score of 3.6, and lack of awareness or education about conservation, with an average score of 3.5. Loss of cultural and historic character is seen as the least pressing threat, with an average score of 2.6.

### Factors influencing successful governance in large landscape conservation

LLC initiatives involve diverse entities (respondents could choose more than one) in their planning efforts including non-governmental organizations (84%, N=79), regional and local governments (78%, N=73), and conservation organizations (78%, N=73), national

FIGURE 1. The species focus of surveyed initiatives.





**FIGURE 2.** The average ranking from 1–5 (5 being the most concerned) of various threats to surveyed initiatives.

government officials (60%, N=56), the private sector (44%, N=41), and tourist operators (29%, N=27).

Respondents were asked to identify the greatest success of their initiative in an open-ended question (see Table 1). These 81 responses were coded for the main themes to understand how respondents perceived success. Exactly 50% (N=42) of responses focused on ecological conservation. Around 37% (N=31) of responses focused on human–environment co-existence. For the categories with the highest frequency (i.e., ecological priorities and policy, and human–environment co-existence), the responses were further coded into sub-categories. These responses reflect the respondents’ *perceptions* of success; this study did not systematically measure success of each initiative.

**TABLE 1.** Coded themes of respondents’ perceptions of success for LLC initiatives.

Categories of success	Counts and percentage	Sub-codes	Counts and percentage (within category)
Ecological priorities and policy	42 (50.0%)	Connectivity networks, landscape and corridors	8 (19.1%)
		Stewardship of biodiversity and processes	8 (19.1%)
		Species-specific focus and longevity	8 (19.1%)
		Prevent degradation and development	5 (11.9%)
		Policy and jurisdictional goals	5 (11.9%)
		Effective and adaptive management	3 (7.1%)
		Conservation areas and plans	3 (7.1%)
		Movement of genes and species	3 (7.1%)
		Human-environment co-existence	31 (36.9%)
Sustainability and sustainable use	7 (24.1%)		
Community engagement, livelihoods, and ownership	6 (19.4%)		
Collaborative partnerships and engagement	4 (13.8%)		
Implementation and management	4 (13.8%)		
Collaboration and shared vision	11 (13.1%)	Example 1: “Coordinated response sustained by a collaborative governance entity working at appropriate scales.”  Example 2: “Accomplishment of Shared Goals and Integrated Approach”	
<b>Total</b>	<b>84 (100%)</b>		

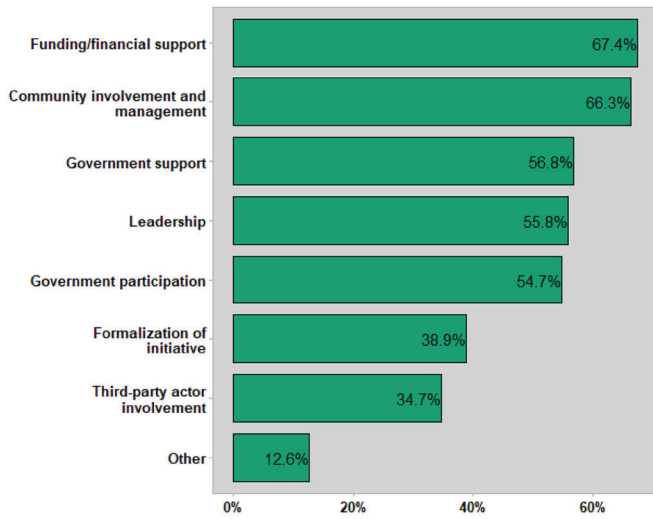
Many factors contribute to an initiative’s success (see Figure 3). Respondents could select more than one factor. Funding was the most common response (67%, N=64), followed by community management and involvement (66%, N=63), government support (57%, N=54), leadership (56%, N=53), and government participation (55%, N=52). Challenges can impede successful LLC efforts (see Figure 4). Challenges that affected initiatives somewhat mirrored the factors critical to initiatives’ success. Lack of funding (65%, N=61) is seen as the biggest challenge to success, followed by lack of coordination among actors (44%, N=41), and lack of government support (40%, N=38). Approximately 67% (N=45) of initiatives have annual operating budgets of US\$500,000 or less. In addition, 27% (N=23) of initiatives have 76–100% of their total budget secured, while 30% (N=25) have less than 25% of their budget secured.

Respondents were asked how membership in the IUCN specialist groups benefits them as individual professionals and benefits their LLC initiative (see Figure 5). For benefits to individuals, access to a network of peers (89%, N=82), access to resources (61%, N=56), and professional development (59%, N=54) were the most common. Benefits for initiatives were slightly lower for each category than benefits to individual members and substantially lower for professional development (39%, N=32) and international support (31%, N=25).

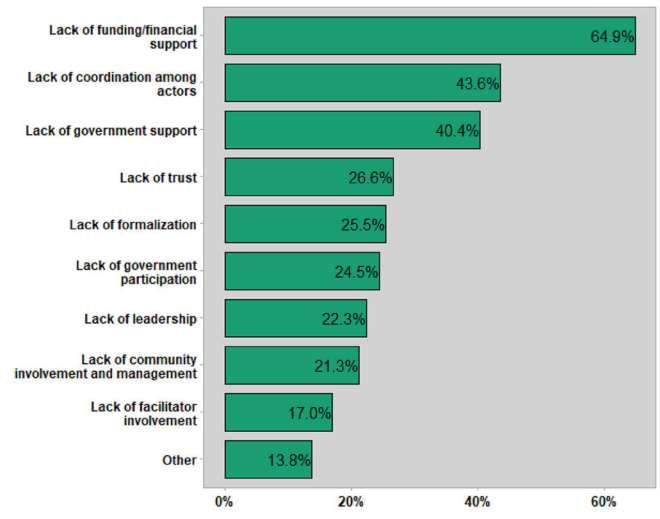
### Local community and Indigenous community involvement in large landscape conservation

The survey asked respondents about the level of involvement of local communities, and specifically

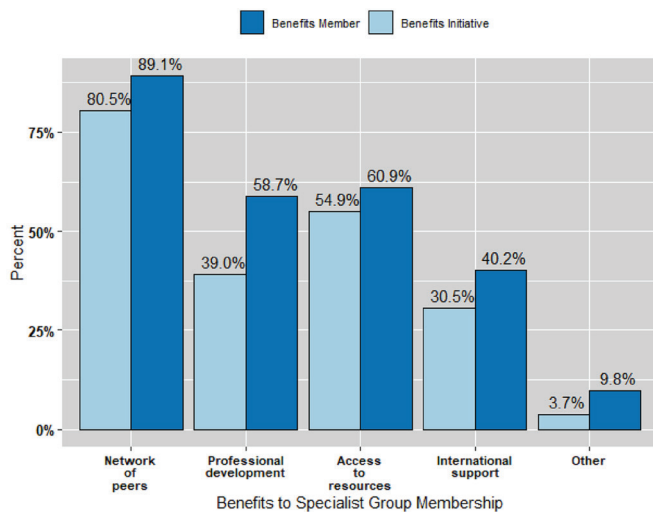




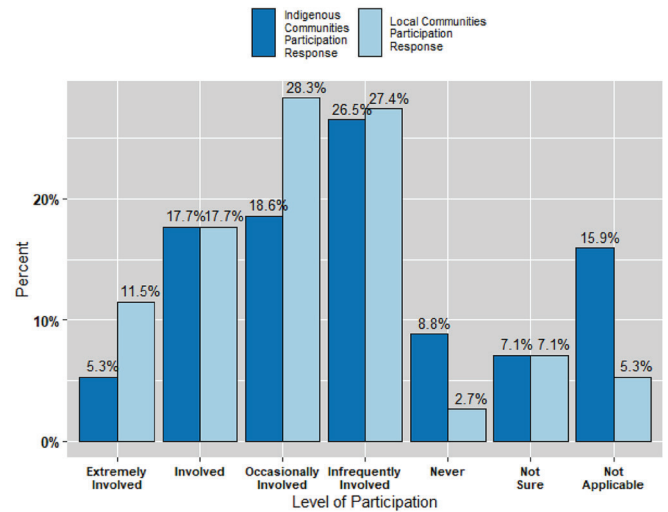
**FIGURE 3.** The most important factors for success of surveyed LLC initiatives.



**FIGURE 4.** The most significant challenges to success for surveyed LLC initiatives.



**FIGURE 5.** The benefits of IUCN WCPA Specialist Group memberships, both to individual members and to conservation initiatives.

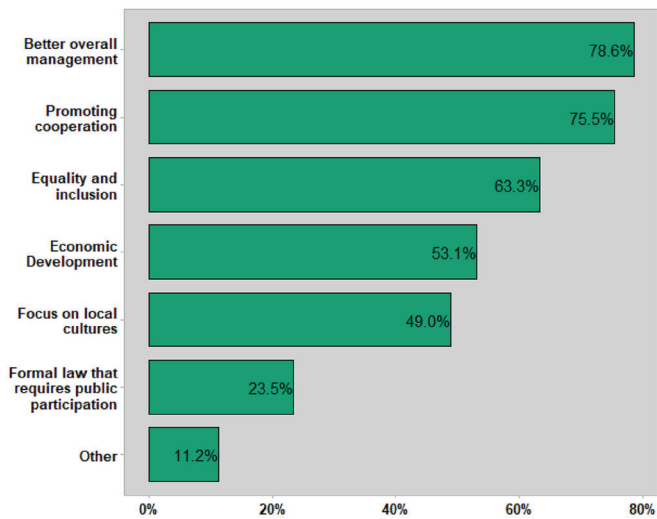


**FIGURE 6.** The level of participation of local communities and Indigenous communities in surveyed LLC initiatives.

Indigenous communities, in their initiatives (see Figure 6). Most commonly, local communities are “occasionally involved” (i.e., engaged several times a month) (28%, N=32) and “infrequently involved” (i.e., involved several times a year) (27%, N=31). Indigenous communities are “infrequently involved” (27%, N=30) or “occasionally involved” (19%, N=21) in initiatives. Only 12% (N=13) of local communities and 5% (N=6) of Indigenous communities are involved every day in large landscape initiatives. It is important to note that 16% (N=18) of respondents indicated that Indigenous community involvement was not applicable to their initiative, which may mean that there are not opportunities for engagement.

Local and Indigenous communities engaged with LLC mainly through consultation (75%, N=76) and decision-

making (58%, N=59). Only 12% (N=12) of initiatives give communities autonomous management, demonstrating that large landscape work is often driven and managed by those outside of local communities. There were different motivations for including and involving local communities in LLC initiatives (see Figure 7). Respondents view better management (79%, N=77) and promoting cooperation (76%, N=74) as the primary motivations for working with local communities, followed by equity and inclusion (63%, N=62). The least common reason (24%, N=23) for working with local communities was existence of a formal law that requires public participation in conservation. When respondents were asked about the types of data used in their conservation initiatives (see Figure 8), quantitative data on species habitat (81%, N=67) and expert opinion (76%, N=63) were the most common sources reported. Yet, only 55%

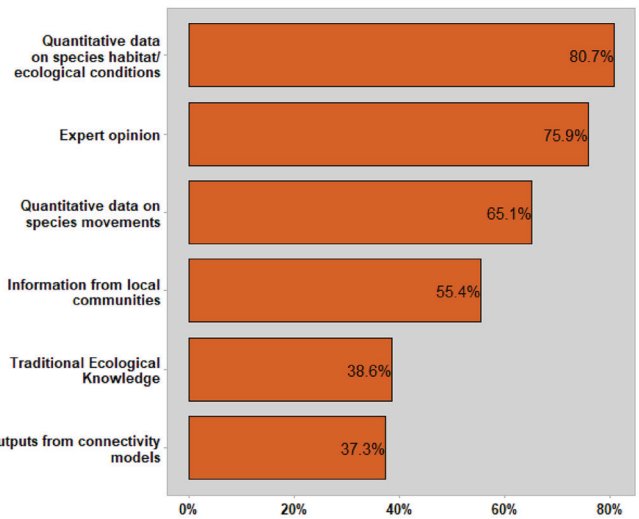
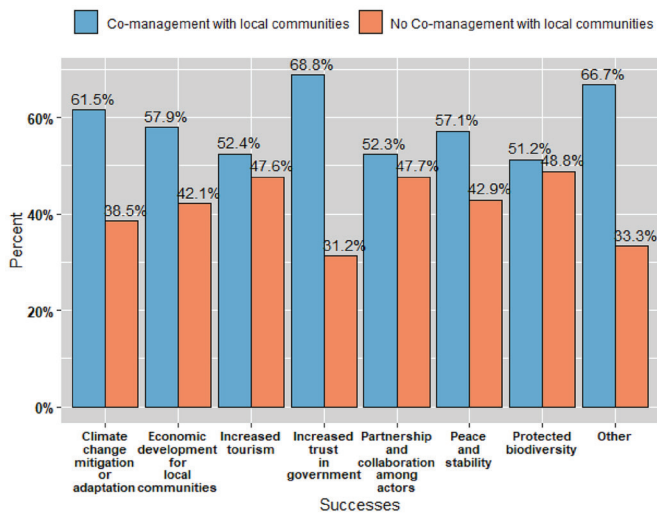


**FIGURE 7.** The reasons for local community inclusion in surveyed LLC initiatives.

(N=46) of initiatives incorporate information from local communities and only 39% (N=32) utilize traditional ecological knowledge.

The results indicate some distinct benefits to working with local and Indigenous communities. Overall, there seemed to be higher long-term success rates for those who engage in co-management with local communities (Figure 9). For example, of those who reported “Increased trust in government” as a long-term success, 68.8% of respondents reported that locals retain a co-management role, compared to 31.2% whose initiatives did not have co-management. The relationship between working with local communities in the planning phase of LLC initiatives and the use of traditional ecological knowledge was significant in a Fisher’s exact test ( $p < 3.233e-13$ ).

**FIGURE 9.** The long-term successes of initiatives according to whether local communities had a role with co-management or not. The percentages exceed 100% because this figure displays the results of a “check all that apply” question, where respondents could select more than one answer.



**FIGURE 8.** The types of data utilized in surveyed LLC initiatives.

Involving local communities can help diversify the kinds of information and data available for planning and implementing LLC initiatives.

## DISCUSSION

### Large landscape conservation is a growing field with specific focus areas

LLC efforts form a global strategy in conservation that is growing rapidly (Baldwin et al. 2018). Our study emphasizes the emergence and growth of the field, as the majority of initiatives included in this study were less than 15 years old at the time of the survey. While survey respondents were most commonly based in North America, many surveyed LLC initiatives were located in Western Europe and Southern Africa. Although CCSG had 14% of members from Asia, 13% from South America, and 12% from Oceania, there was inadequate representation of these regions in the surveyed initiatives, which may reflect varying levels of member engagement in the specialist groups. More studies in geographically under-represented areas, such as Northern Africa, the Middle East, Central Asia, and Latin America, are needed to further understand how LLC varies in form across specific local geographic contexts.

There was great variation in the scale and scope of LLC initiatives, demonstrating the wide applicability of the term “large landscape.” The role that scale may play in LLC is not fully understood; however, as large landscape initiatives grow in total area, they may become more complex in terms of governance and engagement with local communities (Curtin and Tabor 2016). The range in size of large landscapes may be associated with different needs and challenges that reflect the nuances of how we interpret “large landscape.” It is important to assess how these size and scale differences can influence LLC challenges and success.

In line with other trends in conservation science, mammals were the dominant focus of surveyed initiatives (Trimble and Aarde 2010). This trend is concerning because the prioritization of mammal species implies that non-mammal species may be overlooked despite their critical ecosystem functions and vulnerability to climate change and other stressors. A recent study estimates that around 50% of amphibian species are threatened with extinction (Gonzalez-del-Piego et al. 2019), yet less than a third of the initiatives represented by the study respondents focused on amphibian conservation. LLC aims to be more holistic in its strategies for protecting ecosystems and biodiversity (Curtin and Tabor 2016), but our study highlights the need for more diversification in species prioritization. Mammals can serve as umbrella species due to their larger geographic range, which can in turn support the conservation of species with smaller ranges within the same landscape (Wang et al. 2021). However, other species may still require specific strategies for their conservation success.

### Challenges and factors influencing success

This study showed that there is great variation in the perceptions of success in the field of LLC. Respondents' perceptions of success indicate that half of the initiatives are deemed a success based solely on ecological metrics. This is telling, given that community involvement and management was the second most frequently cited factor for success among respondents. Though many LLC initiatives intend to operate through less hierarchical forms of governance, most of the surveyed initiatives display top-down governance that excludes or inhibits community involvement. There is a need to better understand how LLC is perceived locally and how to integrate and bridge governance across scales. It is also evident that any definition of LLC success should include a social aspect, given the many communities and stakeholders that reside in these multi-jurisdictional, multi-use landscapes.

Financial support was reported to be both the most important factor for success and the biggest challenge, which mirrors another study of select LLC (Beever et al. 2014). LLC occurs on a much larger scale than protected area conservation, so long-term funding typically requires stitching together from several sources (McKinney et al. 2010). This situation makes it difficult to sustain LLC initiatives. Regular engagement with stakeholders and integration of multiple objectives into initiatives can be useful to sustain LLC over time (Beever et al. 2014). Leadership and government support were important factors for successful governance, demonstrating the role of national and international actors and institutions in furthering LLC initiatives. These key factors are more challenging given the multi-jurisdictional nature of connectivity conservation efforts (McKinney et al.

2010) and emphasize the importance of partnerships to work collaboratively across scales on LLC (Thomsen and Caplow 2017).

Inclusion and engagement of communities across scales is necessary for conserving large landscapes (Curtin and Tabor 2016). Findings indicate that local community involvement—up to and including community management—was recognized as important for success; however, the findings also suggest that current levels of involvement are not adequate. For holistic approaches to landscape conservation, local stakeholders must be included throughout the process (Bartuszevige et al. 2016). We recommend that local and Indigenous communities be involved in LLC initiatives from the beginning stages of planning and development through establishment and everyday management. Communities should be treated as equal partners with equitable power in decision-making. This requires conservation practitioners to give up some power in decision-making and allow for prioritization of goals beyond ecological objectives or measures. While the ideal frequency of engagement depends on context, the most common responses in this survey indicated communities were engaged with several times a month and several times a year. We urge practitioners of LLC to increase this frequency, as more regular engagement with communities should be a standard practice for the field. The multi-jurisdictional aspect of LLC initiatives implies that many communities are directly affected by conservation activities. Moreover, the different scales of LLC make engagement and coordination with partners a challenge (Beever et al. 2014) and issues of trust and power in stakeholder engagement must be addressed (Thomas and Mendezona Allegretti 2020). Indigenous voices are extremely under-represented in conservation efforts (Thomas and Mendezona Allegretti 2020) and the results from this study mirror that. The overall benefits of Indigenous collaboration seem apparent to respondents, yet many LLC initiatives do not engage with Indigenous populations. Large landscape and transboundary conservation cannot avoid engagement as Indigenous communities have land rights that include roughly 40% of terrestrial protected areas and preserved landscapes around the world (Garnett et al. 2018). Recognizing exclusion, injustices, and marginalization of Indigenous communities in conservation is essential for supporting equity and justice in present and future LLC initiatives.

While the researchers do not intend to provide a single, catch-all definition of success for LLC, and this study has shown that experts and practitioners have varying conceptualizations of success in LLC practice, the results highlight that common keys to initiative success



include stable financial resources and support, sustained community involvement, government support and participation, and strong, multi-scalar leadership. The majority of respondents selected these as factors for success, indicating that they are common to LLC initiatives in different regions, stages, and ecosystems. Thus, the establishment of permanent financing mechanisms for LLC initiatives is needed, as well as more guidelines on the roles of both local communities and national governments. Lastly, there is a demonstrable need to provide more guidance on LLC initiative governance that includes cultural dimensions that can be replicated across diverse social–ecological systems.

## CONCLUSION

Despite the growth in LLC, there has been a lack of research assessing characteristics and trends across a network of initiatives—research that is sorely needed to complement individual case studies. While great strides have been made in LLC, some regions remain under-represented in expert networks. Moreover, there is a need to better understand how local communities are engaged with top-down and bottom-up approaches. The observations from this study suggest that an understanding of success in LLC provides a foundation for further dialogue about the interdisciplinary nature of the field and the critical importance of human dimensions and involvement of local communities in achieving ecological goals.

This research serves as an exploratory study to understand LLC initiatives, and there were several limitations that can be overcome in future research. First, the study was limited to the members of two IUCN WCPA specialist groups; there are undoubtedly other initiatives that were not represented by these memberships. Second, there were gaps in geographic representation from the respondents, most likely due to the online format and having English as the only survey language option. Lastly, findings are reflective of respondents' perceptions of challenges, success, and engagement with communities; however, not all relevant views are represented in this survey. Future research can expand on the foundational topics explored in this study using a network approach complemented with case study research to provide more in-depth analysis. This broad assessment serves as a starting point for further research with these specialist groups and other LLC networks. Future research is needed to bring into deeper focus topics such as policy tools and financial mechanisms for LLC. In addition, it would be helpful to repeat this assessment in the future to assess trends and the evolution of LLC over time.

Overall, we hope that this study and article can stimulate dialogue and assist in improving LLC's inclusivity and

an understanding of the factors that can support these initiatives in achieving their desired outcomes.

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This viewpoint of a Union soldier facing Pickett's Charge reveals a pivotal moment at Gettysburg, foreshadowing the Civil War's outcome.

GARY E. DAVIS