

THE IMPACT OF RHINO POACHING ON THE ACCOUNTABILITY DISCLOSURES OF A STATE-FUNDED CONSERVATION ORGANISATION

Barry Ackers (*University of South Africa*)¹

Abstract:

The unprecedented growth in the illegal wildlife trade has created a serious challenge for conservation in Africa. Governments around the world often create entities to protect species and preserve biodiversity in their respective countries. Despite numerous interventions to conserve the world's threatened rhino populations and reduce incidents of rhino poaching, poaching of the world's rhino populations continue, especially in South Africa. Descriptive and inferential statistics are used to analyze and compare rhino-related disclosures with rhino poaching trends, to identify possible correlations between incidents of rhino poaching and rhino-related, and to establish differences between the periods between 2006 to 2015 (covered in Ackers, 2019) and the subsequent period from 2016 to 2021. Unlike the period from 2006 to 2015 where several rhino-related keywords were strongly correlated with rhino poaching incidents, no correlations were detected from 2016 to 2021. Although incidents of rhino poaching decreased, SANParks appear to have strategically increased its anti-poaching advocacy by retaining high levels of disclosures about rhino-related issues, demonstrating how it has discharged its biodiversity-related mandate. Using the same mixed-methods research approach and similar data, this paper extends the Ackers (2019) study, which examined how South African National Parks (SANParks), by including the disclosures from 2016 to 2021.

Keywords: *accountability; biodiversity; conservation; extinction accounting; rhino poaching; SANParks*

JEL CLASSIFICATION: Q01, Q3

EL IMPACTO DE LA CAZA FURTIVA DE RINOCERONTES EN LA RENDICIÓN DE CUENTAS DE UNA ORGANIZACIÓN DE CONSERVACIÓN FINANCIADA POR EL ESTADO

Resumen:

El crecimiento sin precedentes del comercio ilegal de especies silvestres ha creado un grave problema para la conservación en África. Los gobiernos de todo el mundo suelen crear entidades para proteger las especies y preservar la biodiversidad en sus respectivos países. A pesar de las numerosas intervenciones para conservar las poblaciones de rinocerontes amenazadas del mundo y reducir los incidentes de caza furtiva de rinocerontes, la caza furtiva de las poblaciones de rinocerontes del mundo continúa, especialmente en

¹ Department of Auditing, College of Accounting Sciences, University of South Africa, ackerb@unisa.ac.za, <https://orcid.org/0000-0002-5981-7889>

Sudáfrica. Se utilizaron estadísticas descriptivas e inferenciales para analizar y comparar las divulgaciones relacionadas con rinocerontes con las tendencias de la caza furtiva de rinocerontes, para identificar posibles correlaciones entre incidentes de caza furtiva de rinocerontes y relacionados con rinocerontes, y para establecer diferencias entre los períodos entre 2006 y 2015 (cubiertos en Ackers, 2019) y el período posterior de 2016 a 2021. A diferencia del período de 2006 a 2015, en el que varias palabras clave relacionadas con el rinoceronte estaban fuertemente correlacionadas con los incidentes de caza furtiva de rinocerontes, no se detectaron correlaciones de 2016 a 2021. Aunque los incidentes de caza furtiva de rinocerontes disminuyeron, SANParks parece haber aumentado estratégicamente su defensa contra la caza furtiva manteniendo altos niveles de divulgación sobre cuestiones relacionadas con los rinocerontes, lo que demuestra cómo ha cumplido su mandato relacionado con la biodiversidad. Utilizando el mismo enfoque de investigación de métodos mixtos y datos similares, este documento amplía el estudio de Ackers (2019), que examinó cómo los funcionan los South African National Parks (SANParks), al incluir las divulgaciones de 2016 a 2021.

Palabras clave: *responsabilidad; biodiversidad; conservación; contabilidad de extinción; caza furtiva de rinocerontes; SANParques*

1. Introduction

The illicit global wildlife trade is estimated at more than USD72 billion per annum (Moneron, Brock & Newton, 2020). This has resulted in nearly 10,000 rhinos being poached over the past decade, decimating the global rhino population to less than 30,000, from more than 500,000 at the beginning of the 20th century (Dang & Nielsen, 2022a), pushing rhinos to the brink of extinction (Dang & Nielsen, 2022b). Despite numerous interventions to curb rhino poaching, the decimation of the world's rhino population continues (Ferreira, Greaver, Knight, Knight, Smit, & Pienaar, 2015).

Accounting should be about more than simply accumulating data and preparing annual financial statements (Atkins, Maroun, Atkins, & Barone, 2018). Organizations continue to respond to societal expectations for them to account to the public about the impacts of their operations on society, the economy and the environment (Ackers, 2019), especially by organizations owned, operated and/or funded by the state, where public resources are used to fulfil their mandates on behalf of the state (Ackers & Adebayo, 2022). These organs of the state should comply with their respective government's environmental commitments, such as the recent Conference of Parties in Egypt (COP27) of the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations 2030 Agenda for Sustainable Development (SDGs) (Ackers & Adebayo, 2022; UNEP, 2021). SDG 15 (Life on Land) is particularly relevant to rhino conservation.

Rhino poaching has been extensively researched, primarily in relation to conservation in the natural sciences (Thakholi, 2021; Lunstrum, 2018). This paper, situated in the emerging field of accounting for biodiversity, builds on Ackers (2019) exploring how South African National Parks (SANParks), the custodian of the world's largest rhino populations of rhinos in the wild accounts to the public about their performance relating to rhino poaching in the game reserves under its control. Examining rhino poaching data for the period 2006 to 2015, Ackers (2019) found that SANParks appeared to comprehensively disclose pertinent information about its anti-poaching interventions and how it discharged its rhino-related biodiversity mandate. The increased disclosure of rhino-related issues in the SANParks annual reports for the corresponding period, appeared to be strongly positively correlated to the increase in incidents of rhino poaching, with a one-year lag (Ackers, 2019). Expecting incidents of rhino poaching to continue, involved (Ackers, 2019) proposes that relevant parties, including private and public sector organizations, non-governmental (NGOs) and non-profit organizations (NPOs), as well as private citizens around the world adopt a multi-pronged, interdisciplinary and collaborative strategy to "save the rhino".

The importance of interventions to halt rhino poaching and preserve the world's remaining rhino populations, and since the Ackers (2019) data was now more than six years old, prompted a need to see how much had changed. Pertinent disclosures in SANParks annual reports were examined, to understand whether the rhino poaching statistics had changed, and how SANParks accounted for the impact of their anti-poaching interventions. The study deploys an interpretive mixed methods research approach to explore and analyze pertinent rhino-related information to understand SANParks' biodiversity performance, especially relating to South Africa's threatened rhino populations.

Acknowledging that the emerging field of extinction accounting, as well as accounting for rhino poaching and conservation issues, typically fall outside what may be considered the conventional domain of accounting, after the introduction, the applicable theories underpinning the paper are described, the rhino poaching problem is contextualized, and SANParks is briefly introduced. Thereafter, the methodology is described before the study observations relating to rhino poaching and conservation are discussed, analyzed and interpreted, before concluding.

2. Literature review

The rise into biodiversity research by accounting scholars follows two distinct approaches (Cuckston, 2018). The first considers biodiversity reporting as an extension of social and environmental accounting, whereas the second examines biodiversity reporting in terms of accounting for conservation efforts.

The illicit and unsustainable trade in wildlife and wildlife products threatens many species (Thomas-Walters et al., 2020). Thomas-Walters et al. (2020, p.487) provide useful insights into what drives the illicit wildlife trade, including (1) Experiential (recreational or sensory); (2) Social (reputational, influencing or relational); (3) Functional (nutritional, medicinal, fuel, housing and crafts, or labor); (4) Financial (financial gain); (5) Spiritual (spiritual well-being, religious, or ritualistic). However, despite these discrete categories, wildlife products could be used for multiple purposes, driven by multiple motivations. Rhino poaching appears linked to (i) social – as a symbol of wealth and to cement business and political relations; (ii) functional – for its dubious health properties as well as enabling those lower down the poaching chain, to feed their families; and (iii) opportunistic financial gain by those higher up in the supply chain (Dang & Nielsen, 2020b; Hübschle, 2017).

2.1 Theoretical underpinning

A multi-theoretical (Fernando & Lawrence, 2014) and not a single theoretical research approach is applied to understand and contextualize the intricate interrelationships among governments, public sector entities and society. Since SANParks is mandated by the state to protect species and preserve South Africa's biodiversity, the applicable theories include a combination of shareholder primacy and stakeholder theories, as well as their respective component theories. These theories are integrated and simultaneously applied, providing the theoretical foundation for this paper.

Shareholder primacy holds that organizations should strive to maximize value for their owners (Styhre, 2018). Being owned by the state and utilizing public funds (Walther, 2015), obliges SANParks to not only account to the state, but also to the public. Since the public are the “real owners”, as well as beneficiaries of public goods and services provided by public sector entities, requires them to account for their performance using the public resources they use to discharge their designated mandates, on behalf of the state. The principals of public sector entities therefore include both the state and the taxpaying public. Agency theory refers to the separation of ownership and control between the principals (owners) and agents (managers) of organizations (Jensen & Meckling, 1976). This results in information asymmetry, whereby agents know more about the organization than principals (Kilic & Kuzey, 2018). Principals should therefore closely monitor the activities and performance of agents (Hussain, Rigoni, & Orij, 2018), reducing the risk of opportunistic agent behavior and conflicts of interests. Accountability theory requires agents to account to their principals about their performance (Ștefănescu, Opreșor, & Sintejudanu, 2016).

Stakeholder theory on the other hand, requires organizations to accommodate the reasonable expectations of various parties legitimately interested in their performance (Ferrero-Ferrero, Fernández-Izquierdo, Muñoz-Torres, & Bellés-Colomer, 2018). Stakeholders include any party affected by, or capable of, affecting an organization's ability to achieve its objectives (Freeman & McVea, 2001). Accountability theory not only requires organizations to account to their owners, but also to legitimate stakeholders. Institutional theory holds that organizations achieve legitimacy when they are perceived as responsive to normative societal expectations about their operational impacts on the economy, society and the environment (Ferrero-Ferrero et al., 2018). However, instrumental theory suggests that some organizations may only accommodate normative stakeholder expectations to the extent that it is in their own interest to do so, thereby legitimising their operations (Jones, Harrison & Felps, 2018; Balakrishnan, Malhotra, & Falkenberg, 2017).

A multi-theoretical approach is used to describe the conflicting relationships between organizational managers (as agents) and stakeholders (both as owners and affected parties) (Hussain et al., 2018). Adopting a wider theoretical lens to position public sector accountability within shareholder primacy and stakeholder

theories, and their associated sub-theories, agency and signaling theories are components of shareholder primacy, and institutional, instrumental and legitimacy theories relate to stakeholder theory, with accountability theory applying to both.

2.2 The rhino problem

As reflected in Table 1, South Africa was home to an estimated 15,024 (64.1%) (2015 - 20,306, i.e. 79.2%) of Africa's total rhino population of 23,432 (2015 - 25,628), consisting of 12,968 white rhinos (81.3%) (2015 - 18,413, i.e. 90.4%) and 2,056 black rhinos (33.2%) (2015 - 1,893, i.e. 36.1%) (Ackers, 2019; CoP19, 2022). Aside from the 26% decline in the total number of rhinos in South Africa between 2015 and 2021, it is significant that South Africa's proportion of Africa's rhinos also declined by 15.1%, resulting in three important observations. First, the extent and impact of rhino poaching in South Africa is more extensive than in other African countries. Second, after allowing for the lower number of black rhinos, the poaching of white rhinos is disproportionately higher, with black rhino populations actually increasing over the respective periods. Ignoring the constraints associated with vegetation density, habitat accessibility and anti-poaching interventions, these observations are attributed to: (i) the mean mass of a set of white rhino horns being more than double that of a set of black rhino horns (Pienaar, Hall-Martin, & Hitchins 1991), poaching white rhinos is likely to yield heavier horns and accordingly more money; and (ii), most white rhinos being located in South Africa, makes South Africa a more lucrative source market for rhino poachers.

Table 1: African rhino population and poached African rhinos – 2015 and 2021 (CoP19, 2022; Ackers, 2019)

	White rhinos		Black rhinos		Total rhinos		Poached rhinos		Rhinos poached as % of total population	
	2015	2021	2015	2021	2015	2021	2015	2021	2015	2021
South Africa	18,413	12,968	1,893	2,056	20,306	15,024	1,175	451	5.8%	3.0%
Other African countries	1,965	2,974	3,357	4,139	5,322	7,113	174	50	3.3%	0.7%
Total	20,378	15,942	5,250	6,195	25,628	22,137	1,349	501	5.3%	2.3%

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement to ensure that the international trade in wild animals and plants does not threaten species survival. The CITES listing of all rhinos in 1977, means that all international commercial trade in rhino products, are subject to the Congress of the Parties (CoP), prompting most countries to ban, or restrict trade in rhino horn trade and use (Milledge, 2005). The International Union for the Conservation of Nature (IUCN) classifies black and white rhinos as being critically endangered and near threatened, respectively (Chanyandura, Muposhi, Gandiwa & Muboko, 2021). In South Africa, black and white rhinos are managed by the National Environmental Management: Biodiversity Act, Act 10 of 2004 and its subsequent Threatened or Protected Species Regulations, as well as the National CITES Regulations promulgated by the South African government (CoP15, 2010). The UNODC (2020) estimate that 86% of rhino poaching was in South Africa.

Despite focusing on the rhino poaching problem in South Africa, and SANParks in particular, it is necessary to understand the rhino poaching problem within a broader African context (Ackers, 2019). Table 2 reveals that 451 (90%) of the 501 African rhinos poached in 2021 (2015 - 1,342) were in South Africa (2015 - 1,175, i.e. 87.6%), with the remaining 50 (10%) across the rest of Africa (2015 - 167, i.e. 12.4%), disproportionately representing 3.9% (2015 - 5.8%) of South Africa's rhino population and only 0.7% (2015 - 3.1%) of rhinos in the rest of Africa (CoP19, 2022; Ackers, 2019). Similarly, the impact of rhino poaching in South Africa is illustrated by 90% of the 2,707 Africa rhino poaching from 2018 to 2021, occurring in South Africa (CoP19, 2022). The severe restrictions on movement implemented during the COVID-19 lockdown in South Africa, reduced incidents of rhino poaching in the KNP during 2020 by almost 80% (CoP19, 2022). Most of the estimated 4,593 to 5,186 horns destined to enter the illegal trade during the period 2018 to 2020, were from poached rhinos (CoP19, 2022). Of these, 2,418 to 2,869 (53% - 55%) were recovered through law enforcement activities, with most recovered at places other than where

the rhinoceroses were poached. It would appear that the collective efforts of the various role-players, including stricter law enforcement to address the rhino poaching problem together with the COVID-19 restrictions, have contributed to reducing rhino poaching in South Africa.

Table 2: Poached African rhinos from 2005 to 2021 (CoP19, 2022)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
South Africa	36	13	83	122	333	448	668	1,004	1,215	1,175	1,054	1,028	769	594	394	451
Rest of Africa	24	49	179	79	93	84	83	119	109	174	113	97	161	179	109	50
African total	60	62	262	201	426	532	751	1,123	1,324	1,349	1,167	1,125	930	773	503	501
% of African rhinos poached in South Africa	60%	21%	32%	61%	78%	84%	89%	89%	92%	87%	90%	91%	83%	77%	78%	90%

Table 3: African rhinos poached per day from 2005 to 2021 (adapted from CoP19, 2022)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
South Africa	0,10	0,04	0,23	0,33	0,91	1,23	1,83	2,75	3,33	3,22	2,89	2,82	2,11	1,63	1,08	1,24
Rest of Africa	0,07	0,13	0,49	0,22	0,25	0,23	0,23	0,33	0,30	0,48	0,31	0,27	0,44	0,49	0,30	0,14
African total	0,16	0,17	0,72	0,55	1,17	1,46	2,06	3,08	3,63	3,70	3,20	3,08	2,55	2,12	1,38	1,37

The illicit trade in rhino horn is undoubtedly highly lucrative, with rhino horn prices in end-user destination markets estimated at as much as USD400,000 p/kg for Asian and USD20,000 p/kg for African horns (Dang & Nielsen, 2022a). The price of rhino horn is subject to prevailing market forces, rising from only USD1 per kg in the 1800s, to USD100 by the 1970s, USD1,000 by the 1980s, and more recently, between USD35,000 and USD60,000 p/kg (Eloff & Lemieux, 2014). The UNODC (2020, p.118) however, found that the average price of raw rhino horn was around USD24,300 p/kg. The huge variance between the prices of Asian and African rhino horns is attributed to Asian horns being perceived as more powerful and more effective than African horns (Eloff & Lemieux, 2014). By comparison, the Wildlife Justice Commission (2022, p.130) found that the average value of a set of rhino horns in the South African source market was only USD7,529 per kg. Moneron, Okes and Rademeyer (2017) estimate that at least 13,322 rhino horns, weighing approximately 37 tonnes, poached from 6,661 rhinos entered the illicit wildlife trade between 2010 and 2016. To contextualize, Pienaar et al. (1991, pp.99-100) found that the mean mass of a set of white and black rhino horns were 5.88 kgs and 2.65 kgs, respectively. Using the South African source market price of USD7,529, or even the highest price of USD224,360 p/kg, banded around during the initial rhino poaching media frenzy (Ackers, 2019), the value of a set of horns is estimated between USD44,271 and USD1,319,237, depending on where the horn was located in the illicit rhino horn supply chain.

Moneron et al. (2020) found disparate “compensation” by the various role-players in the rhino poaching chain, with inexperienced poachers being offered between USD1,637 and USD3,508 for their efforts, while others earned between USD3,625 and USD7,251, compared with the intermediary or “poaching boss” receiving between USD4,736 and USD7,894 p/kg. Despite the disparity in price between source and consumer markets, the payment that poachers could receive for the horns of one rhino is significantly more than the annual income that most rural dwellers would earn through legitimate means (Hübschle, 2016).

The scale of the rhino problem is illustrated by the UNODC (2020, p.115) estimating that 5.2 tons of African rhino horns enter the illicit rhino horn trade each year, 4.6 tons of which reach end users in Asia. The Wildlife Justice Commission (2022) estimates that gross revenue from the wholesale trade in raw rhino horn from 2012 to 2021 varied between USD874 million and USD1.13 billion. Whereas the UNODC (2020, p.116) estimates that rhino horn generated annual revenue between USD170 million and USD280 million between 2016 and 2018, the cumulative amount received by poachers was only between USD6 million and USD43 million.

The high demand for rhino horn products in Asian consumer markets, has resulted in comparatively high prices for rhino horn, attracting a plethora of new suppliers of illicit rhino horn, including poachers, organized crime and various criminal elements within the broader wildlife industry as well as in conservation circles (Hübschle, 2017). The value of the illegal trade in rhino products, means that the stakes and consequences have never been higher. Rhino poachers consider the risk of “getting caught” or even killed, as an operational risk, far outweighed by the anticipated financial gains (Hübschle, 2016).

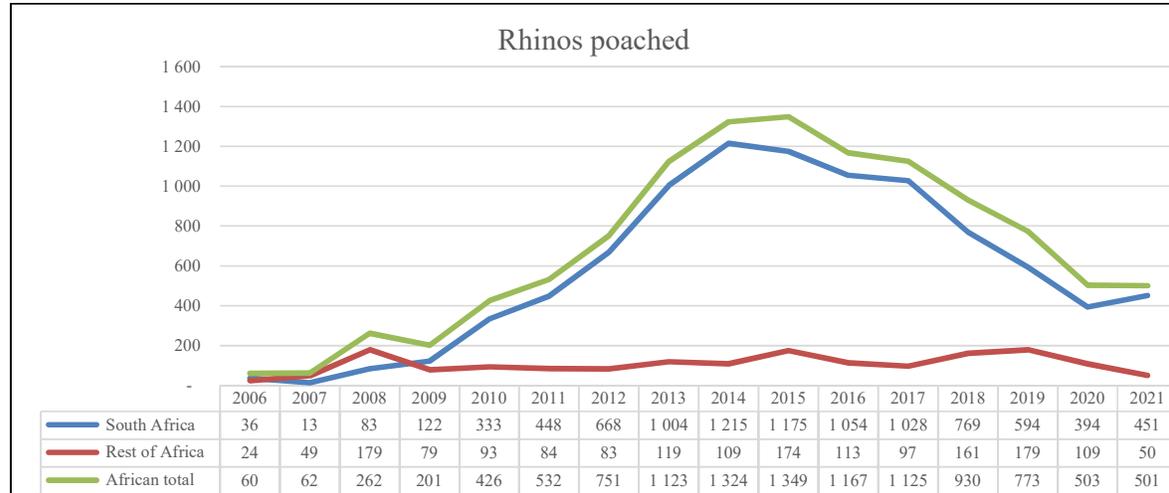
While proponents of rhino farming argue that horns sustainably harvested from live rhinos should be legally sold to meet the international demand for rhino horn products, resolving the rhino poaching problem (Dang & Nielsen, 2022a), this would require lifting of the CITES ban. However, Dang, Nielsen and Jacobsen (2022) found that Vietnamese consumers of rhino horn products do not want captive-bred rhinos, preferring and willing to pay more for horns sourced from rhinos living in wild or semi-wild environments, believing that wild rhino horns have better medicinal efficacy. Aside from the moral and ethical implications of commercially farming wild animals, introducing legally obtained rhino horns may simply become a channel for the illicitly obtained rhino horns to infiltrate the consumer market.

2.3 *Drivers of rhino poaching*

Although the exponential increase in rhino poaching (Ackers, 2019) may imply that rhino poaching is a relatively new phenomenon, it is a long-standing problem. For example, colonization of Africa, witnessed many large species, such as rhino, hunted to the brink of extinction (South Africa, 2013). Similarly, during South Africa’s war against democracy, General Magnus Malan (the Minister of Defense at the time) sanctioned involvement by South African Military Intelligence in illicitly smuggling ivory and rhino horn, as an integral part of their regional destabilization strategy to perpetuate South Africa’s apartheid regime (Büscher & Ramutsindela, 2016; Ellis, 1994).

It is interesting to reflect on how the perpetrators have changed from colonial, and more recently, wealthy trophy hunters, to poachers from communities adjacent to the parks and reserves containing rhinos. These subsistence poachers tend to hunt rhinos to meet the increasing demand for rhino horn products in Asian markets, where wealthy Vietnamese and Chinese individuals are the main end-users (Dang & Nielsen, 2022b). Given the lack of employment opportunities in rural communities, including in neighboring countries, such as Mozambique and Zimbabwe, these subsistence poachers risk their lives to poach in order to provide for their families (Hübschle, 2017; Lunstrum & Givá, 2020). Therefore, interventions to protect the lives of rhinos, without sufficient employment and entrepreneurial opportunities to impoverished communities, could be perceived as implying that rhino lives are more valuable than black lives (Thakholi, 2021). A further colonial legacy, still prevalent in South Africa today, highlights deep-rooted racial inequity. To create pristine wilderness and conservation areas, South Africa’s “white” apartheid government was directly responsible for forcibly removing many indigenous African communities from their traditional lands (Büscher, 2016). Additionally, today’s wildlife-based tourism industry still tends to be heavily skewed towards serving white people (Büscher, 2016). Individuals employed by game reserves perceive their remuneration as insufficient and characterised by poor employment conditions, including unpaid overtime, sub-par accommodation, workplace racism and lack of prospects, giving rise to comments such as “the best promotion I can get from this position is to become a poacher” (Thakholi, 2021, p.713).

Figure 1: Growth in incidents of rhino poaching in South Africa from 2006 to 2015



Despite having no intrinsic medicinal properties, rhino horn continues to be coveted in East Asian markets, ostensibly as an ingredient in traditional medicines, to be used as an aphrodisiac (Atkins et al., 2018), health tonic, to reduce hangovers, detoxify the body and reduce high fever (Dang & Nielsen, 2022a). The medicinal efficacy of rhino horn products appears to be deeply rooted in a combination of ancient traditional beliefs and modern urban myth (Moneron et al., 2017) and considered a status symbol by wealthy consumers in Asian markets, who display their affluence through conspicuous consumption of luxury goods, such as rhino horn (Dang & Nielsen, 2022b; Hübschle, 2017). Rhino horn is also used as an investment instrument, criminal currency, a gift to cement business relations (Hübschle, 2017) and supplied to the art and antiques market in China (Dang & Nielsen, 2022a; Moneron et al., 2017).

2.4 South African National Parks (SANParks)

SANParks is a public entity, established in terms of the National Environmental Management: Protected Areas Act 57 of 2003 to conserve, protect, control and manage national parks and other defined protected areas and their biodiversity (South Africa, 2003). SANParks is subject to the prescripts of the Public Finance Management Act (South Africa, 1999), its associated Treasury Regulations (South Africa, 2005), as well as the Protocol on corporate governance in the public sector (South Africa, 2002). The regulatory framework applicable to SANParks, requires it to disclose its performance against predetermined objectives, in the annual report.

SANParks operates and manages 21 national parks throughout South Africa (SANParks, 2015), comprising more than four million hectares, or 3% of South Africa’s total land area (Novellie, Biggs, & Roux, 2016, p.4), is South Africa’s leading conservation agency, mandated to sustainably conserve biodiversity and maintain heritage assets, for the benefit of broader society (Foxcroft, Van Wilgen, Baard, & Cole, 2017), and for future generations (Ackers, 2019). SANParks, and to the KNP in particular, are home to both black and white rhinos (Ferreira et al., 2017). The KNP is home to 49% of all rhinos in South Africa (Nhleko, Ahrens, Ferreira, & McCleery, 2022), and custodians of the world’s largest population of rhinos in the wild (Emslie, Milliken, Talukdar, Ellis, Adcock, & Knight, 2016), making it the primary target of rhino poachers (Büscher & Ramutsindela, 2016), and the global epicenter for the illicit poaching of rhinos (Lunstrum & Givá, 2020). It is pertinent to note that white rhinos went extinct in the KNP in 1896 before reintroduction in the 1960’s, while there were only 110 black rhinos left in all South Africa’s game reserves in the 1930s (South Africa, 2013).

2.5 Anti-poaching interventions

The South African Department of Environmental Affairs integrated approach to curbing rhino poaching and sustaining rhino conservation efforts (South Africa, 2015) covers four aspects. First, extensive anti-poaching programs and effective zone management using technology and intelligence. Second, disrupting organized crime and more equitably sharing ecosystem services. Third, developing a legal and sustainable rhino trade system. Fourth, biological management interventions such as strategically removing rhinos from

high risk poaching areas. Collectively, these actions are expected reduce the demand for illegal rhino horn, while providing alternative economies in marginalized communities where poaching originate, thereby reducing the threat of poaching. Ferreira et al. (2017) proposes that rhino conservation efforts should include interventions to maximize species protection, restore ecosystem processes, maximise population growth, induce meta-population dynamics and maintain genetic integrity. Ferreira et al. (2015) argues that integrated rhino conservation should include: (1) strategically moving rhinos from areas heavily targeted by poachers, to areas of lower risk, thereby reducing mortality rates, while focusing management actions over smaller geographical areas; (2) biological management, such as improving habitats (for example, through directed management actions, establishing new rhino colonies and intensely protected rhino sanctuaries), stimulating population growth rates; (3) effective paramilitary anti-poaching units; and (4) other actions which could include disrupting international criminal networks, establishing legal and extradition agreements between countries targeted by poachers and those harbouring poachers and horn dealers.

Using military and paramilitary role-players, techniques, technologies and partnerships to achieve conservation objectives is referred to as “rhino wars” (Borchert, 2022), “war on poaching” (Büscher & Ramutsindela, 2016), “green militarization” (Lunstrum, 2014), “green violence” (Büscher & Ramutsindela, 2016), or “green wars” (Büscher & Fletcher, 2018). However, the more sophisticated the paramilitary interventions, the more sophisticated the response of poachers, including the use superior weaponry, “ramping up the arms race” (Massé & Lunstrum, 2016). In addition to accepting the risk of being caught, poaching syndicates are resilient, adaptive and adept at exploiting law enforcement weaknesses and legal loopholes to smuggle rhino horn across multiple countries and legal jurisdictions. As enforcement efforts intensify, the smuggling routes and methods become increasingly diversified and complex (Moneron et al., 2017).

Governments, civil society and private sector role-players have intervened to curb this poaching crisis, and avoiding possible rhino extinction. In addition to deploying paramilitary anti-poaching teams, other attempted rhino conservation efforts include legalizing the domestic trade in rhino horn, dehorning rhinos, educating local communities about nature conservation, and relocating rhino from South Africa to Botswana (Koot, 2021; Thakholi, 2021). However, although paramilitary anti-poaching efforts may slow the wave of poaching, it is not believed to be enough to address the fundamental problems, and could alienate conservation bodies from the neighboring communities in which they operate. Similarly, the effectiveness of dehorning rhinos, a practice which emerged in South Africa in 2009/2010, is uncertain, especially since (Minaar & Herbig, 2018) note that: (1) horn stumps which could still weigh between half to one kg, are still sufficiently valuable for the rhino to be killed; (2) poachers may vindictively kill dehorned rhinos to prevent them futilely tracking rhinos without horns; (3) wildlife tourists feel cheated when they view rhinos that do not have horns; and (4) dehorning in 2011 was estimated to cost up to USD1,000 per horn.

3. Methodology

The research methodology may best be described as a pragmatic mixed-methods study. In this regard, it extends the Ackers (2019) paper by examining recent rhino and rhino poaching data, and analyzing and interpreting the rhino related disclosures contained in the SANParks annual reports to establish what, if anything, has changed since the Ackers (2019) paper. Research pragmatism means that where appropriate, a combination of quantitative and/or qualitative data were analyzed and interpreted to understand the dynamics of South Africa’s illicit rhino poaching industry.

As mentioned in the introduction, despite the interrelated phenomena of rhino poaching and accordingly rhino conservation, being extensively researched since the global outcry over rhino poaching, this was primarily by scholars in the natural sciences. Although accounting scholars such as Ackers (2019) and Atkins et al. (2018) have begun to investigate this phenomenon, the public accountability of the custodians of these threatened rhinos appears to have been under-researched. As such, this paper which builds on Ackers (2019), remains one of the few studies to explore rhino poaching and conservation from the perspective of the accountability of a public sector institution with a specific mandate to preserve South Africa’s biodiversity.

Following the significant increase in rhino poaching, Ackers (2019) adopted an exploratory case study approach to understand how SANParks accounted to the public by disclosing how they had discharged their biodiversity mandate in relation to anti rhino poaching and conservation activities in the protected areas

under its control, for the period 2006 to 2015. This exploratory mixed-methods research approach pragmatically combines both qualitative and quantitative methods, to explore the mechanisms SANParks used to account to their legitimate stakeholders, rather than to collect detailed, precise and replicable data that could be used to accurately predict the phenomenological impact across the entire population.

Aligned to its biodiversity preservation mandate, and given the specific requirement for South African public sector entities to account on their performance in relation to their respective mandates, the units of analysis cover the SANParks annual reports over the six-year period from 2016 to 2021, compared with its performance from 2006 to 2015 (covered in Ackers, 2019). The objective was to analyze the annual report disclosures to determine the extent to which the observed increase in rhino poaching activity influenced the extent to which SANParks disclosed its rhino poaching and anti-poaching activities over the same period. The SANParks annual reports for the sixteen-year period from 2006 to 2021 were uploaded onto Atlas.ti software, which produced detailed lists of the words used for each year. These word list were scrutinized and coded according to the following word categories, namely: (1) crime; (2) firearms; (3) horns; (4) poaching; and (5) rhino. The study observations are divided into two discrete periods. The first covers the ten-year period from 2006 to 2015 (addressed in the Ackers, 2019 study), and the second the subsequent six-year period from 2016 to 2021, with the findings for each period reported on separately.

The empirical component, covering both periods, comprises two phases. To understand the impact of rhino poaching on SANParks rhino poaching and conservation disclosures, the first phase involves a word count of selected rhino poaching and conservation related key words. The second phase uses inferential statistics to probe the relationship between rhino poaching and rhino disclosures, establishing whether increased rhino poaching activities and SANParks rhino-related disclosures were correlated. Kendall Tau and Spearman's (Rho) rank correlation coefficient non-parametric rank correlations are used to determine the existence and strength of the relationships between poached rhinos (the dependent variable), and the SANParks rhino poaching and conservation key words. The correlation coefficients are calculated in two sections – the first analyzes the data over the sixteen-year period, and the second segments the data into two distinct populations (i.e. before and after 2015). Although the relatively few observations imply that the resultant correlations may not be statistically significant, it does nevertheless confirm the robustness of the study.

4. Discussion, analysis and interpretation of study findings

The discussion reflected hereunder draws on observations from secondary data in the public domain relating to rhino poaching and rhino populations, which provide important context for the study. After establishing the trend in rhino poaching, and based on the assertion that as a public sector entity using public resources to deliver its state-mandated biodiversity mandate, SANParks are accountable to the public, the study explores the extent to which SANParks account for their stewardship of South Africa's rhino populations.

4.1 Rhino poaching trends

The increase in illicit rhino poaching over the past two decades is unprecedented, as illustrated in Figure which reveals that rhino poaching in Africa accelerated from only 62 rhinos in 2007 to 262 in 2008, peaking at 1,349 in 2015, stabilising at over 1,100 in 2016 and 2017, before slowly starting to reduce to 773 by 2019, before considering the impact of COVID-19. Prior to this exponential increase in rhino poaching, incidents of rhino poaching in South Africa, including in the KNP tended to be lower than in the rest of Africa. However, by 2009, South African rhino poaching incidents (n=122) exceeded that of the rest of Africa (n=79). Since then South Africa's share of rhino poaching has averaged between 77% and 92%. Similarly, within this context, the KNP which had previously been relatively unscathed, also experienced a devastating increase in rhino poaching. During 2009, the KNP experienced around 25% (n=50) of all rhino poaching incidents in Africa, but by 2014 this had rocketed to 62% of all rhino poaching on the African continent (n=827), and presently represents about 50% of all rhinos poached in Africa. After reaching a peak in 2014-2015, rhino poaching incidents appear to have started to decline. As reflected in Figure 1, almost twice as many rhinos are poached in the KNP than in South Africa's other reserves and parks. This disproportionate rhino poaching is understandable, especially since the KNP is still home to the world's most rhinos in the wild. While KNP's anti rhino poaching interventions appear to have become more effective, poaching in the KNP has declined, but South Africa still remains the primary source of illicit rhino poaching, with other state-owned and private reserves increasingly being targeted. Rhino poaching has also increased in other African countries. As devastating as the COVID-19 pandemic may

have been globally, the severe restrictions imposed by the South African government on the movement of people, appears to have inadvertently reduced rhino poaching.

As reflected in Table 1, although the total rhino population in Africa declined by 13.6% from 2015 to 2021, the impact of poaching has noticeably resulted in South Africa’s rhino population declining by 26%, compared to 33.7% growth in the rhino population in the other African countries over the same period. Interestingly, Africa’s black rhino population (including in South Africa) grew by 18% between 2015 and 2021. Despite ongoing poaching, the growth in the non-South African rhino populations may be attributed to two factors. First, this may represent rhinos relocated from South Africa, as indicated by Thakholi (2021); and second, rhino birth rates in the rest of Africa are lower than poaching rates, suggesting possible “sustainable levels of poaching”. Figure 2, graphically illustrates how incidents of rhino poaching grew from around one rhino every ten days, to more than three rhinos per day in South Africa during 2015 and 2016, before declining to around one animal per day by 2021, with poaching in the KNP following a similar trajectory.

Figure 2: African rhinos poached statistics (2006 to 2021)

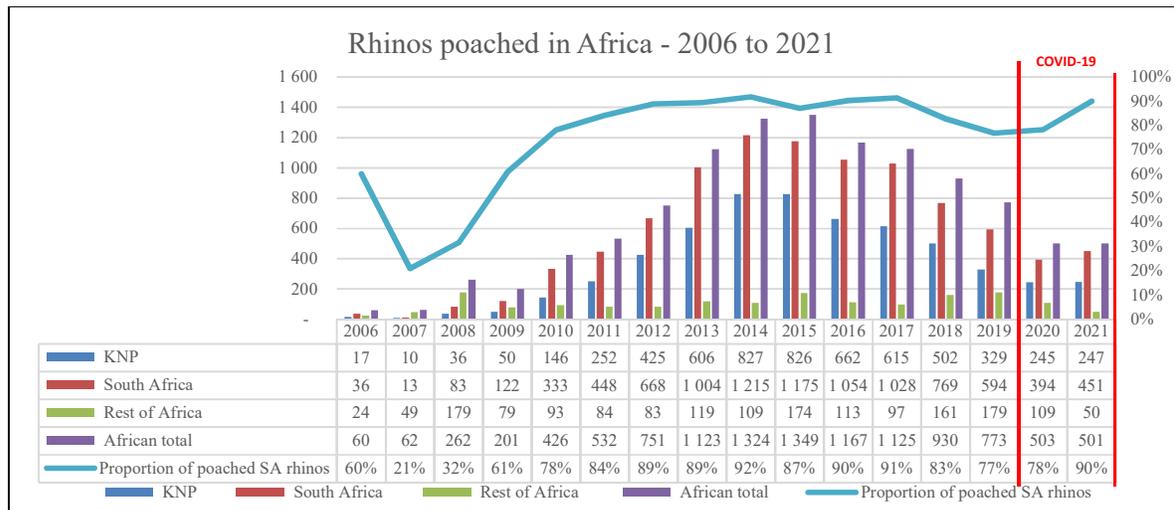
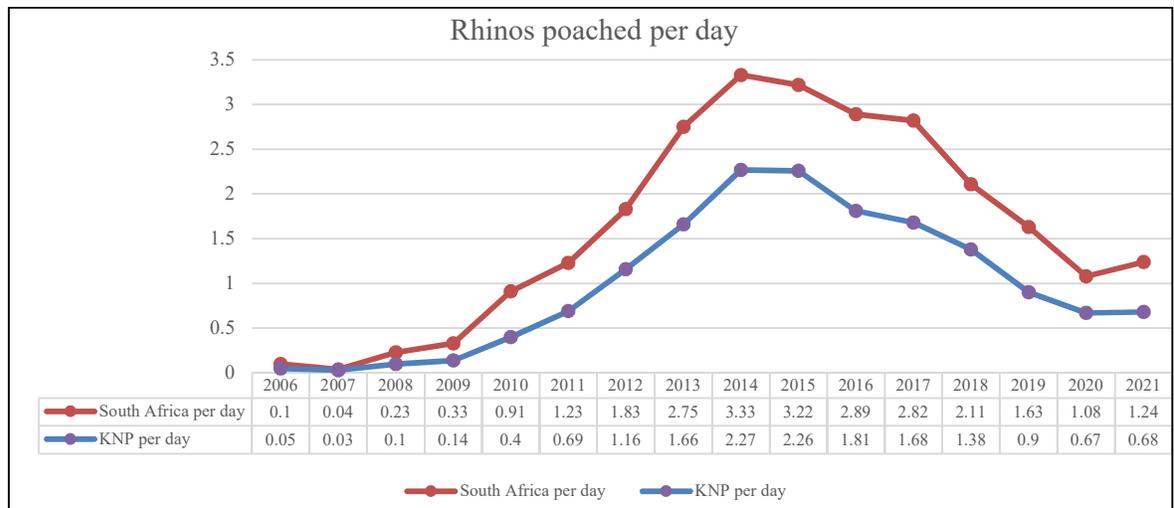


Figure 3: Number of rhinos poached in South Africa per day (2006 to 2021)



4.2 SANParks annual report word count (2006 to 2021)

As mentioned in the methodological section, the SANParks annual reports for the periods from 2006 to 2021 were uploaded to Atlas.ti for further analysis. The word lists produced for each year were grouped according to five themes relating to rhino poaching and conservation. Identified words were thematically categorized and coded as (1) crime, (2) firearms, (3) horns, (4) poaching and (5) rhino. Words associated

with “crime” include crimes, criminal, criminals, arrest, arrests, arrested, arresting, convicted, conviction and convictions; “firearms” include firearm, rifle, weapon and weapons; “horns” include horn and dehorn; “poaching” includes poach, poached, poacher and poachers; and “rhino” includes rhinos and rhinoceros.

As reflected in Figures 3 and 4, the total key words increased significantly to 2012, before reducing slightly and remaining stable until 2015, rapidly increasing until 2018, before reducing, but still remaining at higher levels than 2015. The most frequently used thematic words, were “rhino” and “poaching” respectively, both increasing significantly from 2011. From only six mentions in 2006, “poaching” increased to 61 by 2011, reducing and stabilizing until 2016, when its usage escalated to 89, 105 in 2018, and 133 in 2018, before reducing in 2020, which is attributed to two factors. First, it corresponds with poaching significantly increasing as reflected in Figure 1; and second, may reflect SANParks ramping up its anti-poaching activities. Similarly, “rhinos” increased from 17 in 2006, to 76 in 2011, to 184 by 2017, but remaining relatively high thereafter. Even though “poaching” may have recently declined, this may be part of a deliberate strategy to promote high levels of awareness about the rhino poaching problem, together with improved accountability. The increase in “crime” may be due to improved enforcement resulting in greater success in combatting wildlife crime. Surprisingly, “firearms” and “horns” were seldom, if ever, used. In summary, although the usage of these key words began increasing from 2006 to 2015, usage of these words increased exponentially from 2016. The increased usage of key words coincides with *The Biodiversity management plan for the white Rhinoceros in South Africa 2015-2020*, released by The South African Department of Environmental Affairs (South Africa, 2015) and adopted by SANParks as part of its integrated approach to curbing rhino poaching and sustaining rhino conservation efforts. The length of the SANParks annual reports between 2006 and 2021 varied from as few as 34,461 words in 2012, to as many as 89,523 in 2021.

As reflected in Figure 4, prior to 2007 the proportion of key words to total annual report words, was at its lowest (0.07%), before significantly increasing in 2011 (0.46%) following the escalation in rhino poaching incidents in South Africa and the KNP during 2010, peaking at 0.51% in 2018. These observations suggest that as custodians of most of the world’s rhinos, SANParks appears to have discharged their state-mandated biodiversity obligations relating to rhino conservation, by increasing the extent to which they referred to the rhino poaching and conservation key words in the publicly available annual reports.

Figure 4: Rhino poaching and conservation key words in SANParks annual reports (2006 to 2021)

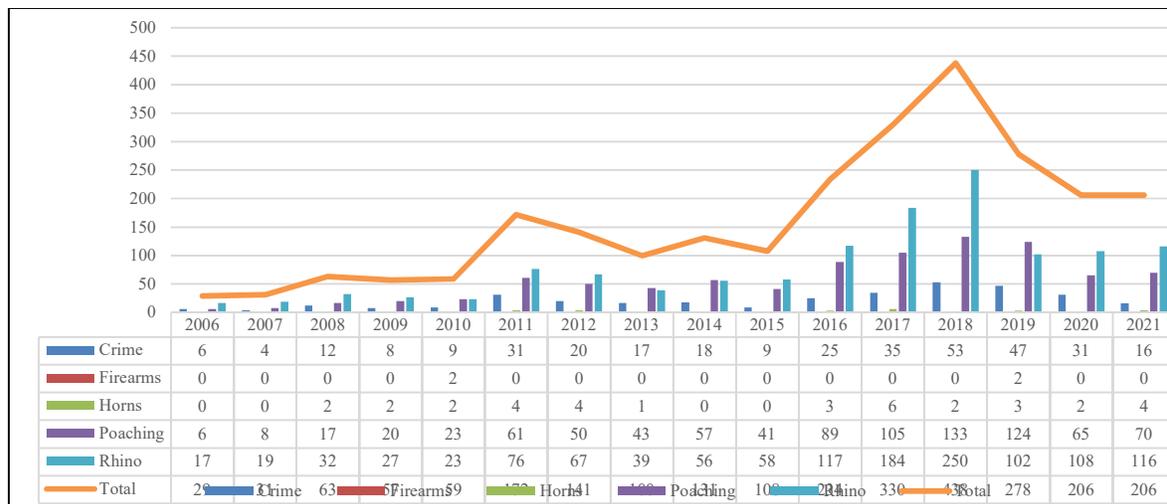
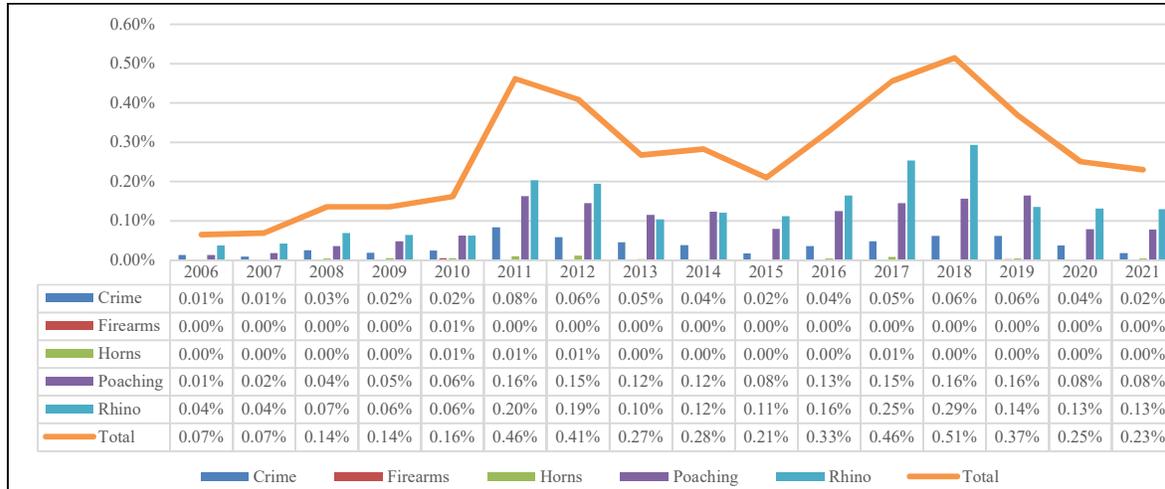


Figure 5: Proportion of poaching and conservation key words in SANParks annual reports (2006 to 2021)



4.3 The relationship between incidents of rhino poaching and related key words

As described in the literature review, all South African public sector entities, including SANParks, are expected to report on their performance in relation to their respective mandates (South Africa, 1999; 2005). In this regard, it is pertinent to note that SANParks only started providing performance related disclosures in 2006, the first year covered by this study. Given its biodiversity mandate, the alarming increase in rhino poaching in South Africa in general and the KNP in particular, creates a normative expectation that SANParks would account for its rhino anti-poaching and conservation performance. To determine the extent to which incidents of rhino poaching have influenced the disclosure of SANParks rhino-related performance, the correlation coefficients between rhino poaching (as the dependent variable) and the key words used by SANParks to describe rhino poaching and conservation in its annual reports (independent variables), were calculated. Extending the work done by Ackers (2019), the results are presented in three tables, covering all the periods of the study. In this regard, Table 5 reflects the data for the entire sixteen years from 2006 to 2021, Table 6 the ten years from 2006 to 2015 (addressed in Ackers, 2019), and Table 7 the six years from 2016 to 2021.

Using Kendall Tau and Spearman's Rho Rank Correlations, Table 5 (from 2006 to 2021), shows strong positive linear relationships between the dependent variable, rhinos poached, and the total key words, as well as crime, poaching and rhino, but a weak negative correlation with firearm and a weak positive correlation with horns. After segmenting the observations into the two reporting periods covered by this study, Table 6 (from 2005 to 2015) reveals very strong positive correlations between rhino-poaching and the total key words, as well as poaching. Although Spearman's Rho showed strong positive correlations for both rhino and horns, Kendall Tau reflected much weaker correlations, while firearms and horns were weakly correlated, or not correlated, using either method. Table 7 (from 2016 to 2021) reveals that rhinos poached were either weakly correlated, or not correlated, with any of the independent variables. The lack of correlation between rhino poaching and any of the key words may be due a combination of decreased incidents of poaching after 2015, possible rhino-poaching disclosure fatigue, and SANParks believing that they were getting to grips with the rhino-poaching problem. It may be concluded that for the entire period under review, although rhino poaching is strongly correlated with the total key words, as well as crime, poaching and rhino, this relationship is entirely attributed to the period leading up to 2015, since no significant relationships between rhino poaching and any of the key words emerged thereafter. Recent rhino poaching data appear to suggest that the combined efforts of conservation and security agencies, are beginning to yield benefits, as evidenced by the increase in rhino-poaching arrests. Although Spearman's Rho is likely to demonstrate stronger correlations than Kendall Tau, both typically still lead to drawing the same inferences (Xu, Hou, Hung, & Zou, 2013).

Table 5: Correlation coefficients between rhinos poached and related key words (2006 – 2021)

Kendall Tau Rank Correlation		Rhinos poached	Total key words	Crime	Firearms	Horns	Poaching	Rhinos
Rhinos Poached	Correlation Coefficient (τ)	1.000	0.4100*	0.4034*	-0.1035	0.1278	0.4333*	0.3667
	Significance (2-tailed p-value)		0.0305	0.0340	0.6914	0.5459	0.0217	0.0529
	N	16	16	16	2	12	16	16
Spearman's Rho								
Rhinos Poached	Correlation Coefficient (r_s)	1.000	0.5843*	0.5302*	-0.1230	0.1314	0.5912*	0.5794*
	Significance (2-tailed p-value)		0.0175	0.0346	0.6500	0.6277	0.0159	0.0187
	N	16	16	16	2	12	16	16

Note: * Correlation is significant at the 0.05 level (2-tailed)

Table 6: Correlation coefficients between rhinos poached and related key words (2006 – 2015)

Kendall Tau Rank Correlation		Rhinos poached	Total key words	Crime	Firearms	Horns	Poaching	Rhinos
Rhinos Poached	Correlation Coefficient (τ)	1.000	0.5556*	0.4944	-0.0497	0.0252	0.6444*	0.4667
	Significance (2-tailed p-value)		0.0318	0.0593	1.0000	1.0000	0.0123	0.0736
	N	10	10	10	1	6	10	10
Spearman's Rho								
Rhinos Poached	Correlation Coefficient (r_s)	1.000	0.7576*	0.6626*	-0.0580	-	0.8182**	0.7333*
	Significance (2-tailed p-value)		0.0111	0.0368	0.8735	1.0000	0.0038	0.0158
	N	10	10	10	1	6	10	10

Note: * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed)

Table 7: Correlation coefficients between rhinos poached and related key words (2016 – 2021)

Kendall Tau Rank Correlation		Rhinos poached	Total key words	Crime	Firearms	Horns	Poaching	Rhinos
Rhinos Poached	Correlation Coefficient (τ)	1.000	0.4140	0.0667	-0.1155	0.2148	0.3333	0.3333
	Significance (2-tailed p-value)		0.3389	1.0000	1.0000	0.6967	0.4524	0.4524
	N	6	6	6	6	6	6	6
Spearman's Rho								
	Correlation Coefficient (r_s)	1.000	0.5798	0.1429	-0.1309	0.3237	0.4857	0.6000

Rhinos Poached	Significance (2-tailed p-value)	0.2278	0.7872	0.8047	0.5315	0.3287	0.2080
N		6	6	6	6	6	6

5 Conclusions

This paper extends the work of Ackers (2019), an early paper specifically examining the emerging phenomenon of biodiversity or extinction accounting, which explored how SANParks accounted for its stewardship of the rhino populations under its control, against the backdrop of the rhino poaching onslaught. Adopting an exploratory interpretative research approach to establish how SANParks has used its annual reports to disclose how it discharged its biodiversity mandate in relation to rhino poaching and conservation. Although this phenomenon has been extensively studied by natural scientists, scant research into the phenomenon has been undertaken from a governance and accountability perspective.

The first phase of the study examined various literature into the phenomenon, to contextually describe the rhino-poaching phenomenon, providing the framework that will be used to assess the study's empirical component. As a public sector entity with a prescribed biodiversity mandate to discharge on behalf of the state, the paper is theoretically grounded using a combination of shareholder and stakeholder theories, as well as their component theories, SANParks is obliged to comply with a defined regulatory framework, which specifies certain governance and reporting requirements with which SANParks must comply.

After uploading all the SANParks annual reports from 2006 to 2021 into Atlas.ti, pertinent key words relating to rhino-poaching and rhino conservation were identified, with the key word frequency analyzed according to each respective reporting period. To understand whether increases in rhino poaching incidents impacted the content of SANParks disclosures relating to rhino poaching and conservation. The key word count covering the sixteen-year period from 2006 to 2021, shows that the total key words, as well as crime, poaching and rhino are strongly correlated with rhinos poached, but weakly correlated with firearm and horns. However, since none of the key words between 2016 and 2021 were correlated with rhino poaching, it may be concluded that the correlations for the sixteen year period were strongly skewed by the 2006 to 2015 reporting period. The absence of any correlation from 2016 could be that despite incidents of rhino poaching decreasing after 2015, that SANParks had adopted a revised approach to combatting rhino poaching and rhino conservation, which included increasing the extent of these disclosures. While SANParks may be improving the manner in which they demonstrate that they have discharged their biodiversity accountability, it may also represent an exercise in perception management aimed at enhancing public perceptions about their legitimacy.

As proposed by Ackers (2019), the impact of the scourge of rhino poaching on the world's rhino populations, including SANParks, requires the adoption of multi-pronged, interdisciplinary and collaborative strategies, involving all relevant parties involved, are beginning to bear fruit, with more arrests relating to rhino poaching being made. This is not only evidenced by the decline in rhino poaching in areas controlled by SANParks, especially the KNP, but also by the observation that aside from white rhinos in South Africa, the rhino populations in the other categories appear to be recovering, with black rhinos populations in South Africa and in the rest of Africa increasing by 18% from 2015 to 2021.

In conclusion, the study confirms that SANParks appears to have accounted for its biodiversity stewardship, not only disclosing that rhino poaching has significantly impacted its operations, but acknowledging the vital role that SANParks plays in combatting rhino poaching and rhino conservation. SANParks does not only discharge this responsibility in the parks and reserves under its control, but also in cooperation and partnership with other key role players in the public and private sectors, as well as with NGOs and concerned private citizens around the world to "save the rhino".

The scope of this study is confined to secondary data obtained from publicly available rhino population, poaching and conservation disclosures. The underlying analysis is based on key words contained in published annual reports of SANParks appropriately covering the reporting period, during which the recent increase in rhino poaching appears to have begun, accelerated and declined. However, since it does not probe the underlying reasons for the study observations, it is recommended that further research is undertaken using a thematic content analysis of annual to identify the specific interventions to combat rhino poaching and for rhino conservation. In addition, semi-structured interviews could be held with key role players involved in anti-rhino poaching and rhino conservation in SANParks as well as in other involved organizations.

References

- Ackers, B. (2019). Accounting for rhinos – the case of South African National Parks (SANParks). *Social Responsibility Journal*, 15(2), 186-207. <https://doi.org/10.1108/SRJ-10-2017-0198>.
- Ackers, B. & Adebayo, A. (2022). The adoption of integrated reporting by state-owned enterprises (SOEs) – an international comparison. *Social Responsibility Journal*, 18(8), 1587-1612. <https://doi.org/10.1108/SRJ-05-2021-0194>.
- Atkins, J., Maroun, W., Atkins, B.C. & Barone, E. (2018). From the Big Five to the Big Four? Exploring extinction accounting for the rhinoceros. *Accounting, Auditing and Accountability Journal*, 31(2), 674-702. <https://doi.org/10.1108/AAAJ-12-2015-2320>.
- Balakrishnan, J., Malhotra, A., & Falkenberg, L. (2017). Multi-level corporate responsibility: a comparison of Gandhi's trusteeship with stakeholder and stewardship frameworks. *Journal of Business Ethics*, 141, 133-150. <https://doi.org/10.1007/s10551-015-2687-0>.
- Borchert, P. (2022). *The general and the rhino war*. Rhino Review, 22 June 2022. Retrieved 7 August 2022, from: <https://rhinoreview.org/the-general-and-the-rhino-war/>.
- Büscher, B. (2016). 'Rhino poaching is out of control!' Violence, race and the politics of hysteria in online conservation. *Environment and Planning A*, 48(5), 979-998. <https://doi.org/10.1177/0308518X16630988>.
- Büscher, B. & Fletcher, R. (2018). Under Pressure: Conceptualising Political Ecologies of Green Wars. *Conservation & Society*, 16(2), 105-113. https://doi.org/10.4103/cs.cs_18_1.
- Büscher, B. & Ramutsindela, M. (2016), Green violence: rhino poaching and the war to save Southern Africa's Peace Parks. *African Affairs*, 115(458), 1-22. <https://doi.org/10.1093/afraf/adv058>.
- Chanyandura, A., Muposhi, V.K., Gandiwa, E., & Muboko, N. (2021). An analysis of threats, strategies, and opportunities for African rhinoceros conservation. *Ecology and Evolution*, 11(11), 5892-5910. <https://doi.org/10.1002/ece3.7536>.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CoP15) (2010). *Illegal killing of rhinoceros in South Africa*. Presented at the Fifteenth meeting of the Conference of the Parties, Doha (Qatar), 13-25 March 2010. Retrieved 28 November 2023, from: <https://cites.org/sites/default/files/eng/cop/15/sum/E15-Com-II-Rec08.pdf>.
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (CoP19) (2022). *Species specific matters: Rhinoceroses*. Presented at the Nineteenth meeting of the Conference of the Parties, Panama City (Panama), 14-25 November 2022. Retrieved 28 November 2023, from: <https://cites.org/sites/default/files/documents/E-CoP19-75.pdf>.
- Cuckston, T. (2018) Making Accounting for Biodiversity Research a Force for Conservation. *Social and Environmental Accountability Journal*, 38(3), 218-226. <https://doi.org/10.1080/0969160X.2018.1516559>.
- Dang, V.H.N. & Nielsen, M.R. (2022a). Rhino horn consumers reveal why a legal trade alone won't save rhinos. *The conversation*, 20 January 2023. Retrieved 25 August 2023, from: <https://theconversation.com/rhino-horn-consumers-reveal-why-a-legal-trade-alone-wont-save-rhinos-173507>.
- Dang, H.N.V. & Nielsen, M.R. (2022b). Understanding determinants of the intention to buy rhino horn in Vietnam through the Theory of Planned Behaviour and the Theory of Interpersonal Behaviour. *Ecological Economics*, 195, 1-10. <https://doi.org/10.1016/j.ecolecon.2022.107361>.
- Dang, H.N.V., Nielsen, M.R., & Jacobsen, J.B. (2022). Conserving rhinos by legal trade: Insights from a choice experiment with rhino horn consumers. *Ecological Economics*, 193, 107287. <https://doi.org/10.1016/j.ecolecon.2021.107287>.
- Ellis, S. (1994). Of Elephants and Men: Politics and Nature Conservation in South Africa. *Journal of Southern African Studies*, 20(1), 53-69. <https://www.jstor.org/stable/2637119>.

- Eloff, C. & Lemieux, A.M. (2014). Rhino poaching in Kruger National Park, South Africa. In Lemieux, A.M. (Ed.), *Situational prevention of poaching: An international perspective*. New York: Routledge, pp.18-43.
- Emslie, R.H., Milliken, T., Talukdar, B., Ellis, S., Adcock, K., & Knight, M.H. (2016). *African and Asian Rhinoceroses – Status, conservation and trade*. CoP17, Doc. 68, Annex 5. Retrieved 1 March 2023, from: <https://cites.org/sites/default/files/eng/cop/17/WorkingDocs/E-CoP17-68-A5.pdf>.
- Fernando, S. & Lawrence, S. (2014). A theoretical framework for CSR practices: integrating legitimacy theory, stakeholder theory and institutional theory. *Journal of Theoretical Accounting Research*, 10(1), 149-178. <https://www.proquest.com/scholarly-journals/theoretical-framework-csr-practices-integrating/docview/1629406998/se-2>.
- Ferreira, S.M., Bissett, C., Cowell, C.R., Gaylard, A., Greaver, C., Hayes, J., Hofmeyr, M., Moolman-van der Vyver, L., & Zimmermann, D. (2017). The status of rhinoceroses in South African National Parks. *Koedoe*, 59(1), a1392. <https://doi.org/10.4102/koedoe.v59i1.1392>.
- Ferreira, S.M., Greaver, C., Knight, G.A., Knight, M.H., Smit, I.P.J., & Pienaar, D. (2015) Disruption of Rhino Demography by Poachers May Lead to Population Declines in Kruger National Park, South Africa. *PLoS ONE*, 10(6), e0127783. <https://doi.org/10.1371/journal.pone.0127783>.
- Ferrero-Ferrero, I., Fernández-Izquierdo, M.A., Muñoz-Torres, M.J., & Bellés-Colomer, L. (2018). Stakeholder engagement in sustainability reporting in higher education: An analysis of key internal stakeholders' expectations. *International Journal of Sustainability in Higher Education*, 19(2), 313-336. <https://doi.org/10.1108/IJSHE-06-2016-0116>.
- Foxcroft, L.C., Van Wilgen, N.J., Baard, J.A., & Cole, N.S. (2017). Biological invasions in South African National Parks. *Bothalia*, Vol. 47(2), a2158. <https://doi.org/10.4102/abc.v47i2.2158>.
- Freeman, R.E. & McVea, J. (2001). A stakeholder approach to strategic management, in Hitt, M.A., Freeman, R.E. & Harrison, J.S. (Eds), *Handbook of Strategic Management*, Blackwell, Oxford, UK.
- Hübschle, A. (2016). Security coordination in an illegal market: the transnational trade in rhinoceros horn. *Politikon*, 43(2), 193-214. <https://doi.org/10.1080/02589346.2016.1201377>.
- Hübschle, A.M. (2017). The social economy of rhino poaching: Of economic freedom fighters, professional hunters and marginalized local people. *Current Sociology*, 65(3), 427-447. <https://doi.org/10.1177/0011392116673210>.
- Hussain, N., Rigoni, U., & Orij, R.P. (2018). Corporate governance and sustainability performance: analysis of triple bottom line performance. *Journal of Business Ethics*, 149(2), 411-432. <https://doi.org/10.1007/s10551-016-3099-5>.
- Jensen, M.C. & Meckling, W.H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X).
- Jones, T.M., Harrison, J.S., & Felps, W. (2018). How applying instrumental stakeholder theory can provide sustainable competitive advantage. *Academy of Management Review*, 43(3), 371-391. <https://doi.org/10.5465/amr.2016.0111>.
- Kilic, M. & Kuzey, C. (2018). Determinants of forward-looking disclosures in integrated reporting. *Managerial Auditing Journal*, 33(1), 115-144. <https://doi.org/10.1108/MAJ-12-2016-1498>.
- Koot, S. (2021). Enjoying extinction: philanthrocapitalism, jouissance, and “excessive environmentourism” in the South African rhino poaching crisis. *Journal of Political Ecology*, 28(1), 804-822. <https://doi.org/10.2458/jpe.2984>.
- Lunstrum, E. (2014). Green militarization: anti-poaching efforts and the spatial contours of Kruger National Park. *Annals of the Association of American Geographers*, 104(4), 816-832. <https://doi.org/10.1080/00045608.2014.912545>.
- Lunstrum, E. (2018). Capitalism, wealth, and conservation in the age of security: the vitalization of the state. *Annals of the American Association of Geographers*, 108(4), 1022-1037. <https://doi.org/10.1080/24694452.2017.1407629>.

- Lunstrum, E. & Givá, N. (2020). What drives commercial poaching? From poverty to economic inequality. *Biological Conservation*, 245(6), 108505. <https://doi.org/10.1016/j.biocon.2020.108505>.
- Massé, F. & E. Lunstrum. (2016). Accumulation by securitization: commercial poaching, neoliberal conservation, and the creation of new wildlife frontiers. *Geoforum*, 69, 227-237. <https://doi.org/10.1016/j.geoforum.2015.03.005>.
- Milledge, S. (2005). *Rhino Horn Stockpile Management: Minimum standards and best practices from east and southern Africa*. TRAFFIC, Tanzania. Retrieved 5 March 2023, from: https://www.traffic.org/site/assets/files/4060/rhino_horn_stockpile_management.pdf.
- Minaar, A. & Herbig, F. (2018). The impact of conservation crime on the South African rural economy - a case study of rhino poaching. *Acta Criminologica: Southern African Journal of Criminology*, 31(4), 147-168. <https://hdl.handle.net/10520/EJC-159791abf8>.
- Moneron, S., Brock, B., & Newton, D. (2020). *Insights from the Incarcerated: An assessment of the illicit supply chain in wildlife in South Africa*. TRAFFIC, Cambridge, UK. Retrieved 12 September 2022, from: <https://www.traffic.org/publications/reports/insights-from-the-incarcerated/>.
- Moneron, S., Okes, N., & Rademeyer, J. (2017). *Pendants, Powder and Pathways*. TRAFFIC, East/Southern Africa Regional Office, Hatfield, Pretoria, South Africa. Retrieved 12 September 2022, from: <https://www.traffic.org/publications/reports/pendants-powder-and-pathways/>.
- Nhleko, Z.N., Ahrens, R., Ferreira, S.M., & McCleery, R.A. (2022). Poaching is directly and indirectly driving the decline of South Africa's large population of white rhinos. *Animal Conservation*, 25, 151-163. <https://doi.org/10.1111/acv.12720>.
- Novellie, P., Biggs, H., & Roux, D. (2016). National laws and policies can enable or confound adaptive governance: examples from South African National Parks. *Environmental Science and Policy*, 66, 40-46. <https://doi.org/10.1016/j.envsci.2016.08.005>.
- Pienaar, D.J., Hall-Martin, A.J., & Hitchins, P.M. (1991). Horn growth rates of free-ranging white and black rhinoceros. *Koedoe*, 34(2), 97-105. <https://doi.org/10.4102/koedoe.v34i2.426>.
- South Africa (1999). *Public Finance Management Act*. Retrieved 7 July 2021, from: <https://www.treasury.gov.za/legislation/pfma/PFMA%201999%20as%20amended%20March%202021.pdf>.
- South Africa (2002). *Protocol on corporate governance in the public sector*. Retrieved 2 April 2020, from: https://www.gov.za/sites/default/files/gcis_document/201409/corpgov0.pdf.
- South Africa (2003). *National Environmental Management: Protected Areas Act*. Retrieved 25 September 2022, from: https://www.gov.za/sites/default/files/gcis_document/201409/a57-03.pdf.
- South Africa (2005). *Treasury Regulations for departments, trading entities, constitutional institutions and public entities, issued in terms of the PFMA*. Retrieved 3 April 2020, from: https://www.treasury.gov.za/legislation/pfma/regulations/gazette_27388.pdf.
- South Africa (Department of Environmental Affairs) (2013). *Rhino Issue Management Report, 2013*. Retrieved 1 March 2023, from: https://www.dffe.gov.za/sites/default/files/docs/rhinoissue_managementreport.pdf.
- South Africa (Department of Environmental Affairs) (2015). *Biodiversity management plan for the white Rhinoceros (Ceratotherium simum) in South Africa 2015-2020*. Retrieved 1 March 2022, from: https://www.gov.za/sites/default/files/gcis_document/201512/39469gen1191.pdf.
- Ștefănescu, C.A., Opreșor, T. & Sintejudanu, M.A. (2016). An original assessment tool for transparency in the public sector based on the integrated reporting approach. *Journal of Accounting and Management Information Systems*, 15(3), 542-564. http://online-cig.ase.ro/jcig/art/15_3_5.pdf.
- Styhre, A. (2018). The making of the shareholder primacy governance model: price theory, the law and economics school, and corporate law retrenchment advocacy. *Accounting, Economics and Law: A Convivium*, 8(3), 1-31. <https://doi.org/10.1515/acl-2016-0021>.
- Thakholi, L. (2021). The biopolitics of private conservation: jeopardizing labor and rhino to optimize capital? *Journal of Political Ecology*, 28(1), 705-720. <https://doi.org/10.2458/jpe.4764>.

- Thomas-Walters, L., Hinsley, A., Bergin, D., Burgess, G., Doughty, H., Eppel, S., MacFarlane, D., Meijer, W., Lee, T.M., Phelps, J., Smith, R.J., Wan, A.K.Y. & Verissimo, D. (2020). Motivations for the use and consumption of wildlife products. *Conservation Biology*, Vol. 35(2), pp.483-491. <https://doi.org/10.1111/cobi.13578>.
- United Nations Environmental Programme (UNEP) (2021). *Measuring Progress: Environment and the SDGs*. Retrieved 21 March 2023, from: <https://www.unep.org/resources/publication/measuring-progress-environment-land-sdgs>.
- United Nations Office on Drugs and Crime (UNODC) (2020). World Wildlife Crime Report: Trafficking in protected species, 2020. Retrieved 3 March 2023, from: https://www.unodc.org/documents/data-and-analysis/wildlife/2020/World_Wildlife_Report_2020_9July.pdf.
- Walther, F. (2015). New public management: the right way to modernise and improve public services. *International Journal of Business and Public Administration*, 12(2), 132-143. <https://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=112370750&site=eds-live&scope=site>.
- Wildlife Justice Commission (2022). Rhino horn trafficking as a form of transnational organised crime 2012-2021. Retrieved 5 March 2023, from: <https://wildlifejustice.org/wp-content/uploads/2022/11/Rhino-Horn-Trafficking-Report-2022-V21-Spreads.pdf>.
- Xu, W., Hou, Y., Hung, Y.S. & Zou, Y. (2013), A comparative analysis of Spearman's rho and Kendall's tau in normal and contaminated normal models. *Signal Processing*, 93(1), 261-276. <https://doi.org/10.1016/j.sigpro.2012.08.005>.