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Lessons from a conservation and tourism cooperative: the Namibian black rhinoceros case

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ABSTRACT

Wildlife-based tourism is widely promoted as a conservation tool, yet controversy surrounds its net contributions. Procedural problems are under-appreciated and originate from an under-attention to people: their interactions, values at play, and matters of special, shared, and common interests. We offer a case in Namibia of black rhinoceros conservation tourism that attended simultaneously and systematically to the inter-related ecological and social processes involved. We demonstrate how an understanding of social context and the decision making process developed, how outcomes were evaluated and synthesized lessons into prototypic elements as a pneumonic that we term the 'ACE approach': (1) establish an *Arena* for inclusive, open debate; (2) identify and use *Conservation-oriented messaging*; (3) adopt participatory *Evidence-based management* for action, feedback, and learning.

Introduction

Conservation & tourism

Wildlife tourism has experienced tremendous global growth, particularly in developing countries (Balmford et al., 2009; Karanth & DeFries, 2011). Tourism is a wildlife utilization that is widely promoted as beneficial to conservation (Buckley, 2012; Naidoo et al., 2016). But disagreements over wildlife utilization and management are the source of considerable and globally ubiquitous conflict among environmental stakeholders (Batavia et al., 2019; Buckley, 2013; Naidoo et al., 2016; Rastogi, Hickey, Badola, & Hussain, 2013). Tourism can provide significant conservation benefits, however Buckley (2012) and Morrison et al. (2012) note that it is not a

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panacea for challenges to the conservation of wildlife. Tourism can have negative outcomes due to technical and operational errors which are well documented in the literature, including tourists and tourism disturbing and displacing wildlife, or degrading their habitat (Bejder et al., 2006; Corkeron, 2004; Griffin, Valois, Taper, & Scott Mills, 2007; Lott & McCoy, 1995; Lusseau, 2003, 2004; Preisler, Ager, & Wisdom, 2005; Trathan, Forcada, Atkinson, Downie, & Shears, 2008). Additionally, negative outcomes may come from weak decision-making processes (Brunner & Clark, 1997) if they are dominated by aggressive, dogmatic business entrepreneurs (Garen, 2000), or local powerful elites capturing benefits and depriving communities of resources and opportunities (Hoole & Berkes, 2010), and for a diversity of other reasons (Mitchell & Muckosy, 2008).

In all cases, the outcomes of wildlife tourism depend on the people and 'systems' involved. Conservation is always a process as individuals and groups with a diversity of values simultaneously navigate and interact in a complex and dynamic socio-ecological system characterized by idiosyncratic cultural and ecological contexts. Dysfunctional relationships and decision-making, and the choices made and standards used, directly affect outcomes (Wilkinson, Clark, & Burch, 2007). It is thus prudent to adopt a systematic approach to decision-making to avoid, mitigate and resolve conflicts among stakeholders. Such an approach should be embedded within a systems perspective that seeks to meld wildlife conservation and tourism attempts to identify and enable the stakeholders, interactions, factors and information.

For more than two decades, efforts to link wildlife tourism with rural development in Namibia under the national public-private conservancy model has been a major contributor towards achieving progress in wildlife conservation. Namibia's conservancy model is a legally-recognized, self-governed local institution that provides both communal land residents and private landowners who form a conservancy the management and benefit rights over the natural resources within its boundaries (NACSO, 2019). It is overseen by the Namibian Ministry of Environment and Tourism which critically supports legislation that mandates that any private sector tourism operator seeking to pursue commercial tourism on conservancy land must enter into contractual agreements, including a benefit-sharing arrangement, with the respective conservancy. A consortia of conservation NGOs provide support to registered conservancies in natural resource management, governance and enterprise development. Despite notable successes (NACSO, 2019), a number of problems and conflicts have also occurred, especially between tourism and conservation stakeholders (Bollig, 2016; Hoole, 2010; Pellis, Duineveld, & Wagner, 2015; Schnegg & Kiaka, 2018). The Namibian private tourism-conservancy institution, therefore, is a complex socio-ecological system. It provides a useful case-study in the organization, process and outcomes of collaborative wildlife tourism and conservation.

In this article, we describe a wildlife tourism cooperative case as a strategy for improving conservation outcomes for a free-ranging critically-endangered black rhinoceros population in north-west Namibia (Brodie et al., 2011). Operationally, the technical and ecological challenge was to manage human (tourism) activity given rhinoceroses' sensitivity towards people (Cunningham & Berger, 1997; Lott & McCoy, 1995; Muntifering, 2016). Research and management sought to prevent or mitigate the technical challenge of indirect impacts of tourist infrastructure and activity on rhinoceros habitat use (Muntifering et al., 2019) and direct disturbance from tourist-rhinoceros encounters on foot (Muntifering et al., 2018). However, a timely and inclusive management decision-making process is also required for effective conservation particularly for multi-stakeholder initiatives that encompass a diversity of values and perspectives. By addressing the underlying issue of inadequate decision-making, we illustrate how the science and practice of conservation tourism can be advanced. Specifically, our case study was undertaken to demonstrate: (1) how an understanding of the social context and the decision-making process developed, (2) how outcomes were evaluated for effectiveness (failures as well as successes) to inform the process, and (3) what the important prototypic elements were. We represent the prototypic elements with a pneumonic (ACE), that represents an effective operational model (sensu Knight, Cowling, & Campbell, 2006), in this case for securing black rhinoceros conservation tourism as a common interest, that can be adopted more widely.

Methods

Study site

The Desert Rhino Camp (DRC) that we studied as a prototype is a private commercial tourism lodge within the 5800 km^2 government-administered Palmwag Tourism Concession (13° 56′13″E, 19° 53′12″S) in north-western Namibia. The area receives approximately 50–100 mm of rainfall per annum across an elevation range from 300 m on the gravel plains to 600 m on the largest flat-topped Etendeka mountains (Mendelsohn, 2010). Despite being presently promoted as a large 'wilderness' area, influenced by a century of shifting locations of the veterinary fence that has played a key role in restricted access of people and livestock (Miescher, 2012), the area has a rich historical context of human occupation and use including traditional settlements, gravesites and both plant and animal harvesting (Sullivan, Hannis, Impey, Low, & Rohde, 2016). In fact, DRC is situated next to a water post used by livestock farmers up until the then South African government's Odendaal Commission forced re-settlement in the 1970s (Owen-Smith, 2010). Presently, DRC operates as a joint venture between a private tourism company (Wilderness Safaris-WS), local NGO (Save the Rhino Trust-SRT) and three adjacent Community Conservancies (Anabeb, Sesfontein & Torra) where 3666 people reside (NACSO, 2019; Thouless, Diggle, & Sikoppo, 2014). DRC specializes in black rhinoceros-based tourism, supports rhino monitoring and research (Buckley, 2010), and has exclusive commercial tourism access to approximately 1365 km^2 to conduct their trademark black rhinoceros tracking safaris (Muntifering et al., 2018).

DRC can accommodate 16 guests in 8 en-suite safari-style canvas tents distributed around a central 'lapa' which is used as a lounge, dining and campfire area. Between 2008 and 2012, the average monthly occupancy at DRC ranged from roughly 150 to 200 bed-nights (approximately 41%) including 100 guests. The majority of these guests stayed for two nights to ensure a full day for the rhinoceros tracking activity and arrived by small aircraft using the remote airstrip located approximately 5 km (Euclidean distance)

from the camp. The guests visiting DRC are almost exclusively foreign visitors with the majority visiting from Germany and United States (Muntifering, 2012).

The policy sciences & prototyping

We employed the policy sciences as an integrative and practical framework grounded in decades of experience, theory, and learning (Clark, 2002; Clark & Wallace, 2012) to better understand how our case at DRC operated in terms of its actual social dynamics, decision-making processes, and outcomes. Our observations and associated recommendations were framed on a prototyping approach, a trial intervention designed to reflect upon systematically and learn about the conservation case by iteratively finding and correcting errors, to identify lessons that not only improve our efforts but also provide a template to guide future action (Clark, Reading, & Backhouse, 2002). Prototyping efforts are typically managed by a small group of researchers/initiators who are deeply concerned with contributing to knowledge and professional skill and are committed to the success of the project (Lasswell, 1963). Prototyping is a proven technique for enhancing effectiveness in contexts characterized by complexity, uncertainty, and potential for conflict among parties. As such, however, prototyping does not share the high degree of control represented within scientific experiments, as it involves embracing the spontaneity, originality and uncertainty inherent in social systems. Thus precise prediction about which strategy will be most effective at the outset is not possible nor advisable (Clark, 2002). Due to both the social and ecological complexities of our study system as described above and elaborated upon below, we considered our case at DRC to be prototypical.

It is important for prototypes to clearly describe actions taken during the trial intervention (Clark et al., 2002). In order to accomplish this we applied the policy science's decision process framework which consists of seven interrelated functions including planning, debate, deciding, implementing, monitoring, adapting and appraising that can be characterized by a set of activities and performance criteria (Clark, 2002). We examined, described and evaluated all decision process activities involved in the DRC case by first grounding our review of the decision process by examining the social context – who participated, with what perspectives, in which arenas, using what base values, in what strategic ways to generate what outcomes in reference to each of the decision functions (Clark & Willard, 2000) at both the broader, oversight scale and the operational, enterprise scale. This systematic process that specifically seeks to integrate learning with management actions is similar to the adaptive environmental assessment and management model (Gunderson, Peterson, & Holling, 2008). We illustrate the convergence of the two conceptual models in Fig. 1. Second, we assessed the adequacy of each decision function using widely recognized standards as posited by the policy sciences (Clark, 2002). Third, we draw from our contextual analysis of the decision process to recommend or synthesize prototypic elements from our case that could be transferred to other conservation-oriented tourism cooperatives. We have included detailed descriptions of these methods in a Supplementary Materials section.

We selectively focused on two decision points that had direct impact upon DRC's operational sustainability that drive rhinoceros displacement by tourism (Muntifering et al., 2019)(Muntifering et al., 2018) More specifically, we examined how best to manage: (1)

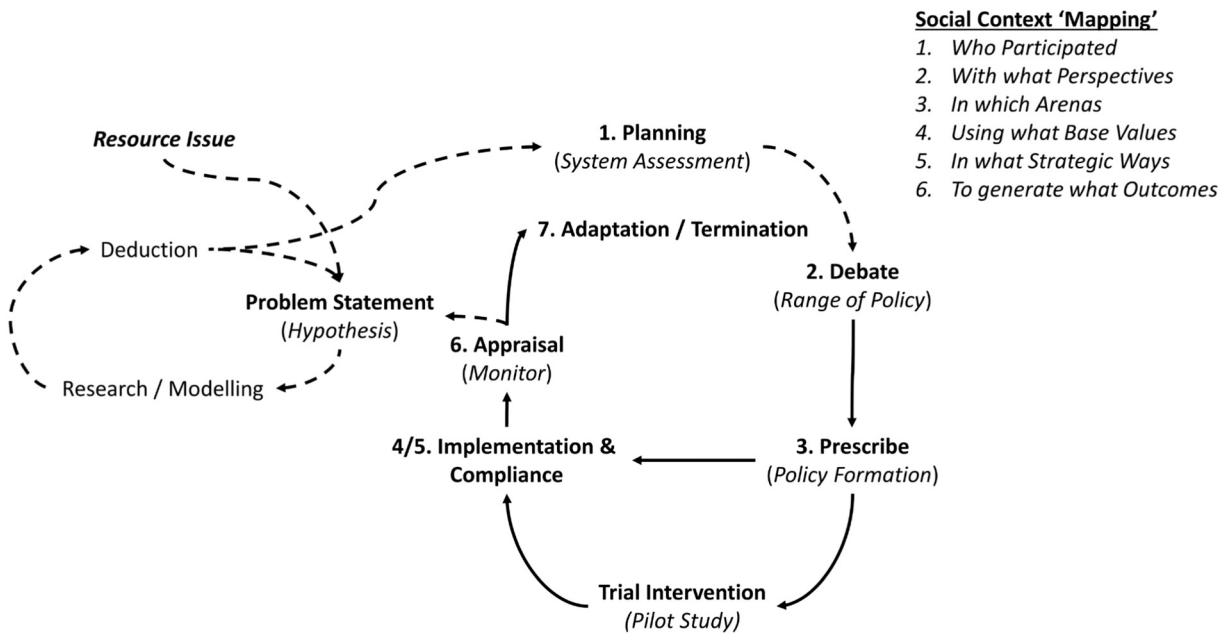

Fig. 1. Diagram illustrating the convergence of the adaptive environmental assessment and management model (Gunderson et al., 2008), with terms indicated in *italics,* and the policy science's decision process framework, terms indicated in **bold**, including the social context 'mapping' conducted for each of the seven decision functions (adapted from Clark 2002). Dashed lines represent assessment phases while the solid lines represent adaptive management.

tourism infrastructure placement and vehicle intensity across DRC's operational area and (2) direct encounters between tourists and rhinoceros as they both are linked directly to our main policy management problem.

Base information was primarily obtained by personal observations obtained by the lead author who led the prototyping exercise by taking notes during numerous informal and formal meetings while participating in the all aspects of the program since its inception in 2003 as what Adler and Adler (1987) refer to as an 'active member' within his role as *adviser* to SRT (see Supplementary Section that clarifies his observational standpoint). External consistency was assessed by cross-checking observations with statements and associated sentiments from various individuals representing the stakeholders captured within ten unpublished reports and joint management meeting minutes (that were reviewed and approved by both WS and SRT participants) recorded on-site between 2003 and 2012. Furthermore, we conducted four focus group meetings between 2014 and 2015 that included two SRT trackers and three WS guides who had worked at DRC since 2010 to further capture participants' perspectives. This diverse set of 'data' gave us a picture of the social and decision-making context for determining its effectiveness.

As a limitation, we note that ideally the appraisal aspect of the study would have been conducted by an independent observer. However, in our case, due to both the sensitivity of information often being discussed (e.g. such as rhinoceros locations) and the need for established long-term trust to obtain full access to the decision process, this was not practical. As this study's objective sought to generate knowledge and share lessons learned, every effort was made to remain objective and reduce any potential biases in the interpretation of evidence particularly from firsthand experiences. It should also be noted that since this study adopted a prototyping approach, although failures are noted throughout, the majority of descriptive text focuses and elaborates more upon what worked. Prototyping is comparable, and in many ways interchangeable, with the well-established action research methodology in that it seeks not only to generate new knowledge but also improve the practice of a specific endeavor, be it a product or experience. According to Koshy et al. (2010), action research is a process that involves action, evaluation, and critical reflection which then suggests adaptations to be implemented based on the evidence gathered. Specifically, the researcher typically employs participant observation and interviews as primary sources for data collection while applying very little, if any, control on the environment being studied (Kock, 2013). Both protoyping and action research have clear departures from more academic, hypothesis testing forms of research in that they are based upon strong practical experiences rather than an underlying theory, as well as do not require rigorous statistical testing and experimental designs including randomized sampling and assumptions of independence.

Findings

Stakeholders and values

Multi-participant discussions among government, local communities, conservation organizations and private sector tourism in the early 2000s broadly set the formula for our black rhinoceros-based tourism cooperative (Hearn, Kruger, & Brett, 2004). The case in Namibia's northwest sought to improve protection of rhino from illegal hunting through increased field presence, rhinoceros monitoring, and sustainable financing from emerging tourism opportunities all targeting successful wildlife tourism (Hearn et al., 2004; Muntifering et al., 2017). It did so by a complex transaction of values we describe below.

Our initial goals expanded following the initiation of a prototypical rhinoceros tracking safari camp (DRC) to include broader goal values sought by local people, including respect, shared power and, more recently, skills development (Muntifering et al., 2017). The general roles and relationships of the various participants in the evolving partnerships were formally linked through a network of contractual arrangements at various spatial scales (Fig. 2), from the national-level down to the individual local enterprise.

At the national and regional level, the Ministry of Environment and Tourism (MET) used their authority and control to uphold their responsibilities as formal owners of all Namibia's black rhinoceros. They led law enforcement, all biological management activities, and coordinated contracts for leasing tourism rights on government-administered tourism concessions (e.g., Palmwag Concession). Conservancies used their interests and resources to increase benefits from rhinoceros tourism for their members by entering into contractual agreements with private sector tourism (i.e., WS). This improved income opportunities (i.e., wealth for their Conservancy and members), as well as enhanced respect from members. Traditional Authorities, which retain legal powers over land allocation, also exercised their authority (power) over land allocation thus maintaining local respect and friendly relations by ensuring only land uses compatible with conservation are practiced in areas that support black rhinoceros (Table 1).

Whereas MET, the Traditional Authorities and Conservancies were actively engaged at a high-level during the establishment of DRC, the operational policies and procedures were largely formulated and implemented through a bilateral partnership at the enterprise level (where this analysis is focused) between the private sector tourism operator (WS) and conservation organization (SRT). Scientific and technical support was provided from the Minnesota Zoo (JM) who also serves as advisor to SRT. WS exercised their wealth, skills, knowledge and rectitude (ethics) to obtain more wealth and respect for themselves and partners by supporting conservation and rural development. At the same time, they enhanced their business through unique conservation partnerships with conservation organizations like SRT. SRT improved their financial sustainability and offered new knowledge and more respect, as a leading rhinoceros conservation organization. By utilizing their skills and knowledge, SRT played a pivotal role to help pioneer a novel approach (a prototype) to harmonize tourism with rhinoceros monitoring. In doing so, they also upheld their mandate with MET to provide rhinoceros monitoring information. The Minnesota Zoo used its knowledge, skills and rectitude to gain more knowledge and respect as a key on-the-ground partner supporting in situ conservation in Africa (Table 1).

Since the purpose of this study is to describe, assess and make recommendations that improve the operation-level decision-making at DRC, we chose to focus our analysis on the bilateral partnership between WS and SRT (Fig. 2). Specifically, we analyzed the strengths, limitations, and lessons learned for each decision process function by tracking two key policy processes: the Rhino Viewing

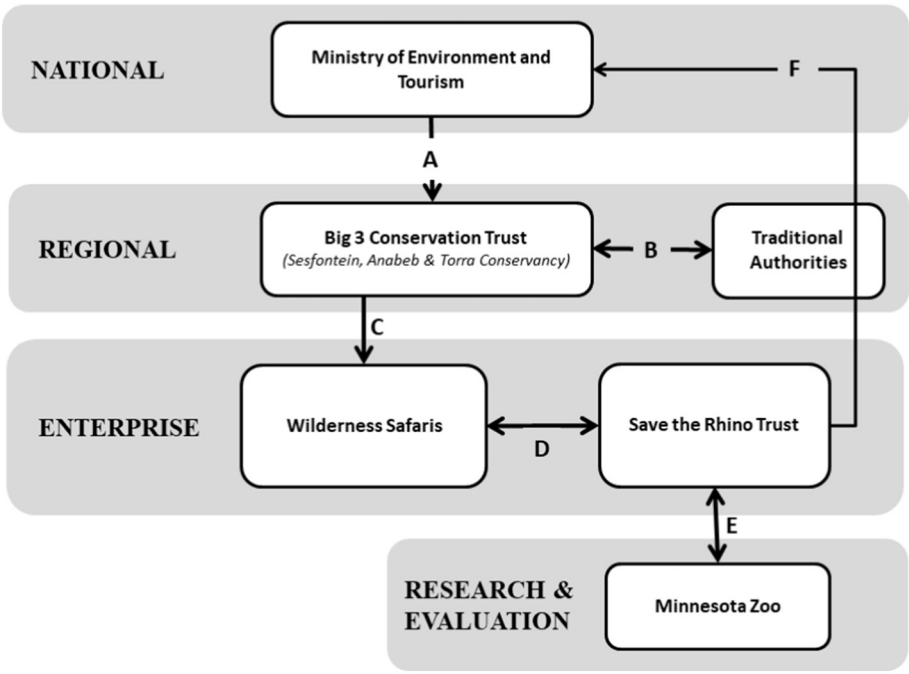

Fig. 2. Diagram illustrating the contractual linkages between the multi-stakeholder partnership that is Desert Rhino Camp. Ministry of Environment and Tourism have a formal contract releasing tourism rights over the Palmwag Tourism Concession Area to the Big 3 Conservation Trust (A). The Big 3 Conservation Trust work with Traditional Authorities to ensure no harmful land use practices are allocated into the tourism area (B). The Big 3 Conservation Trust contractually sub-lease the tourism rights to Wilderness Safaris for the exclusive use of a portion of the Palmwag Concession Area (C). Wilderness Safaris and Save the Rhino Trust have a formal Memorandum of Understanding to guide the execution of a rhinoceros conservation partnership at Desert Rhino Camp (D). Save the Rhino Trust and the Minnesota Zoo have a semi-formal partnership to collaborate on research and evaluation (E). Save the Rhino Trust have a formal MOU with the MET to conduct rhinoceros research, monitoring and training in northwest Namibia particularly providing regularly monitoring information to MET (F).

Policy and the Area Use Policy. Results are summarized in Table 2 and the next subsections will attend to each specific 'function' of the decision process. Fig. 3 provides a timeline summarizing the temporal element of the evolving policy process at DRC.

Intelligence sharing

The *Intelligence (Planning) Function* involves gathering site-specific information, clarifying programmatic goals and planning and predicting outcomes. Both WS and SRT participated in the planning function, to varying degrees, emphasizing and providing specific information. Both contributed equally in the initial steps of assessing trends (i.e., rhinoceros were being displaced), projections (if we don't adapt both the business and conservation efforts they will both suffer), and goal setting (minimize rhinoceros disturbance while maximizing guest experience and monitoring outcomes). The collection, compilation, and dissemination of information was divided and shared. SRT focused almost exclusively on providing ecological information on rhinoceros and WS focused on recording guest reviews and occupancy. Information on rhinoceros that was collected and analyzed by SRT was in turn made available in internal reports and presentations to WS and other relevant parties (such as MET). It was further made available in various information boards and booklets on display at DRC, and in tourist information from WS upon request. Despite both parties having different priorities, needs, and expectations for information, efforts to exchange and transfer knowledge and skills improved collaboration. For example, SRT's trackers gained an appreciation of the difficulties with delivering a world-class guest experience and WS guides' interest in and respect for rhinoceros behavior and welfare also increased when trackers shared their rhinoceros knowledge.

Forum

This transaction and transformation was likely catalyzed by a milestone decision to create a joint, inclusive policy arena, known as the DRC Forum. The Forum served a critical purpose in facilitating the shaping and sharing of all values, perspectives, and ultimately establishing a set of shared, common interest management options. The DRC Forum met every three months and led to the early establishment of a collectively-determined common goal for the rhinoceros tracking activity. This goal embodied both SRT's and WS's expectations and value demands. For instance, the open, transparent and respectful nature of the DRC Forum meetings created an environment that motivated and enabled both SRT and WS to demonstrate a willingness to share power, show mutual respect and provided opportunities to gain insight and skills through creating new knowledge and offer inter-organizational training. The DRC

Table 1
Summary of the social process using feature analysis for all participants in the DRC policy process.

Participants	Ministry of Environment and Tourism (MET)	Local communities (Big 3)	Traditional authorities	Wilderness Safaris	Save the Rhino Trust	Minnesota Zoo
Arenas	Government agency responsible for protected areas (including concessions) management. All black rhinoceros in Namibia are owned by the government who oversee all management including the Communal Rhino Custodianship Programme	Torra, Anabeb and Sesfontein Conservancies officially gazetted in 1998, 2003, and 2003, respectively. Received tourism rights over Palmwag Concession in 2011 from MET and re-negotiated tourism contract with WS for DRC in 2011. Registered Communal Rhinoceros Custodians with MET.	Responsible for allocation and dispute resolution of land primarily for human settlement under the Traditional Authorities Act embedded within Namibia's Constitution.	Founded in 1983 and operate over 40 high-end tourism lodges in 7 countries across Africa. Opened DRC in 2003 in partnership with SRT.	Founded in 1982. Extensive field experience and skills in rhinoceros monitoring and hold a mandate for this work with MET. Lead training activities in rhinoceros monitoring and tourism. Entered into first tourism partnership with WS at DRC in 2003.	US-based zoological institution founded in 1978. Partnered with Save the Rhino Trust in 2009 to provide science leadership and community-based support for rhinoceros conservation in Namibia.
Perspectives	Protected areas and rhinoceros management. Research oversight through permitting.	Improve rural livelihoods through local empowerment and sustainable wildlife-based income generation	Ensure local people have access to and benefit from land for grazing and other traditional land uses.	Deliver world-class, authentic tourism experiences that benefit conservation and rural economies	Rhinoceros conservation and improving the value local people attach to saving rhinoceros	Conduct credible applied research and help facilitate decision-making as 'honest broker'
Base values	Power, Rectitude	Power, Skills, Rectitude	Power, Rectitude	Power, Wealth, Skills, Knowledge, Rectitude	Skills, Knowledge, Rectitude	Knowledge, Skills, Rectitude
Scope values	Respect, Wealth	Wealth, Respect, Skills, Knowledge, Well-being	Respect, Affection	Respect, Wealth	Respect, Wealth, Knowledge	Respect, Knowledge
Strategies	Enforce national conservation laws and regulate research and rhinoceros management activities	Engage in contractual negotiations	Engage with Conservancies and individual households to apply Traditional Authorities Act	Manage guest hospitality and DRC's operations	Lead rhinoceros monitoring activities	Second a fully-funded conservation biologist to serve as SRT's Science Adviser
Outcomes	Oversight on concession area and rhinoceros management activities is provided. The head contract for Palmwag Tourism Concession Area is upheld.	Benefits to local communities are increased.	Land is equitably allocated to local constituency and disputes are peacefully resolved	Business is viable (profitable). Conservation is achieved. Jobs and skills training for local people are increased	Rhinoceros population performance is enhanced and secured through consistent, standardized monitoring.	Management-oriented, interdisciplinary research is designed and delivered and an open, effective policy process that enhances rhinoceros conservation is facilitated

Table 2
Decision process appraisal summary relative to standard criteria.

Decision function	Criteria	Strengths	Limitations	Lessons learned
Intelligence	Dependable, comprehensive, selective, creative, available	Sound, scientifically-based research that addressed speciifc, relevant problems. Findings were made fully available to all participants through Forum meetings	Low sample size across individual rhinoceros limited applications to general guidelines	Include as many participants as possible in all aspects of problem definition and defining alternatives (via inclusive applied research). Make sure all participants see conservation as a primary goal and specify targets for wildlife.
Promotion	Rational, integrative, comprehensive, effective	Multiple management alternatives were developed rationally with all participants integrated in debating benefits and costs.	SRT trackers were often sidelined due to a lesser command of English.	Establish an open policy arena (Forum) from the onset and ensure all participants are willing and able to fully engage
Prescription	Effective, rational, inclusive	Prescriptions were largely effective since the inclusive nature fostered through the DRC Forum helped establish common interest solutions with minimal dispute	Prescriptions did not include the senior management for the neighboring Conservancies which could have facilitated future expansion	Ensure prescriptions receive full support from both guides and trackers and can be adequately explained to tourists. Create and make available simple written descriptions of each prescription
Invocation	Timely, dependable, rational, nonprovocative, inclusive	Guides and trackers established their own internal enforcement system based on respect and shared power that was timely, dependable, rational and nonprovocative.	New guides were often not comprehensively trained in to all the policies and procedures and took some time to adjust to the conservative approach.	Provide both guides and trackers with appropriate tools to help explain policies to tourists which in turn drives a self-regulatory system
Application	Open, inclusive, rational uniform	Application involved support from all participants, did not favor any special interest, effectively reduced disturbance without harming tourist experience, and succeeded in fostering a sense of collaboration and teamwork among WS and SRT staff	Lack of English proficiency limited some SRT trackers' willingness to engage with tourists	Identify and employ camp managers that are fair but firm. Management that is too coercive and controlling or too lenient creates a culture of limited-compliance.
Termination	Timely, dependable, comprehensive, ameliorative	Harmful ad hoc management practices were quickly terminated following application of new policies. The termination appeared to be dependable (lasting) and comprehensive with minimal dispute,	Some WS guides continued to conduct ad hoc rhinoceros tracking on their own in hopes for larger tips	Spend extra time explaining why certain practices were harmful and why shifting towards new practices will make their job easier and more rewarding (i.e. greater tips and praise from tourists, respect from peers, etc.), especially with new staff
Appraisal	Comprehensive, selective, independent, continuous	Comprehensively assessed both ecological (rhinoceros-related) impacts, tourist satisfaction and business viability. Adjusted policy based on evaluation.	Not fully independent and could be conducted more regularly.	Extend invitations for external appraisals at least once every couple years while completing internal evaluations at least once per year. Ensure that measures are comprehensive and include social indicators (i.e. tourist satisfaction, revenue, policy process) as well as ecological.

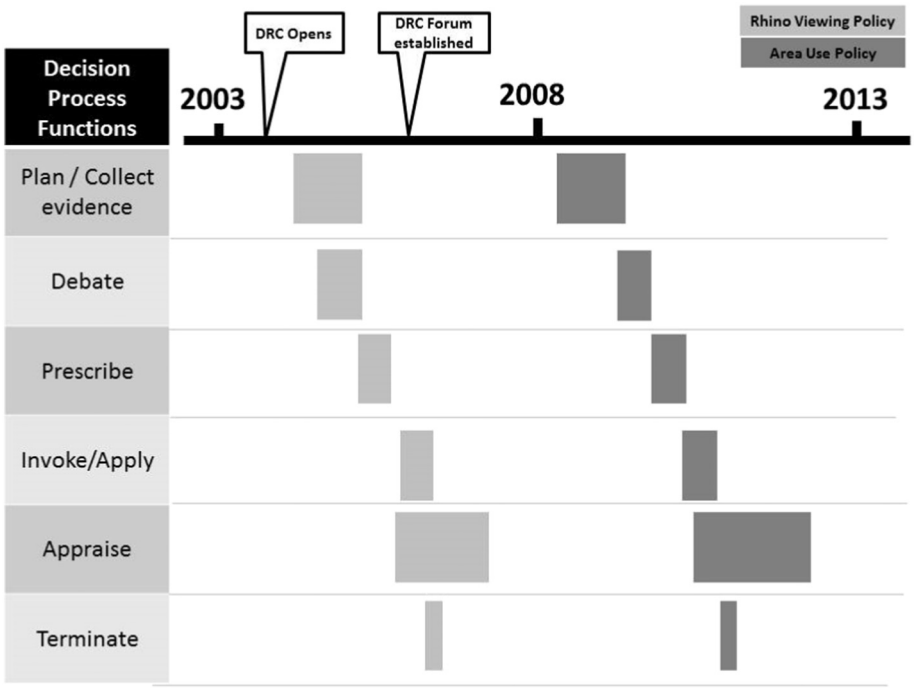

Fig. 3. Timeline describing the Rhino Viewing Policy and DRC Area Use Policy decision processes.

Forum also served to facilitate an emphasis on diplomatic or ideological strategies to solve disagreements regarding how intelligence was accumulated, interpreted and disseminated which resulted in joint decisions or compromises that both sides were motivated to implement. This is noteworthy, as evidence suggests conservation tourism partnerships are often marred by emphasis on economic (e.g., bribes) or coercive (e.g., public defamation or threats and accusations) strategies employed by either business elites or conservation officials and produce outcomes that promote division and suspicion (Garen, 2000).

The forum identified that weaknesses in intelligence also existed, but most were identified and rectified over time. First, vague operational goals defined DRC during the early years but were later refined to reflect the more specific goal of providing guests with an experience that enables rhinoceros to be observed (monitored) in their natural environment completely unaware of human presence. The lack of clarity in the initial goal definition was reflected by the ad hoc nature of rhinoceros tracking activity that took place between 2003 and 2005. Many encounters resulted in rhinoceros displacement. Second, when WS guides and SRT trackers began reporting that some natural and commonly used water points began to be avoided by rhinoceros, both sides were concerned but uncertainty on how best to solve the problem persisted. Finally, both SRT and WS agreed to support research to inform how the areas around the water points were used and how to manage a rhinoceros encounter with guests (Muntifering et al., 2019) (Muntifering et al., 2018). Results from these studies helped reduce uncertainty and provided guidelines that fulfilled both SRT and WS's expectations and value alignments. Despite the lack of a clear goal at the onset, the management-oriented research made the intelligence fit-for-purpose, dependable, creative and available.

The *Promotion (Debate) Function* primarily involves discussing alternatives alongside the clarification of the participants' expectations and demands. In our case, debate occurred primarily through the DRC Forum with both SRT and WS promoting and debating how the rhinoceros tracking activity should be conducted. Managing rhinoceros-human encounters was a critical topic during early DRC Forum meetings. Some preferred the ad hoc approach claiming 'they didn't need instructions on how to approach rhinoceros' and 'they have been doing this for years', also arguing that the rhinoceros would likely run away and not charge the group in any case. This was countered with concerns about permanently displacing the rhinoceros or yielding more agitated and potentially aggressive behavior increasing the likelihood of an accident. On the other hand, it was also suggested that this temporary over-exploitation could lead to habituation and thereafter lower stress levels, as found with gorilla (Shutt et al., 2014). Alternative perspectives voiced concerns about the potential negative effects of habituation which may place species at higher risk of human-induced mortality, such as poaching (Geffroy, Samia, Bessa, & Blumstein, 2015). In the end, consensus was reached on a decision to establish rules to provide greater assurance of human safety and the welfare of rhinoceros. Further, we sought to preserve what we believed was a unique opportunity to provide a rhino tracking experience that provided an encounter with a free-ranging rhinoceros exhibiting behavior unaltered by human presence in an ancient landscape. Modeling outputs from earlier collaborative research provided a series of encounter guidelines that aimed to achieve acceptable disturbance levels (Muntifering et al., 2018) that both SRT and WS agreed upon.

Managing the use of the wider operational area was also a major concern based upon the intelligence that suggesting the current tourism activity was impacting the rhinoceros population. All partners accepted that the airstrip, lodge and a road network were

essential infrastructure to tourism. It was also agreed that regulating to reduce road-use extent and intensity would be achievable. SRT promoted research findings that demonstrated the negative impact that roads used daily was having upon rhinoceros distribution (Muntifering et al., 2019) which further supported this option. Since all the WS guides also partook in the research, there was little opposition or challenge to this interpretation of the results. Some WS guides argued the practical need to access large areas during their safaris due to the relatively sparse and unpredictable wildlife sightings. However, everyone agreed that DRC's trademark activity, being able to locate and safely approach a rhinoceros on foot on a daily basis, was in jeopardy. Thus, all were convinced that reduced vehicle activity would likely improve the sustainability of the rhinoceros encounters. A handful of options were diplomatically discussed including a rotational-use strategy that would require daily vehicle activity to be restricted to specific zones. The promotion function appeared to be rational, integrative and effective.

Policy-making

The *Prescription or Decision Function* is the setting of rules, guidelines, and policies for action. Our prescriptions at DRC followed extensive collective discussion and debate on research findings. The DRC Forum initiated two key prescriptions to improve the sustainability of the rhinoceros tracking activity. Firstly, a rhinoceros encounter protocol was jointly developed based on the research modeling outputs (Muntifering et al., 2018). Secondly, following the debate on vehicle impacts and reduced vehicle activity, both WS and SRT agreed that the operational area should be divided into four distinct activity zones and that no more than two zones per day would be traversed by vehicle and no zones would be used on a daily basis (Muntifering et al., 2019).

In order to help proactively mitigate possible reduction in guest experience, the DRC Forum also chose to prescribe additional enhancements to the messaging at DRC which was collaboratively written up as a ‘messaging manual’ available onsite for WS and SRT staff. Specifically, WS guides requested SRT trackers to help them provide an overview on the threats facing rhinoceros in Africa, the strategies employed to help protect them (including tourism), and an introduction to and justification for DRC's rhinoceros viewing policies to all the new guests on their first night around the campfire. It was also decided that SRT would be given a chance to present their monitoring work to the guests following the morning rhinoceros tracking activity at lunchtime. Based upon shared respect, power and rectitude for the rhinoceros' well-being, it was felt that these integrative activities would not only minimize rhinoceros disturbance but also enhance the overall rhino conservation experience for the guests. The prescription function was carried out using diplomatic and ideological strategies based upon both SRT and WS newly acquired knowledge and a shared respect and rectitude towards the rhinoceros.

Implementation and compliance

The *Invocation and Application Functions* is both the provisional and final characterization of instances in terms of the prescriptions and may collectively be considered the *Implementation*. In our case, the DRC rhinoceros viewing policy was implemented by displaying the evidence-based encounter guidelines on a ‘Rhino Viewing Card’ that became a tool for the guides and trackers to use during rhinoceros tracking activities as well as communicating the encounter policy with guests. The collectively-designed Rhino Viewing Cards also removed pressure typically placed upon guides by guests wanting to get excessively close to wild animals as it was a fully endorsed camp policy presented jointly by both WS and SRT a priori to rhinoceros tracking. Once the Rhino Viewing Cards were created, the DRC Forum mandated that it was the SRT trackers' role to regulate the rhinoceros encounters, specifically how close the group approached and how long they remained. This was justified since the SRT trackers were also held responsible for diverting a rhinoceros charge from the group and, as such, were much more likely to avoid dangerous situations. This established a collectively-authorized set of roles and responsibilities based on shared respect for both human and rhinoceros well-being. This also helped foster self-compliance with the encounter policy. In order to invoke the rotational use policy, the DRC Forum members collectively created a zonation scheme and mapped the boundaries for four activity zones with the DRC operational area. Despite being more complicated to enforce, SRT trackers were a check on WS guide vehicle activity by reporting any guide vehicle tracks that were detected the following day outside of the intended zone. SRT trackers were entitled to report the incident to the camp managers during the daily management meetings who would take disciplinary measures.

In order to make the application process more contextual, constructive and effective, the prescription for SRT trackers and WS guides to jointly present and justify the rhinoceros viewing policy during campfire briefings to guests was implemented. This also served to re-calibrate any preconceived expectations the guests may have developed through uninformed travel agents or outdated marketing material about the rhinoceros encounter. During these briefings, special emphasis was placed on explaining the unique features of the DRC rhinoceros (one of the last free-ranging rhinoceros populations), the highly justifiable rationale for keeping them wild (safer from poachers), and a reminder about the safety risks (rhinoceros are surprisingly fast and agile and there are few escape routes in the desert landscape to out-maneuver a charging rhinoceros) to gain understanding and appreciation from the guests.

The collectively created zonation maps, prominently displayed in DRC's main entertainment area, helped serve the dual purpose of providing an overview of the area to the guests during their arrival introduction and an opportunity to present and discuss the rotational area use policy. Following the tracking activity, WS guides would return to the map with their guests who explained where they traveled. This process served as an effective self-check on vehicle activity as the guide would have to explain why he/she chose or not chose to follow the camp's rotational use policy. Each evening the WS guide(s) scheduled for the next day's rhinoceros tracking and the lead SRT tracker would jointly discuss upon which zone the rhinoceros tracking activity would focus the following day. The application function's context within DRC's decision process can be characterized by multiple examples of power sharing, mutual respect, concern for human well-being, and rectitude for rhinoceros.

Lastly, the *Adaptation or Termination Function* is the discontinuance of previous prescriptions. We ended the previously accepted ad hoc viewing approach and area use, once the viewing and rotational use protocol were adopted. There were very little animosity or regression back to prior practices which was testament to the respectful, dependable and ameliorative process that established the shared decision-making context.

Evaluation

The *Appraisal or Monitoring Function* evaluates successes and failures with respect to the desired goals. We monitored our case's success and failures at multiple time steps, some formal and some less formal, to improve the sustainability of rhinoceros encounters at DRC. The appraisal function was primarily led by SRT. We recognize that ideally this should be conducted by a fully independent individual or group and should be considered in the future. However, a standard set of measures, promoted by the IUCN African Rhinoceros Specialist Group as key rhinoceros performance indicators (Emslie, Amin, & Kock, 2009), were used which would minimize subjectivity and inter-evaluator variability. The first informal appraisal took place in 2008, followed by a more formal evaluation in 2011. Formal analysis conducted in 2011 found rhinoceros monitoring occurring at DRC between 2006 and 2010 produced on average each month between 15 and 40 completed rhinoceros identification forms and associated photographs which encompassed between 75 and 95% of the known individual rhinoceros within the DRC operating area and comprised roughly 20% of the northwest subpopulation. There was no significant difference in breeding performance between rhinoceros under tourism pressure at DRC and other rhinoceros persisting in similar nearby habitat but not exposed to tourism nor any significant displacement of any rhinoceros in the DRC area into poor quality habitat or areas of greater poaching risk (Muntifering et al., 2011). Furthermore, within two years after the evidence-based viewing policy was enacted rhinoceros displacements decreased from 26% to 5.4% while maintaining high levels of tourist satisfaction (Muntifering et al., 2018). In terms of collaboration, the simple fact that the partnership has persisted for over 15 years including three formal contractual renewals between SRT and WS is testament to the collective buy-in to the process. Additionally, evidential support for the effectiveness of the decision-making model was demonstrated in the collaborative nature SRT and WS exhibited while reconciling differences on how best to use and develop the operational area (Muntifering et al., 2019).

Synthesis by pnuemonic

Our approach proved adequate to guide contextual understanding of the case's decision-making process and for lesson drawing. Our case illustrates how an inclusive and pragmatic effort helped improve rhinoceros conservation's relevance and efficiency (Linklater, 2003) within a multi-stakeholder tourism context. The lessons learned from this case-study are also applicable and might be implemented to resolve or avoid escalating other societal or community conflicts over wildlife utilization and management. Lastly, we offer a few elements transferable to other conservation tourism ventures. We term these prototypical elements the 'ACE' approach as a synthesis of our results and described below.

A = Arenas for Inclusive Policy Debate and Decision-making

In order to ensure that all participants' views are integrated and contribute towards establishing a common goal, an open and universally respected arena or forum to facilitate a shared, decision process is absolutely essential. The lack of such a fundamental structure often results in uninformed decisions driven by individual agendas dominated by special interests. An open arena fosters social learning and the building of genuine collaboration. Its implementation should bring together not only senior leaders and managers, but also junior tactical staff members who tend to be more intimately involved in program delivery. This 'team of teams' approach (Fussell, 2017) helps to optimize problem solving, and break conventional bureaucratic and other bottlenecks in decision-making. A single individual should be tasked with leading each meeting and held responsible. Open praise for exceptional work ethic and achievements should be strongly rewarded. Lastly, the frequency of meetings should be set at the pace of the operational need for decisions and action.

In practice, the DRC Forum played a vital role in establishing one of the most critical aspects of the actual rhinoceros viewing event; the communication between the guides and trackers. Roles were clearly demarcated by agreement and enforced, respected and translated into teamwork among stakeholders. The legitimacy of roles was attained by an open debate and decision-making process provided by a shared, fully inclusive policy arena.

C = Conservation-oriented Messaging Focus

Evidence suggests that wildlife tourism guides may be tempted to rule-break because of actual or potential guest tipping behavior (Sandbrook & Semple, 2006). This is predicated upon false expectations that are assumed by paying tourists or promoted by their agents, either intentionally (to sell the trip) or unintentionally (simply misinformation). However, our experience discussing this issue informally with hundreds of rhinoceros tracking tourists suggests that most tourists actually prefer *not* to get close to dangerous wildlife. Further, we found that those people who come with unrealistic expectations of getting up-close-and-personal can be convinced otherwise by providing sound, rational, and authentic justifications for being conservative. Building a common conservation-oriented message that is demonstrated throughout the entire experience both in and outside of the camp brings about a unifying narrative, a sense of direction, and mission messaged by the entire staff and the tourists they host. We therefore recommend a staged and strategic messaging approach to improve compliance with conservation without compromising the tourist experience. Reaching an agreed and foundational narrative is critical to dissolving the potential for conflict and uniting stakeholders and their consistent relationships with third parties.

In practice, we emphasize a pre-activity briefing that contains three key messages. In a quiet setting (we chose the campfire), the

tourists are introduced to the unique features of Namibia's desert black rhinoceros, threats the species is facing from poaching and animal behavioral sensitivities to humans that render them susceptible to human-induced harm (i.e., how habituation could lead to increased vulnerability to poaching). Next, the guides and trackers emphasized their role as local stewards and state their goal to minimize disturbance and safety risks, while ensuring a unique wilderness experience that benefits conservation. Lastly, the camp's wildlife viewing policy is carefully articulated, noting its scientific basis and making reference to scientific articles. The over-arching goal is to ensure that guests realize that this experience is well beyond just 'seeing an animal' and more about contributing towards its long-term conservation through community engagement and empowerment (Muntifering, 2019). We have found few people broke the rules based on more than a decade with high-paying, well-traveled conservation-minded tourists which is further supported by the significant rhinoceros displacement frequencies recorded (Muntifering et al., 2018). Furthermore, when guides and trackers recite policy and specific rules to tourists, they themselves concluded that they felt more accountable.

Depending upon the length of the viewing activity, other opportunities may exist to provide conservation messages that enhance both the tourism experience and conservation outcomes. For example, we encouraged the trackers to provide a short (10–15 min) overview of their work to the guests at picnic lunch stops that often included sharing their intimate knowledge of each rhinoceros and specific information on their commitment to protect them (e.g., something as simple as showing long-term sighting charts). This not only excited the guests but also likely increased the morale (respect) of the trackers, who would often receive significant positive feedback from the guests for *their* work. We aim to further explore this interesting relationship in the future. As well, we often have a staff member from the local community openly and formally thank all the guests for supporting *their* efforts to protect *their* rhinos by choosing to visit DRC just before dinner. Again this reinforced the emphasis on creating a common purpose and local ownership in the experience.

E = Evidence-based Management Framework

Conservation often suffers from a misalignment between research and management (Linklater, 2003) wherein research often does not address relevant questions to management. As well, research findings may be inaccessible or unknown to management or are simply poorly communicated (Pierce et al., 2005; Thirgood, Mduma, Keyyu, & Karen Laurenson, 2007). In conservation tourism, establishing an evidence-based management framework (Stewart, Coles, & Pullin, 2005; Sutherland, Pullin, Dolman, & Knight, 2004) is useful for a number of reasons. First, initiating the DRC forum enabled and empowered both tourism and conservation staff to directly participate in defining problems and prioritizing research questions including both management and the actual staff responsible for service delivery (in our case, guides and trackers). This critical, inclusive step ensured that our research was always relevant and timely.

In practice, from the onset at DRC, our biggest operational challenge was ensuring consistent data on rhinoceros sightings. To do so was important for both tourism and monitoring objectives. Thus, our research focused on reducing disturbance to help sustain frequent and reliable sightings in the near and long-term. We also required researchers to provide and receive regular reliable feedback on research findings during DRC forum meetings. We stipulated that all research results and recommendations must be described to be easily understood by all participants. This reliable information and its communication helped ensure that information was accessible and communicated adequately, timely, and consistently.

Conclusion

As human-induced threats to wildlife intensifies, specifically illegal trade in wildlife and associated increases in poaching rates for high-value species like rhinoceros (Duffy, Emslie, & Knight, 2013), tourism – when designed and delivered effectively – may improve the value local people attach to saving species such as rhinoceros (Muntifering, 2019). Our investigation focused on improving the efficacy of rhinoceros conservation tourism and managing for constructive relationships between, and contributions of, the diversity of stakeholders. Prototyping revealed problems that we addressed as we went. As such, our case served a learning function and our lessons are transferable to other wildlife-based tourism operations, especially when managed as a partnership. Our case-study is more widely applicable wherever wildlife utilization and co-management occurs along with disagreement and conflict among stakeholders with different values. The importance of understanding and integrating the local social context and participants, creating a sound, flexible social process, and carrying out real time learning from a systematic understanding of the decision process in play are all key elements to the success of our program. We believe our ACE framework offers pragmatic guidelines to enhance the effectiveness of tourism as a conservation tool. Wherever conflict over wildlife occurs, creating a respectful arena for debate, decision-making, and agreeing on narratives that are informed by evidence-based research and management can provide the basis for success.

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Declaration of competing interest

None

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.annals.2020.102918.

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