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LARGE-SCALE COLLECTIVE ACTION OVER WILDLIFE AND NATURAL RESOURCES

Prospects in reaching compliance with conservation
rules by resource users: The Case of Kavango
Zambezi Conservation Area

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Abstract

Many of today's global environmental problems could be mitigated through large-scale collective action between different actors. Still, most theoretical assumptions on how collective action can be reached over natural resources is based on empirical work within small- to medium scale common-pool-resources. Thus, how large-scale collective action is achieved in more large and complex commons such as transfrontier conservation areas over wildlife and natural resources is not that evident. Focusing on the Kavango Zambezi Transfrontier Conservation Area in southern Africa, with the point of departure in theories about collective action and the literature of rule compliance, this study examines to what extent previous theories can explain resource user's willingness to comply with conservation rules imposed by higher state authorities; an aspect that could be important in reaching large-scale collective action. Using a mixed-method design, the study applies public opinion data from the Afrobarometer on corruption and trust in local authorities and these factors' effect on a proxy measure for rule compliance – deforestation on a local level. Furthermore, unique qualitative data is applied from interviews with elite officials and key stakeholders and their perceptions on resource users' motives for following conservation rules. Vertical trust, co-management and deterrence strategies are suggested to be important in generating compliance. Still, transboundary conservation could face other challenges such as incompatible policies as well as slow institutional change which in turn could lower compliance.

Keywords: *Large-scale collective action, compliance with conservation rules, natural resource management, poaching, transboundary conservation, Southern Africa.*

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Introduction

What challenges and opportunities are there in generating compliance with conservation rules by resource users in transboundary conservation and thereby reach large-scale collective action over wildlife and natural resources? Answering this question could contribute to the mitigation of ecosystem degradation and biodiversity loss – important issues both in terms of conservation, countries' economies and human well-being (IUCN 2016; UNEP-WCMC & IUCN 2016).

The management of natural resources has been studied from several different research disciplines. In political science, the role of institutions is often highlighted i.e. how formal and informal rules shapes human behaviour in acting collectively over natural resources when limiting access and defining rights and duties (North 1990; Ostrom et al. 1999; Agrawal 2002). While much of the empirical work has focused on how local rules and norms evolve among resource users and their effect in small- to medium-scale common-pool-resources such as forests, irrigation systems and inshore fisheries (Baland & Platteau 1996; Ostrom et al. 1994; Schlager et al. 1994; Ostrom 1990; Gibson et al. 2005; Varughese & Ostrom 2001) many of today's environmental problems are of a more global and complex character.¹ Large-scale commons such as climate change or biodiversity loss cannot be managed within one village or one single country. Hence the mitigation of these problems demands large-scale collective action between many resource users and stakeholders stretching from local to international levels (Ostrom et al. 1999). The involvement of many resource users with different interests and identities could further increase the difficulty of organizing, agreeing on and enforcing common rules by resource users themselves (Ostrom 1999:281). In other words, it could become harder for resource users to build social norms of trust and reciprocity as well as for resource users to uphold effective monitoring mechanisms on their own in the management of these large-scale commons. Resource users could thereby lose incentives for voluntary compliance not trusting that others will follow rules leading to an unsustainable use of the resource (Ostrom 1998; Mansbridge 2014). This leads to the large-scale collective action dilemma where a sustainable management of these large-scale commons demands cooperation

¹ A common-pool resource e.g. a lake, a forest, the atmosphere or wildlife is a natural or man-made resource from which it is difficult to exclude or limit consumption by users while one user's consumption of resource units decrease resource units available to other people (Ostrom et al. 1994). The focus here in this study is on larger-scale resources meaning that they straddle over a large spatial area such as wildlife and habitats thus involving many resource users and stakeholders.

at several levels and between many resource users. Although the question is how to coordinate this and ensure cooperative behaviour between all actors involved.

Following this, reaching large-scale collective action over natural resources could require the involvement of a third-party to induce rule compliance by resource-users.² As Elinor Ostrom (1998:17) stated “[...] Without some external support of such [higher-level-state] institutions, it is unlikely that reciprocity alone completely solves the more challenging common-pool-resource problems”. Thus, with the ability to enact regulations (Ostrom 2010:552), monitor illegal activities (Mansbridge 2014:8) as well as technical and material assistance (Agrawal & Gibson 1999; 638-639) a third party could play an essential part in reaching large-scale collective action. However, if the rules imposed by the third-party are not followed by resource users, national parks and animals are only protected formally on paper (Arias 2015; Branch et al. 2013; Wilkie et al. 2011). This suggests that reaching large-scale collective action could be dependent on resource user’s complying with rules and policies imposed by higher level authorities. The question is how this could be achieved.

Previous literature has identified several potential factors affecting compliance with rules such as economic benefits (Becker 1968; Keane et al. 2008) moral obligations (Tyler 2001), social norms of trust and reciprocity (Ostrom 1998), trust in the state (Ostrom & Becker 1995) and corruption (Damaina 2002; Smith & Walpole 2005). However, as mentioned, most studies within the field of natural resource management have focused on compliance with local rules in small-to medium-scale commons (see for example Agrawal 2002; Baland & Platteau 1996; Dietz et al. 2003). Hence, there is a lack of understanding how theories on compliance perform and function when scaling up to a larger setting over natural resources where the need of a third-party involvement is salient. In this light, this study focus on Transfrontier Conservation Areas (TFCA’s) – a new conservation paradigm that have evolved during recent decades around the world. TFCA’s imply the management of wildlife and natural resources over political borders i.e. between states, with the aim to increase conservation effectiveness (Muchapondwa & Ngwaru 2010:1). In turn, comprehending many resource users as well as different state actors managing wildlife and habitats over a large area, TFCA’s could be

² Large-scale collective action is referred to collective action over large-scale common-pool resources, although I use the words interchangeably.

regarded as large-scale collective action regimes. These regimes offer interesting ways to examine how higher state institutions can be successful in ensuring compliance with conservation rules by resource users over large-scale commons. In other words, transfrontier conservation is a good case of the large-scale collective action dilemma. Following this, the empirical focus of the study is Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), established in 2011 between Botswana, Angola, Zimbabwe, Zambia and Namibia. This is the biggest TFCA in the world (the size of France), with about two million people living in the region and further having Africa's biggest elephant population (KAZA 2015:14).

The aim of the study is thus to examine how and why different factors influence compliance with conservation rules by resource-users in large-scale commons such as transboundary conservation and thereby understanding how large-scale collective action can be achieved.³ This study then explores empirically how well previous expectations concerning rule compliance perform in this transboundary setting and what needs to be revised theoretically when looking at large-scale collective action over wildlife and natural resources. The study thus contributes to the research field on collective action as well as on transboundary conservation.

Using a mixed-method design, the study consists of two parts and both test previous hypotheses as well as derive new insights into the field. The first part statistically tests the effect of two factors i.e. trust and corruption, that have previously been identified as important for compliance, on a proxy measure for rule compliance – in this case deforestation on a local level. By using public opinion from the Afrobarometer on perceptions of government corruption and trust in state authorities, combined with objective measures (satellite data) on deforestation the study tries to understand how the local variation in these factors could explain rule compliance in transboundary conservation. The second part use the unique knowledge and expertise derived from 15 interviews performed with elite officials and key stakeholders working in KAZA TFCA. As there is theoretical uncertainties concerning how compliance can be reached when scaling up to a large-scale setting such as transboundary conservation the best way to explore these issues further is to talk to people that are experts on the subject. Hence,

³ In this study, compliance refers to the adherence to rules related to natural resources utilisation and conservation (Arias 2015:134). Compliance could be interpreted as a dichotomy i.e. whether a person or a system adheres to the rules or not. In this study I follow the same definition of compliance as Arias (2015) and Sundström (2016) referring to a gradation of behaviour i.e. the degree of adherence to rules e.g. when a person in general respects the rules, but not always.

through these informants' perceptions on resource-users' motives on compliance, the study is able to explore factors and mechanisms not possible to reveal through the statistical data. By combining these two methods the hope is to get a broader and more valid picture of the research problem.

The rest of the thesis is structured as follows. The next section proceeds with a background on the emergence of TFCA's and previous research within the field. The third section presents and discusses the theoretical framework focusing on collective action theory and further presents factors that have previously been identified as affecting compliance. Following this section, the aim and research questions of the study is outlined. Section five discusses the case of KAZA TFCA, as well as choice of method and data. In section six, the results from the statistical analysis as well as from the qualitative analysis is presented. Thereafter follows an analysis and discussion of the results. Finally, the last section outlines the conclusions of the analysis as well as suggestions for future research.

Previous research on transboundary conservation

The management of biodiversity and natural resources has over decades generated different management strategies to reach more successful conservation policies. Going from integrated conservation-development programs (ICDPs) (see for example Brandon & Wells 1992) to community-based natural resource management (CBNRM) (see for example Blaikie 2001), today - transboundary natural resource management could be regarded as the new conservation paradigm spreading around the world (Bhatasara et al. 2013). This conservation paradigm stems from the concept 'bioregionalism' recognising that ecosystems do not coincide with political borders; hence when dealing with natural resources and wildlife, ecological boundaries should be prioritized over political boundaries. The aim is thus to expand protected areas, through the linkage with other countries' protected areas, preventing habitat fragmentation and thus improving biodiversity and natural resource conservation (Muchapondwa & Ngwaru 2010:2).⁴ Involving joint management and collaboration over natural resources and biodiversity, these

⁴ Throughout this study, I will use the term TFCA's. The Southern African Development Community (SADC) defines a TFCA as "the area or a component of a large ecological region that straddles the boundaries of two or more countries, encompassing one or more protected areas as well as multiple resource use areas" (SADC 2012).

conservation areas are further aiming at establishing peace and cooperation among countries (Hanks 2003; Sandwith et al. 2001). In addition, TFCA's are suggested to generate economic development and enhance the livelihoods of rural communities through ecotourism and the inclusion of communities in natural resource management (Spenceley 2006).

Following the establishment of these TFCA's, a vast research field has emerged trying to understand and examine the challenges and prospects for these parks to be successful. There is a broad field of research within ecology and biology focusing on whether TFCA's improve conservation of biodiversity and other ecological aspects with mixed results (see for example Van Aarde & Jackson 2007; Plumptre et al. 2007; Selier et al. 2014). There are also researchers whom have examined the role of the state. Since NGOs, donors and companies are usually involved in the establishment and maintenance of TFCA's this could have implications for the sovereignty of the national state as responsibilities over conservation are given to non-state entities (Wolmer 2003; Duffy 2006; Büscher & Dietz 2005). Furthermore, whether these transboundary conservation areas have the potential in generating cooperation between states have resulted in several studies emerging from the field of international relations, with the departure in environmental peace-making and security theories (Ali 2007; Shaw 2003; Westing 1998). However, most of these studies have been on a theoretical level and based on many local case-studies (van Amerom & Büscher 2005; Duffy 2006; King & Wilcox 2008), although there are some exceptions. Zibics (2003) surveys levels of cooperation within the administration of transboundary parks while Barquet et al. (2010) evaluates transboundary protected areas potential in mitigating conflicts using global data on protected areas as well as militarized interstate disputes - both studies indicating that TFCA's actually could increase cooperation between states.

In the other end of the spectrum, researchers have focused on TFCA's impact on peoples' livelihoods. The results indicate a somewhat dark picture where communities in some instances have been removed from their homes to make space for wildlife (Munthali 2007:53; Ferreira 2006:171) and where the demands for productive agricultural land as well as enhanced socio-economic conditions have not been fulfilled to the communities (Spenceley 2006:663; Schuerholtz & Baldus 2008), which in turn could lead to conflicts between communities since promised revenues and jobs are not delivered (Jones 2005:276). Finally, during recent decades some scholars have begun to evaluate the role of institutions such as organisational structures

in the establishment, maintenance and development of TFCA's (Schoon 2007; Schoon 2013; Muchapondwa & Ngwaru 2010). For example, Schoon (2013) use theories on institutional robustness, investigating how differences in organisational structures influence collaboration between officials in the parks, where bottom-up approaches seem to increase cooperation compared to a top-down implementation of transboundary projects.

To summarize, the field on transboundary conservation comprehends a broad spectrum of topics and disciplines. Although a developing field, there is still limited empirical work on the role of institutions in terms of how rules shape human behaviour in transboundary conservation. Scholars within the field of political science have for a long time recognized the role of institutions i.e. the role of formal and informal rules in resource users acting collectively over natural resources when limiting access and defining rights and duties (North 1990; Ostrom et al. 1999; Agrawal 2002). However, how compliance with rules by resource users can be achieved is something that previous studies within the field of transboundary conservation have overlooked. This empirical and theoretical gap is the point of departure for this study. Thus, the study diverges from previous research when not focusing on cooperation between states or at higher institutional levels such as administrations. Instead, I follow those researchers whom have focused on the communities i.e. the resource users. Still, previous studies at the local level have mainly examined the connection between conservation of natural resources and poverty alleviation by focusing on for example the role of tourism. In contrast, this study brings in a new theoretical lens from both the collective action and compliance literature. To fully understand how sustainable use of natural resources can be achieved in transboundary conservation, I argue that one must acknowledge what kind of incentive structures that induce people to follow conservation rules since this could influence prospects in reaching large-scale collective action. This entails examining the relationship between resource users and higher state authorities in generating adherence with rules imposed from above. In the next section, the theoretical underpinnings of the study will be outlined.

Theoretical framework

This section examines the theoretical underpinnings of the study, with the point of departure in collective action theory and the role of institutions in natural resource management, then proceeding with reviewing previous research and theories on factors that potentially affect compliance. The section is concluded with a discussion of the expectations of compliance in natural resource management when scaling up from small-scale collective action to large-scale collective action.

The collective action dilemma

From a social science perspective, the management of natural resources highlights the importance of institutions to avoid over-exploitation of a given resource. Institutions could play an important role in the management of natural resources when lowering uncertainty; enhancing human cooperation and coordination, both through formal rules and organisational structures, as well as through informal norms and practices (North 1990:25).⁵ At the centre of this research field lies collective action theory, focusing on how and under what conditions cooperative behaviour over natural resources is possible (Ostrom 1990; Agrawal 2002). This theory goes back to the famous work by Garret Hardin (1968) on “The Tragedy of the commons” as well as Mancur Olson’s (1965) work on the logics of collective action. In short, collective action refers to situations where decisions about costly actions are made independently but outcomes influence everyone involved. Hence, if humans only act in their self-interest this would lead to the inability to act collectively and generating sub-optimal outcomes for the collective (Ostrom 2014:551). At the core of these models lies the so called free-rider problem. When a person cannot be excluded from enjoying the benefits provided by others, each person is encouraged not to contribute to the collective’s efforts. Instead each person chooses to free-ride on the efforts by others (Ostrom 1990:6). This could have immense consequences for the environment

⁵ Institutions are here referred to as sets of formal and informal rules and norms that shapes interactions between humans and between human and their environment; by constraining some activities and permitting others (North 1990:3). Institutions are then prescriptions that humans use to organize all kinds of repetitive and structured interactions, straddling from interactions within e.g. families and neighbours in the community to governments and private firms (Ostrom 2005:3).

since there is always an incentive to participate in activities that are damaging rather than acting collectively and thus sustaining resources (Ostrom et al. 2002:19).

Nevertheless, even though these theories give a rather dark picture of human behaviour both laboratory and field work find that people do cooperate over natural resources when building and maintaining self-governing institutions, establishing their own regulatory systems of local rules and norms (Baland & Platteau 1996; Agrawal 2002; Ostrom 1998:5; Ostrom et al. 1994; Schlager 1990). This comprehends a large empirical literature exploring how collective action can be achieved in small- to medium-scale common-pool-resources. For example, factors such as small group of resource users, well defined boundaries of the resource, homogeneity of identities and interests among resource users and effective monitoring techniques have emerged as important for cooperation (Ostrom 1998:2).⁶ In contrast, scholars have started to pay more attention to large-scale collective action when recognizing the global scale of many environmental problems e.g. climate change, transboundary pollutions and poaching of wildlife (Dietz et al. 2003; Ostrom 2010; Schoon 2013). These are resources that cannot be managed in one village or even within one single country, involving a large number of resource users with different identities and interests. This in turn creates difficulties in building social norms of reciprocity as well as upholding effective monitoring by resource users themselves - making it harder to reach collective action as the prospects for voluntary compliance with rules decrease (Ostrom 1998; Mansbridge 2014). Thus, some type of large-scale institutional arrangement is needed to reach cooperation in more complex and larger common-pool resources (Ostrom 2005:278). This has resulted in a greater attention to the relationship between higher level authorities and the citizens i.e. the vertical relationship, in generating collective action (Sjöstedt 2013; Mansbridge 2014; Sjöstedt & Sundström 2014). For example, the state could play an important role in large-scale collective action with the ability to enact regulations (Ostrom 2010), provide neutral information, monitoring compliance and imposing sanctions on resource users (Mansbridge 2014:8) as well as technical and material assistance (Agrawal & Gibson 1999; 638-639). However, even though a government imposes rules to overcome free-riding, the rules need to be enforced and followed by the citizens for

⁶ This is just some of the important variables identified for collective action in resource management. For a more in-depth description see for example Ostrom 1990; Baland & Platteau 1996.

efficient cooperation in large-scale conservation (Ostrom et al. 2002:20; Dietz et al. 2003:1909).

Together, this raises questions concerning how this third-party actor can be successful in ensuring compliance with conservation rules in reaching large-scale collective action over natural resources (Dietz et al. 2003:1908). In this light, I argue that these TFCA's or 'mega-parks' can be regarded as large-scale collective action dilemmas. Covering large spatial areas and fugitive resources, people are depending on a third-party involvement concerning e.g. enforcement, surveillance and information-sharing for them to follow rules and hence acting collectively in transboundary conservation. However, even though there are conservation rules imposed by higher state authorities, if these rules are not adhered to by resources users in TFCA's, the regulatory framework becomes rather meaningless. In other words, protected areas are at risk of becoming so called 'paper parks' when only being protected formally on paper (Gibson et al. 2005:275). Thus, understanding how state authorities in transboundary conservation can ensure compliance with rules by people living within these areas becomes an interesting issue. In the next section, factors that have previously been identified within the field of motivating compliance, will be discussed in further detail.

Identifying motives for compliance with conservation rules

Following the literature on compliance with rules, two different strands emerge – theories based on economic models versus theories derived from a normative strand. Economic models build on the idea that rational individuals' willingness to comply with rules depends on whether the benefits anticipated of following the rules outweigh the costs (Becker 1968). In other words, people's decision to break conservation rules is based on a calculation of potential gains of breaking the rules versus risks of being caught by law enforcement officers. Hence, advocates of this economic model proclaim deterrence as a solution to rule violations, implying that people will only follow rules when confronted with hard sanctions, monitoring, and surveillance (Becker 1968:176-177; Keane et al. 2008:76). However, implementing more and better enforcement is a costly project (Tyler 2001:2442; Levi et al. 2009:355), especially in large-scale collective action settings where monitoring and surveillance could be more difficult

(Scholz & Lubell 1998:400). This is where the normative perspective comes in, highlighting possibilities for voluntary compliance through peoples' internal values.

Firstly, adherence to rules can be driven by people's moral obligations, being more likely to adhere to rules if they perceive that these are corresponding to their moral beliefs and values (Tyler 2001: 2443). In addition, people's perception of what is right or wrong can be driven by the moral norms of the collective (Gezelius 2004:618; Keane et al. 2008:77). Hence, non-compliance can be tolerated within the collective if the motive is a morally accepted reason e.g. breaking rules for subsistence needs (Gezelius 2004:615).

Secondly, trust is argued to be an essential driver for human cooperative behaviour and compliance – both between citizens i.e. horizontal trust and between the citizens and the state i.e. vertical trust (Ostrom 1998; Ostrom 1990; Sjöstedt 2013). Regarding horizontal trust, the idea is that even though people are willing to resist from opportunistic behaviour, if you do not trust and have the information that others will do the same – you will not change behaviour since this will not generate any good (Rothstein 2000; Levi 1991). Hence, the emergence of norms and social rules of trust and reciprocity between people is important for cooperative behaviour (Ostrom 1998:2; Becker & Ostrom 1995:116). Regarding vertical trust, this theoretical perspective derives mainly from social contract theories, explaining how the authority who is the superior enforcer of institutional arrangements e.g. the state, can credibly commit to deliver on its promises (see for example Firmin-Sellers 1995; Greif 2005). The importance of trust in the state can be illustrated through the vertical dilemma, where both actors i.e. the state and the resource users would benefit most of the situation if the state enforced certain rules affecting a given resource and where the resource users complied, leading to sustainable resource management and less monitoring costs for the state. However, due to the lack of a third-party involvement, none of the actors can trust that the other part will fulfil their commitments, resulting in the worst outcome where the government does not enforce the rules and where resource users do not comply, causing resource depletion (Gibson 1999:10; Sjöstedt 2013:619). Therefore, there is a need to establish a credible commitment and a

reputation of trustworthiness between the resource-users and the state to generate compliance with conservation rules (Rothstein 2000:483).⁷

Thirdly, trust further influences the legitimacy of the enforcer. Legitimacy is defined as the general acceptance by the public that the law and the authority has the right to prescribe public behaviour (Levi et al. 2009:354). If authorities are perceived as legitimate, then people will feel a personal responsibility to comply with the rules voluntarily (Tyler 2001:2443). The perceived legitimacy of the authority is linked to the justice and effectiveness of the outcomes of rules and the fairness and efficiency of the regulatory process (Sutinen & Kuperan 1999:182). The justice and effectiveness of the outcomes concerns to what extent people are made better off from the outcomes and further how the benefits are distributed (Levi et al. 2009:356). Efficiency of the process includes how fast the authority respond to a given problem (Sutinen & Kuperan 1999:182-183) while procedural fairness concerns people's experiences of the law enforcement authority regarding the procedures through which rules are created and implemented (Tyler 2001: 2444; Levi et al. 2009:360). Hence, if people perceive that they are being treated unfairly by the authorities, this could erode legitimacy of the authorities and hence lowering compliance (Nielsen 2003:428). Procedural fairness is also important for the trustworthiness of the state. If one has been treated fairly through a procedure by a state department, people are more likely to trust that department once again (Murphy 2004:190).

In contrast to the deterrence model, the normative strand highlight the inclusion and empowerment of local communities into the management and decision-making of natural resources to improve compliance (Jentoft 1989:139; Jagers et al. 2012:974). If the moral voice and social influence of resource users are ignored, this could erode compliance when rules are not shaped such that resource users perceived them as morally justifiable (Gezelius & Hauck 2011:443) eroding the legitimacy in state authorities (Stern 2008:201).

Finally, corruption, recognised as 'the unlawful use of public office for private gain' (Treisman 2007:211), is one contextual factor that could influence the quality of

⁷ There is a large literature on different suggested mechanisms to establish this credible commitment stretching from professional bureaucracy (Rauch & Evans 2000), fragmentation of power (Falaschetti & Miller: 2003), regime type such as democracy (Acemoglu & Robinson 2006) to the quality of government i.e. the efficiency of institutions (Rothstein & Teorell 2008).

government i.e. the efficiency of the institutions (Rothstein & Teorell: 2008; Rothstein 2011; Levi et al. 2009), and hence outcomes of the management of natural resources.⁸ Corruption could hinder enforcement, monitoring and compliance with regulations when public officials are bribed by evaders to avoid responsibility and thus hampering the implementation of environmental policies (Damania 2002; Smith & Walpole 2005; Sundström 2013).

To summarize this theoretical section, there are both factors including motives for compliance at an individual level, which in turn can be depending on group properties such as social norms of trust and reciprocity, as well as contextual factors such as trust in the state and level of corruption within higher enforcement authorities affecting compliance. The field is further rather developed in terms of what factors that influence people's willingness to comply with rules. However, when applying these theories into the context of a large-scale collective action dilemma over natural resources such as transboundary conservation, the expected outcomes could be more uncertain due to some inherent structures in large-scale commons. In the next section, I will discuss and develop my argument why compliance by resources users could be harder to achieve in transboundary conservation, and thus why this needs to be investigated further.

Compliance in a large-scale collective action setting

Previous theories on what factors that influence resource-users' willingness to comply with conservation rules are to a large degree based on field-studies in small to medium-scale common-pool resources. However, when scaling up from small-scale to large-scale collective action the outcomes of these theories are not equally evident. I argue that this is due to several aspects that are inherent in large-scale collective action regimes over wildlife and natural resources such as transboundary conservation, relating to resource characteristics, resource users' characteristics, the external environment and institutional arrangements (Gibson et al. 2005:274).

⁸ In this study, I'm referring to small-scale corruption i.e. petty or collusive corruption, when bribes are given to enforcement officers to avoid sanctions or penalties from illegal activities. Grand or non-collusive corruption concerns when people must pay bribes to receive e.g. public services, documents or permits, which they are legally entitled to without having to pay bribes (see for example Smith et al. 2003).

Firstly, according to previous research, making resource users follow rules is facilitated through the resources having well-defined boundaries (Ostrom 1998:2) since this lowers the monitoring costs and makes it easier to gather information on the resource stock (Ostrom 2005:261). In contrast, transboundary conservation comprehends fugitive wildlife that straddles over political borders – hence the boundaries of the wildlife are hard to define and enforce. Resource users are then only able to regulate a smaller part of the larger-scale common. This could make them lose their incentives to restrict their own use of the resources since other people from outside can extract from the resources. The overharvest could then also be intensified as resource users lack information about the resource stock and are thus not able to determine a sustainable harvest of the resource (Dietz et al. 2003:1908; Ostrom 2005:283).

Secondly, transboundary conservation between several countries includes a high number of resource users with a variety of interests and identities; factors that have been argued to lower compliance with conservation rules since mitigating prospects for creating and maintaining shared norms of trust and reciprocity (Ostrom 1999:281). Here, face-to-face communication and dense social networks are important factors in building shared norms between resource users and hence inducing rule compliance (Dietz et al. 2003:1908). I argue that establishing social norms concerning resource-use would be difficult in transboundary conservation when resource users that manage the same resource, are spread over countries, making social interactions harder to achieve. This could then make it more difficult for state authorities generating voluntary compliance by resource users in transboundary conservation.

Thirdly, transboundary conservation comprehends several partner countries which could diverge on social, economic and cultural contextual factors. Hence, the same rules could have different effects on the management of wildlife and natural resources depending on these variations in contextual factors (Agrawal 2002:45). This in turn raises questions of how these contextual disparities affect the incentive structure for resource users to comply with rules when sharing and managing the same resources.

Fourthly, previous research have found that excluding outsiders at a relatively low cost is essential for people to follow rules. Outsiders usually lack an understanding of the local rules inducing illegal activities which would make other people participate in rule-breaking when not being able to deter free-riding behaviour (Dietz et al. 2003:1908). In transboundary conservation, I would argue that since there are open political borders, people from other

countries could easily go into other countries for illegal harvest and then return to their country – making it hard for people to exclude outsiders. Hence, since locals would be lacking the capacities to exclude outsiders this give them no incentives to restrict their own use (Agrawal & Gibson 1999:640).

Finally, these aspects points toward the importance of involving a higher third-party with the ability to enforce rules, information sharing and monitoring. This in turn brings in the second level of complexity of achieving compliance by resource users in this large-scale setting. Transboundary conservation could be regarded as a multilevel system of institutions comprehending several different actors from communities to public agencies, on different levels i.e. from local, and national to regional and international (Duffy 2006:92). This large number of participants increases the difficulty of organizing, agreeing and enforcing common rules (Ostrom 1999:281). In other words, acting collectively on conservation towards a common goal could be a collective action problem itself. More people needs to be consulted at different levels and over borders and consensus between these actors must further be reached on all decisions, compared to the management of small-scale commons within one single country (Muchapondwa & Ngwaru 2010:5; Ostrom 1999:278). Hence, I argue that if collaboration is not achieved within higher institutional levels, there is a risk of imposing different constraints on resource users e.g. different rules from state authorities, eroding prospects for large-scale collective action over wildlife and natural resources in the region.

Following these insights, there is a lack of understanding how theories on compliance perform and function when scaling up to a setting such as transboundary conservation, with many resource users and where the need of a third-party involvement is salient. Hence, I argue that to understand how large-scale collective action can be achieved one needs to acknowledge how and what factors that influence resource users' willingness to follow conservation rules. Considering that there are many environmental problems that are of global character, this is a triggering and relevant issue that needs more in-depth analysis. These insights are the ground pillars for the research questions and aim of the study, which will be outlined in the next section.

Aim and research questions

Following previous research, our understanding of which factors that generate compliance with conservation rules in reaching large-scale collective action over wildlife and natural resources is underdeveloped, both theoretically and empirically. The overall aim of the study is thus to examine how and why different factors influence compliance with conservation rules by resource-users in large-scale collective action settings such as transboundary conservation. Thus, the study is based on the following questions:

- *How is compliance by resource users achieved in large-scale collective action dilemmas such as transboundary conservation?*
- *What are the causal mechanisms at work in realising compliance with conservation rules by resource users in large-scale collective action dilemmas such as transboundary conservation?*

In order to realise this aim, I first examine the effect of two factors i.e. trust and corruption, that have previously been identified as important for compliance, on a proxy measure for rule compliance – in this case deforestation on a local level. Thereafter, since there is both an empirical gap and theoretical uncertainties concerning how compliance can be reached in a transboundary conservation, in a next step I use the unique expertise by elite officials and key stakeholders to explore this issue further.

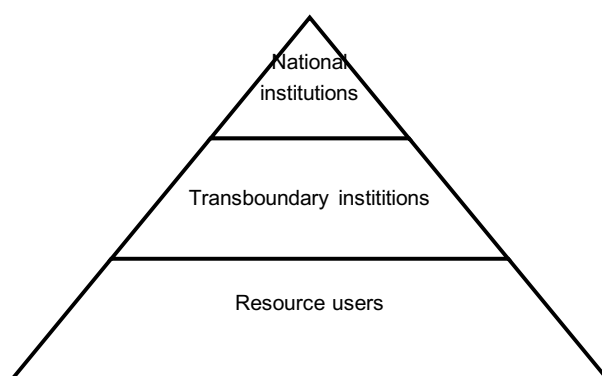
Method and data

In this section, method and data of the study will be outlined and discussed. The first part describes the empirical case and research design of the study. The next section focuses on the quantitative analysis, discussing method and data, followed by a discussion of the qualitative analysis on the same issues.

The case of KAZA TFCA

The empirical focus of this study is the Kavango Zambezi (KAZA) transfrontier conservation area (TFCA) located in southern Africa - a region where the concept of TFCA's have grown rapidly with 18 parks established or in the development stages (SADC 2012).⁹ Situated in the Okavango and Zambezi river basins, the KAZA TFCA is the world's largest transfrontier conservation area with the size of France (520.000 square kilometres) and a collaboration between Angola, Zimbabwe, Zambia, Botswana and Namibia (KAZA TFCA MIDP 2015:10) (see map in Appendix). The park was formally established in 2011 with the overarching goal "[...] to sustainably manage the Kavango Zambezi ecosystem, its heritage and cultural resources based on the best conservation and tourism models for the socio-economic well-being of the communities and other stakeholders in the region." (KAZA TFCA MIDP 2015:2). Except for each country's national actors, KAZA TFCA includes its own organisation with the Ministerial Committee, the Committee of Senior Officials, The Joint Management Committee, the National Committee and finally the Secretariat which is responsible for the day-to-day operations in the region (ibid:14). This organisation scheme of KAZA TFCA is illustrated in figure 1.

Figure 1. Organization scheme



Comment: Organisation scheme over KAZA TFCA and the different actors within the project.

⁹ These TFCAs are at different implementation stages, and are further divided into three categories: Category A: TFCAs with a treaty or other form of legally binding agreement. Category B: TFCAs with a MoU agreement. Category C: TFCAs at a conceptual stage. The KAZA TFCA belongs to Category A (SADC 2012).

Covering an immense area, the TFCA includes a variety of land uses with 20 National Parks, 85 Forest Reserves, 22 Conservancies, 11 Sanctuaries, 103 Wildlife Management Areas and 11 Game Management Areas (ibid:10). Furthermore, there are up to date about two million people living within the area. This high population density, together with high poverty levels and an abundance of different wildlife species e.g. Africa's largest elephant population (250.000 elephants), have caused increasing levels of human-wildlife conflicts especially where unprotected areas is adjacent to protected areas (ibid; Peace Parks 2016).¹⁰ Furthermore, even though there are no official numbers, the Master Integrated Development Plan of KAZA TFCA, states that poaching is prevalent in several areas of the region (KAZA TFCA MIDP 2015:22). To summarize, the region encompasses many people as well as an abundance of wildlife straddling over a large-spatial area between five countries, making it hard for people to exclude other users from the consumption of wildlife and natural resources. In the same time, the KAZA TFCA comprehends actors at different governance levels, both transboundary, national and local actors with their own policies aiming at together governing wildlife and natural resources over borders. These aspects illustrate the large scale collective action dilemma of how state authorities could make people comply with conservation rules in reaching a sustainable use of wildlife and natural resources; which is the focus of this study.

Overall, the case study approach was chosen since complex phenomena can be investigated in its real-life context while at the same time data collection and analysis are guided by previous theoretical propositions. In other words, the case study is used to cover contextual conditions that are thought to affect the phenomena in centre of the study (Yin 2009:13). This makes it suitable for this study since I believe that there are several conditions inherent in the structure of transboundary conservation that make it harder to achieve compliance by resource users. A case-study thus makes it possible to disentangle how previous identified factors of compliance perform in this context. This case should thus be viewed as a “critical-least-likely-case”, when testing previous theories on compliance in a complex context i.e. a large-scale

¹⁰ Human-wildlife conflict refers to the interaction between wild animals and people resulting in negative consequences for either the people and their resources or for the animals and their habitats. This is usually due to increased human populations interfering with wildlife territory, leading to a competition over scarce resources, generating destroyed crops, injuries or risks of both peoples' and animals' life (KAZA TFCA MIDP 2015).

collective action setting. In other words, if the results would still follow the expected outcomes, this would strengthen the theories since the suggested factors still seem to have an effect in a rather unfavourable context (Esaiasson et al. 2012: 163). Furthermore, in relation to other transboundary regimes, for example so called “Transboundary Parks” (TP), where two countries collaborate over borders including only two national parks (SADC 2012), one would expect it to be harder in KAZA TFCA to make people comply, with more actors and different protection regimes involved. Finally, it should be highlighted that this is still a case-study and to strengthen the results and increase the external validity, testing the same theoretical model in other cases of large-scale collective action over natural resources is needed.

Research design

The empirical analysis of this study applies a mixed-method design i.e. both a statistical analysis as well as a qualitative analysis. In other words, to get a more complete picture of the subject and to bring robustness to the results of the study, I treat the different methods separately although taking both results into account when drawing conclusions of the study i.e. a convergent parallel design (Creswell & Clark 2011:70). This design was chosen for several reasons. Firstly, the statistical part examines to what degree levels of trust and corruption in state authorities influence rule compliance within KAZA TFCA and is thus theory-testing when applying previous identified drivers of compliance from theory and testing them on an empirical material (Esaiasson et al. 2012:40). The reason for including this statistical part is then to investigate whether these factors influence compliance in large-scale collective action regimes such as KAZA TFCA. Compared to the qualitative data, the statistical analysis can detect patterns over time and over a larger unit of analysis increasing the external validity of the results of the study (ibid:346). Hence, the statistical data could capture local variations in corruption and trust, not possible using solely interviews. However, with the best data available, the statistical analysis is only able to examine a potential causal relationship between *two* previous identified factors of compliance hence giving a rather narrow perspective on rule compliance in transboundary conservation.

In contrast, the second part of the empirical analysis, applies a qualitative approach based on interviews with elite officials and key stakeholders operating in KAZA

TFCA. Since there is a lack of studies examining compliance in large-scale collective action over wildlife and natural resources, focusing solely on statistical data and operationalisations based on previous known phenomenon this could leave out valuable data in terms of mechanisms that has not previously been identified in theory. Qualitative data is in this way suitable when exploring a new phenomenon and where, as in this case, the context plays a central role in the study (Marshall & Rossman 2016:101,161). Finally, while the statistical analysis focuses solely on compliance with rules concerning deforestation, the interviews highlight compliance with rules also linked to wildlife. Including both types of resources is important for the study since research have found that the physical characteristics of the resource such as degree of mobility increase resource users cost of gathering information about the resource, coordinate benefits from the resource and ability to exclude others from extraction of the resource (Schlager et al. 1994:295). In other words, different resources could generate different incentive structures for rule compliance by resource users. Overall, together the quantitative and qualitative perspectives allow a broader picture of the phenomena of the study.

Statistical regression analysis

The first part of the empirical analysis consists of a statistical regression analysis. This part tries to detect to what degree levels of corruption and trust in state authorities influence compliance with conservation rules, and more specifically forestry rules. The choice of including solely these factors into the statistical analysis is based on data availability and how well factors can be captured through statistical data. Since the dependent variable is on a continuous scale and not dichotomous, an OLS regression is suitable to test the relationship instead of a logistic regression (Field 2013:265). Thereby it is possible to test a linear relationship between an independent and dependent variable, where one assumes causality between them (ibid:210). The unit of analysis is all counties (or the corresponding second administrative level) from each country identified to be located within or partly within the boundaries of KAZA TFCA - in total 30 counties. This in turn includes 616 respondents from the Afrobarometer from where the data on the independent variables derives from. The variables from the Afrobarometer are then

aggregated to the county-level by taking the mean of the respondents' answers in each county.¹¹ Regarding the dependent variable i.e. deforestation, a percentage change in tree cover loss for the time period 2011-2015 is calculated from the original data loss in hectare for year and county.¹² The independent variables cover the years 2008/2009 while the dependent variable is from 2010 and onwards. In this way, the hope is to better show cause and effect rather than to simply test the correlation between the variables.

Having such a low number of units of analysis with some counties only including 8 respondents, is evidently a limitation of the study affecting the statistical power of the results and possibilities for generalizing the results. Furthermore, Angola has not been surveyed in the Afrobarometer and is thus not included into this analysis. Even though a weakness, excluding Angola could be an even tougher test for the theories of compliance, since Angola suffers from higher levels of corruption in relation to the other partner countries (Transparency International 2016). If for example, levels of corruption influence tree cover loss when excluding Angola, this would give some further robustness to the results. Altogether, the statistical analysis has several weaknesses concerning both internal and external validity. In turn, I have decided to only test for bivariate correlations. However, this is the best statistical data available for the region of KAZA TFCA that captures resource user's compliance with conservation rules. This could thus be viewed as a first step in measuring compliance in the region of KAZA TFCA, which could be complemented further when data with a higher coverage and reliability is available. Following this, the validity of the results from the statistical analysis is evidently depending on how well the theoretical concepts can be operationalized and measured (Aneshensel 2013:24). This will be outlined and discussed below for the variables included in the analysis.

¹¹ To make the individual data from the Afrobarometer correspond to the data of the dependent variable each respondent has been geo-located to the second administrative level they live in. This strategy is then based on the assumption that attitudes in the Afrobarometer could capture the general attitudes by the resource users in each county.

¹² This calculation is based on the extent numbers of tree cover in hectare for the year 2010 for each county.

The dependent variable

The dependent variable in the statistical analysis is compliance with forestry rules, which is operationalized as deforestation. This is measured by using percentage change in tree cover loss for each county located within or partly within the boundaries of KAZA TFCA for the time-period 2011-2015. The data was provided by the organisation Global Forest Watch (GFW), although deriving originally from satellite imagery by Hansen et al. (2013).¹³ Percentage change in tree cover loss is thus meant to function as a proxy for compliance with forestry rules. If people choose not to comply with forestry rules and hence harvest timber illegally, this would increase deforestation rates.¹⁴ Thus, counties with a low percentage change in tree cover loss are regarded as having higher levels of compliance with forestry rules, while high percentage change in tree cover loss signals low levels of compliance.

Applying an outcome variable to capture compliance both has its downsides and strengths. Validity problems increase with the distance between the theoretical definition and the operational indicator (Esaiasson et al. 2012:59). Hence, using an outcome variable as dependent variable increase the risk of omitted variables. However, by applying an objective outcome measure such as satellite imagery, the analysis captures the actual consequences of not adhering to rules. Many studies within the field of compliance use people's willingness to comply with rules as a measure for rule compliance (Sundström 2016). Although being closer to the theoretical definition, stated intentions do not necessarily correspond with actual behaviour. Considering this, the choice of using deforestation as a proxy for compliance with conservation rules is still considered valid.

¹³ The data on tree cover loss is not equal to 'net change' in tree cover since the data does not account for tree cover gain. However, the gain numbers are very small in relation to numbers of tree cover loss, and would probably not change the results if included in the regression analysis. In addition, according to Global Forest Watch, the methods for data collection of tree cover loss can vary for each year which could influence the internal validity of the results.

¹⁴ Although diverging to some extent between the countries, in general, harvesting of trees either demands a specific license or is totally forbidden concerning several 'classified' species of trees within national parks and forest reserves in KAZA TFCA (see Jones 2008). Still, counties could be in an area where harvest of trees is legal, which would then affect the validity of the results. This is something that should be considered when drawing conclusions.

The independent variables

The data for the independent variables derives from the Afrobarometer round 4 2008/2009 (Afrobarometer 2017).¹⁵ To capture trust in higher authorities and level of corruption, I apply items used by Wig & Tollefsen (2016) and Knutsen et al. (2016) whom have used these as a measure of local quality of government. Hence, the following items are included into the statistical analysis:

- Trust in local politicians: This is measured through the question “*How much do you trust each of the following or haven’t you heard enough about them to say?: Your Elected Local Government Council*” with responses ranging from 0 to 3, where 0 equals “Not at all” and 3 equals “A lot”.
- Trust in courts: This is measured the same way as trust in politicians, applied to courts.
- Corruption of local politicians: This item is based on the question: “*How many of the following people do you think are involved in corruption, or haven’t you heard enough about them to say?: Your Elected Local Government Council*” with responses ranging from 0 to 3 where 0 equals “None of them” and 3 equals “All of them”.
- Corruption of police: This is measured through the same question as corruption of local politicians, applied to the police.

Qualitative analysis

Since research is lacking on how factors influence compliance with conservation rules in a large-scale setting the best way to explore these issues further is to talk to people through interviews (Esaiasson et al. 2017:263). In this way, the risk decreases of leaving out dimensions that could not be understood in beforehand from theory. Together with three other researchers, I participated in a field trip to KAZA TFCA. Hence, 15 interviews with elite officials were conducted between the 30th of January and the 5th of February.¹⁶

¹⁵ The respondents in the survey are stratified and sampled on the first administrative level meaning that the second administrative level, which is the unit of analysis in the statistical analysis, is not representative of the respondents. However, this is the best available data there is for these African countries, making it suitable to use in this study.

¹⁶ An overview of the interviews regarding country and date can be found in Appendix.

Sampling of interviewees

The interviews are based on the knowledge and expertise from elite officials working within KAZA TFCA. Interviewing elites has many advantages when valuable information can be gained due to their knowledge on management systems, legal and organisational structures as well as the future and history of the organisation (Marshall & Rossman 2016:159). The interviewees were then chosen based on centrality. In other words, since the elite officials are responsible for conservation projects within the region, with tasks encompassing the coordination, facilitation and implementation with conservation projects they are assumed to possess information and expertise about the field of study. Through two people living in the region whom are involved in the research project, the interviews included both people positioned within different state departments and NGO:s, working within different fields of conservation such as community involvement, tourism, conservation of wildlife and natural resources and law enforcement.

The structure of the interviews

The interviews were semi-structured meaning that an interview guide covering different themes were prepared in beforehand, including open-ended questions enabling the interviewee to talk freely about issues.¹⁷ In this way, new ways of understanding the themes or other mechanisms that could not be assumed in advance was possible to capture in the interviews. Furthermore, since the elite officials varied in their expertise in specific areas specific themes were more discussed in some interviews compared to others. Other questions were also added as more interviews were done when new aspects occurred that could not have been understood in beforehand. The structured themes in the interview guide were connected to the questions and aim of the study, relating to previous research within the field of collective action over natural resources i.e. international collaboration between the states such as policy harmonisation; national institutions and differences in bureaucratic capacities; local level cooperation such as the role of trust; enforcement strategies; monitoring and evaluation of conservation effectiveness; and the goals and challenges of KAZA TFCA.

¹⁷ For the complete interview guide see Appendix.

To make the elite officials more inclined to participate in the interviews, they were all informed about the research project, the purpose of their participation, and what kind of topics that they would be asked during the interview, which is in line with recommendations when interviewing elite officials (Lilleker 2003:2009). They were also ensured that their participation would be anonymous and that the interviews would be used solely for scientific use. The interviews were held in English, which is the official language for all the countries visited, thus no third-party in terms of an interpreter was present during the interviews. All the interviews except for one was performed with a record device, decreasing the risk of errors when transcribing, and hence ensuring the reliability of the material. In some interviews, all the researchers participated, while others were done in pair or with one researcher solely. The interviews varied in length although most interviews lasted for about one hour.¹⁸

Reliability of the interviewees

Following the interviews, I believe all informants to be trustworthy in their answers. However, since these interviews can be considered elite interviews the interviewees could be very skilled in choosing an appropriate narrative when discussing different themes which could lower the credibility of the information (Marshall & Rossmann 2016:159). It could be the case that these elite officials would feel a resistance against revealing potential obstacles with implementation of different conservation programs not wanting to discredit KAZA TFCA as a project or their field of responsibility. To increase the credibility of the results, we tried to make sure that themes were critically examined during the interviews by being prepared and well-informed on the subjects and region, following up different kinds of reasoning with further detailed questions and critically discussing different issues. However, in general, the elite officials talked rather openly about issues and potential obstacles with making people support and follow conservation rules – increasing the credibility of their considerations.

¹⁸ The analysis of the interviews was done in several steps. Firstly, the interviews were transcribed and thereafter read through to get an overview over them and comments and key words were written in the margin as a first stage of interpreting the material. The second step concerned coding quotes that were connected to and could explain rule compliance hence being able to disentangle similarities and patterns between the informants as well as making cross-references. Thereafter, a work of trying to build a consistent picture of what factors that influence compliance and potential mechanisms was done.

Limitations

Even though the elite officials were strategically sampled, one cannot exclude the possibility that additional interviews would have illuminated new elements relevant for this study. Furthermore, there is a risk of missing out on important aspects when the material is based on elite official's expertise on resource user's willingness to comply; hence not based on the experiences of resource users' themselves. This is considered a valid critique of the material. However, interviewing resource users in the region would have demanded a specific permission from higher authorities implying more time and resources which was not possible in relation to the time-frame of this study. Hence, considering the in-depth knowledge that the elite officials encompass over the field, this is still regarded as a valid approach for the study.

Results

Results from the quantitative analysis

This section presents the results from the statistical analysis. In Table 1 the descriptive statistics of all the variables is shown. The results are then presented in Table 2 including four different models. Since the data is already limited in its scope and comprehend issues concerning reliability, the models only consist of bivariate correlations.¹⁹

Table 1. Descriptive statistics of the variables

	N (Counties)	Mean	Sd.	Min.	Max.
Forest loss 2011-2015 (%)	30	0.336	0.343	0.032	1.344
Corruption local government	30	1.10	0.310	1	2
Corruption Police	30	1.53	0.510	1	2
Trust court	30	1.00	0.525	0	2
Trust Police	30	1.23	0.504	0	2
Trust local government	30	1.57	0.504	1	2

¹⁹ See Appendix for correlation matrix of all the variables.

In model 1 the bivariate correlation between corruption within the local government and tree cover loss is tested, showing a positive correlation with a beta-coefficient of 0.251. However, the effect is insignificant and the R^2 is very low (0.050) implying that the fit of the regression model is very low. Model 2 test the relationship between the independent variable corruption within the police and the dependent variable percentage tree cover loss i.e. deforestation for the period 2011-2015, finding a positive relationship with a beta-coefficient of 0.321 and the effect is significant at the 99 percent level. Hence, one unit increase in corruption among the police show a 0.321 percentage deforestation over the period 2011-2015. The R^2 is rather high (0.226) meaning that 22.6 percent of the total variation in the dependent variable deforestation can be explained by corruption within the police. In model 3, the relationship between trust in the court and deforestation is tested, finding a positive effect with a beta-coefficient of 0.304. The effect is further statistical significant at the 99 percent level. Hence, one unit increase in the independent variable show a 0.304 percentage deforestation for the period 2011-2015. Since the variables of trust are recoded to facilitate the interpretation of the results a one unit increase in the independent variable means less trust in the court. The R^2 of model 3 is somewhat lower than in model 2 when 21.7 percent of the variation in the dependent variable deforestation can be explained by trust in the court. Finally, model 4 tests the effect between trust in the local government and deforestation. Yet, the effect is insignificant with a low R^2 hence the fit of the regression model is very low.

Table 2. OLS Regression analysis of the relationship between trust, corruption and compliance with forestry rules.

Dependent variable: change tree cover loss 2011-2015 (%)

	Model 1.	Model 2.	Model 3.	Model 4.
Corruption Local Government	0.251 (0.207)			
Corruption Police		0.321*** (0.112)		
Trust Court			0.304*** (0.109)	
Trust Local Government				-0.011 (0.175)
Intercept	0.059 (0.236)	-0.156 (0.181)	0.032 (0.123)	0.353* (0.211)
R ²	0.050	0.226	0.217	0.000
N (Counties)	30	30	30	30

Source: Afrobarometer round 2008/2009; Hansen et al. 2013. Comment: Standard Error in parentheses, significant level: ***p<0.01, **p<0.05, *p<0.1. To make the results easier to interpret, the variables concerning trust i.e. "How much do you trust each of the following or haven't you heard enough about them to say?; Your Elected Local Government Council/Court" were recoded were 0 equals "A lot" and 3 equals "Not at all".

Summarizing the results, both corruption in the police and trust in the court indicated statistical significant results at the 99 percent level with high R². With the assumption that attitudes in the Afrobarometer capture the general attitudes by the resource users in each county, the results give some support to previous theories i.e. resource user's lowered trust in state authorities as well as increased levels of corruption among public officials could mitigate levels of compliance with forestry rules. However, these results do not give any insights concerning how the real deforestation numbers in hectare differ between the counties. The statistical analysis is further only able to confirm a correlation and a potential causal relationship with the risk of leaving out omitted variables. To capture a more developed picture of how compliance can be achieved in large-scale collective action over wildlife and natural resources, qualitative data is needed. In the next section, the results from the interviews will be presented.

Results from the qualitative analysis

The following section illustrates different factors impact on compliance within KAZA TFCA and why these factors would influence resource-users' willingness to comply with conservation rules. Although this study is not able and neither aiming at detecting how common rule-breaking is in the region, following the interviews, it becomes evident that rule breaking in terms of poaching of both wildlife and natural resources is a challenge facing KAZA TFCA. There are further mainly two different types of poaching apparent in KAZA TFCA: poaching for subsistence needs such as fishing, harvest of trees or hunting for the livelihoods of the locals, and commercial poaching of ivory where poachers either come from outside or where locals are paid by actors connected to the ivory market to hunt elephants and rhinos for their trophies. Based on the descriptions from the interviewees, the following factors connected to compliance was identified:

Compliance due to trust in state authorities

Relating back to previous theories, a uniform picture from the interviews emerges suggesting that resource user's trust in state authorities plays an important part in reaching voluntary compliance with conservation rules in KAZA TFCA, where trust in the state officials in many cases appears to be lacking. State officials are for example acting both as facilitators for conservation as well as the police, arresting people for illegal activities which could decrease the trustworthiness in the state officials. As one elite official describes it:

How would they [the communities] trust us [the state authorities] if we say 'Ok, fine we are partners in this' and there is no system that makes them believe that they are partners? And within the same departments we have people who wear the same uniform, like mine, who go and kick them and put them into jail on massive species of poaching. And then the following day they go and say: 'Let's work together, let's join hands and conserve together'. So, it takes a lot to win that trust. (Interview 3)

The primarily reason for this lack of trust seems to be related to the absence of a functional system of benefit-sharing. To start with, one of the underlying factors regarding why people participate in poaching in KAZA TFCA seems to be poverty. People appear to break conservation rules due to pure subsistence needs or for economic gains from commercial poaching to uplift their livelihoods.

I poach because I'm hungry. I poach because I want fish. I want money. So, at the end of the day, for our natural resources to thrive and not being depleted, we have to address the issue of poverty. Because poverty is the main driver of poaching. (Interview 1)

The interviewees then describe how state authorities such as rangers, law- and wildlife departments would gain trust from people if establishing a system of benefit-sharing in return for people protecting wildlife and natural resources. Benefits refer to material issues that could enhance the livelihood of the resource users e.g. new jobs, building of schools, provision of electricity, or crafts in protecting live-stocks. One elite official describes the relationship in the following way:

If they [the communities] don't see any benefit in whatever you [the state authority] are doing, whether it's research, whether it's community development, it's going to be very hard for them to accept you. But I think it basically comes down to, trying to gain their trust first. You have to gain their trust first and you really have to work hard to explain to them in the simplest terms what they can benefit out of what you are doing and what you want to achieve out of that. (Interview 4)

Since human-wildlife conflicts are common in the region with incidents of people getting their crops destroyed or even harmed themselves by wildlife, the interviews report a situation where there is a lot of anger and frustration involved when people are being told to protect the same animals that are causing their properties or even themselves damage. Consequently, it appears that if people trust that they will receive benefits from protecting wildlife and natural resources, this could make people value resources higher and thus have incentives for investing time and resources in conservation.

[...] Because really our task at the moment, as far as wildlife is concerned, is to try and change people's attitudes towards our wildlife, from being... right now it's just a nurturance, it's a liability. We want them to look at wildlife as an asset and for them to see this, they got to have tangible benefits. (Interview 14)

Furthermore, it is interesting to note the role of the temporal factor, when several interviewees pointed out that the benefits need to be provided to the communities within a short period of time for the people to support conservation projects. The interviewees report how people have had high expectations on KAZA TFCA delivering measures through which people could enhance their livelihoods. However, it appears that KAZA TFCA have not fulfilled peoples' expectations when not providing the expected benefits on time which could make them resistant

in supporting conservation efforts. This also seems to be highly related to people being poor and hence not able to wait for their livelihoods to improve.

[...] So that are all of those expectations from the community that we have to manage. It's a serious challenge because they expected so much. They thought KAZA was just going to come in and give them this money to start doing their businesses. (Interview 11)

[...] And with the conservation initiative, the conservation projects, you start getting the results after a long period of time. Them [the communities] they are expecting results tomorrow. They are saying 'Okey, yes now we have KAZA. KAZA has been established now. So, we want to see the benefits now'. So, it is very difficult to go to them and try to tell them that the benefits you are going to see them over time. Because they don't have that patience of time. (Interview 1)

To summarize, it appears that to achieve voluntary compliance, state officials need to establish a credible commitment of trust between them and the resource users. In turn, the lack of trust in the region seems to be related to the transboundary conservation project not having a functional system of benefit-sharing and not delivering these benefits within a reasonable time-frame, combined with low socioeconomic conditions.

Compliance due to co-management

Another challenge that KAZA TFCA face in generating compliance is establishing a functional system of co-management between state authorities and local communities. The interviews describe how the involvement of locals into the management of wildlife and natural resources stretching from consultancy to enforcement of rules and user-rights over wildlife and natural resources is crucial to make people follow rules. For example, the interviews suggest that if people perceive that they are not being consulted before conservation projects are implemented this could make them more resistant against following conservation rules. This appears to relate to people perceiving that they are not being taken seriously and recognised by state authorities when their opinions and knowledge is being rejected.

Because you have to involve the community and show them that you take them seriously. If you come with a decision from the top, they'll most likely reject it or they don't give you any support. Most of them understand exactly what you're [the state authorities] trying to do and they know there are likely benefits of that but they are still resisting because they were never consulted. (Interview 4)

People come to the communities and tell them what to do, instead of getting their ideas [the communities] on how they need to deal with certain issues. And communities become very resistant because now they are not part of that, they are told what to do. (Interview 2)

Furthermore, the interviewees also mention the importance of people having ownership and access to wildlife and natural resources when affecting how inclined people will be to follow conservation rules. Involvement into the management process which could be both involvement in terms of user-rights as well as the mandate to monitor resources themselves, could then give people incentives to protect the resources and hence adhere to conservation rules.

Initially when you bring together communities and tell them that: 'We are giving you the custody or the authority to be the custodians of this resource. This resource belongs to you and it is you to decide how you are going to manage it.' And then it is that ownership, that this thing is ours. And then they manage it properly. But when you take everything from them and give back to them a law, they always become very radical to an extent that every time they see that resource they exploit it. (Interview 1)

If you are not given an incentive - why should I conserve and for who? So, if you are not allowed to cut timber I will still cut it and even overharvest and use the wrong methods. Because I'm doing it behind your back and this resource is the government's and I don't care. (Interview 3)

Connected to this, the interviewees reported that a key entry point to make local communities follow conservation rules is for the state to establish co-management with traditional authorities in the region. In some of the partner countries communities are governed on a local level by traditional laws enforced by traditional leaders i.e. the 'chiefs'. In turn, these traditional authorities appear to have high legitimacy among people when taking the local perspective into account as well as being in-charge during their whole life-time.

For me, a key entry point into the communities would be through the traditional leaders. That is the key. Because when they speak with their subjects they listen. They listen to them because those traditional leaders they are always there. They are different from maybe some political leaders who can come and go. (Interview 13)

It is the traditional authorities who understand the needs of their people. So, in most cases where the traditional authorities are the ones who have the right over land, we have not had any problems in regards to complying with the natural resource policies. But where the state has overruled the traditional authorities and taken control of... issuing the land, we have always seen a lot of resistance and labelling of wildlife. Then wildlife not becomes their resource but becomes a government thing. (Interview 1)

Altogether, these insights suggest that for people to follow rules within KAZA TFCA, they need to be included into the management process over wildlife and natural resources to feel that

they are being acknowledged and taken seriously. These accounts could then be related to previous theories, arguing that people will perceive that they are treated fairly by state authorities when included into management which would increase legitimacy in state authorities (Nielsen 2003; Murphy 2004).

Compliance due to distributional and procedural fairness

Following these insights, these discussed issues connects to previous findings within the literature of compliance. However, one striking factor that expands on previous research relates to the lack of policy harmonisation between the partner countries, which was uplifted throughout the interviews as one of the major challenges for KAZA TFCA. Since the different states have not yet (with some few exceptions) succeeded in establishing common policies on conservation, the region encompasses different rules on how much people can extract from a common resource, where some people are allowed harvesting of resources while others get sanctioned for doing the same. The interviewees then describe a situation where it appears that the inability of excluding others to extract from the resources together with people being highly dependent on wildlife and fishery, makes people participate in the harvesting of the resource even though it is illegal on their side of the border. This is in line with collective action theory on free-riding, when not being able to exclude others from extraction of the resource; this would lower the incentives for cooperation of the resource (Ostrom 1990; Ostrom et al. 2002). A good example concerns the previous lack of harmonisation between fishing season in the region between Namibia and Botswana.

Like you find that during those times people from Botswana would say: 'Why is it like Botswana is saying stop fishing but in the other countries they are fishing in the same resource?'. You didn't give people a lot of sense. But then both partner countries, they stopped at the same time. Now, everything is fine. People are not complaining. Rather people are complying. (Interview 7)

[...] If you are in this side, on the Botswanan side, you see people on the other side in Namibia, and they will be fishing in the same water and here they are not allowed to fish. Then because of that we ended up with people over-harvest or fishing even outside the season - poaching. (Interview 3)

Policy harmonisation could evidently be an issue in all types of global environmental problems with countries having different legislation increasing the risk of free-riding, but in the context of transboundary conservation of wildlife the interviews suggests that this is an especially

salient mechanism. Fugitive resources such as elephants straddles freely over political borders without fences; hence the resource users from one country can see with their own eyes how the animal that they have protected is being hunted and killed by the resource users on the other side of the border. This is a triggering issue in KAZA TFCA since there is a total hunting-ban in Botswana compared to the other countries where hunting of wildlife is allowed.

During dry season, they [the zebras] will come. They will move out to Zalambala. They will go to Namibia. Same zebras! And people [in Botswana] will feel that they have just looked after them, but we can't benefit anything from them – why? (Interview 6).

[...] The borders are open and you know, there is free movement of wildlife. Even we share the rivers, we share the Chobe River. So, we share the fish, we share the wildlife. In Botswana, we have currently banned hunting. But in the neighbouring states it's still open. So, we still have to continue with our mandate of conserving and protecting the species which we still share with them. (Interview 4)

It thus appears that different extraction rules could generate an unfair distribution of benefits between people in terms of incomes from harvesting resources as well as resource users being treated differently by law enforcement authorities working under different legal frameworks. These aspects relate to previous theories of compliance suggesting that unfair distribution of the outcomes as well as unfair procedures would erode legitimacy in state authorities and in the end trust in the state (Sutinen & Kuperan 1999; Levi et al. 2009).

Compliance due to deterrence over political borders

Finally, even though several normative aspects are uplifted as important for voluntary compliance in the region, the interviews further witness of the need to involve deterrence as a measure to mitigate poaching, especially commercial poaching. Poaching of ivory and illegal trafficking of wildlife products were reported as two of the biggest challenges of KAZA TFCA being driven by a global market including a chain of different actors. Hence, since this is an issue of global character, involving people from outside the region, the interviews suggested that other measures need to be considered as well as working at several different institutional levels to mitigate these types of illegal activities.

For communities, incentives will help. Get them involved, let them get more benefit from wildlife, let them help you to protect it. Let them stop poaching themselves. For the international syndicates, that's an international

problem now where you need assistance from various levels of government. That's something that we are grappling with. [...] Now, as long as that demand is there, the supply is going to grow. (Interview 14)

In this sense, though sanctions and surveillance are important measures in mitigating poaching by people coming from outside the region. This is illustrated in the interviews when highlighting how the different legislations between the partner countries combined with poachers being able to pass easily over political borders influence where people for commercial poaching go about spatially.

[...] in Zimbabwe if someone poaches an elephant, he goes to jail maybe for nine years, and then in Zambia it is two or three years. In Botswana, it's another scenario [suspected poachers are shot on sight by the military]. So, it means, when it comes to those illegal activities, these poachers might end up changing from where they are getting higher sentences, targeting where they know that 'If I get caught, I'll just spend a year or two years and then I'm out.'" (Interview 13)

Again, the harmonisation of policies seems to be an important factor for lowering poaching events in the KAZA TFCA but in contrast to mitigating unfair distribution and procedures, here it would increase the costs of participating in illegal activities. A real challenge is thus to coordinate law-enforcement operations over borders where a functional communication system seems to be essential.

There must be a central point for networking communication and one of the challenges is where there are other incidents, it happens to areas where the departments or organisations within that particular country cannot reach." (Interview 7)

In addition, working over borders in terms of education and capacity-building among law enforcement departments seems to be important in reaching effective surveillance.

The training part is also very important. To share data. So that we train each other and educate each other. Also, in terms of resources. We don't have resources like vehicles, boats for patrolling. Sometimes it's quite difficult because we want to do law enforcement but we don't have such resources. (Interview 10)

In sum, whether the poacher comes from outside the region and whether rule-breaking is connected to the ivory market or more for people's daily livelihoods, deterrence could play an important role in mitigating rule-breaking by people.

Discussion of the results

Following the results from the interviews, several points should be discussed both concerning implications for research as well as for policymakers. To start with, covering such a large spatial area, voluntary compliance with conservation rules by people in the region plays an immense role in avoiding over-harvest of wildlife and natural resources since the deterrence model would demand a high amount of resources and capacities. The results support previous research when reaching voluntary compliance in a large-scale collective action setting seems to be related to establishing trust between state authorities and people in the region. Being ensured a system of benefits in return for people abiding from illegal activities is a factor that in turn could influence trust in state authorities. This argument relates back to social contract theories (Levi & Stoker 2000) since state authorities in KAZA TFCA need to establish a credible commitment that they will provide benefits to people within the region. Benefit-sharing could then be regarded as a potential instrument that can be used in order to increase trust in state authorities. In addition, socioeconomic conditions as an underlying variable is evidently something that needs to be controlled for when examining compliance with conservation rules. Even though people would perceive the rules to be morally right there could be a need to break the rules, when people must put food on the table. The study further supports previous theoretical expectations when co-management between people and higher state authorities seems to increase compliance. It appears that the lack of co-management make people feel that they are treated unfairly by state authorities. Hence, the causal mechanism at work could be unfair procedures through which people are treated by higher state authorities and thus eroding legitimacy in state authorities.

Together, whether people choose to comply or not in KAZA TFCA do not have to be driven by people perceiving the rules as morally wrong or right. Neither the assumption that people are only functioning as self-interested rational individuals always calculating the costs vs. benefits in rule-breaking can function as the only explanation for compliance in KAZA TFCA. Instead, people could have legitimate reasons for not complying with rules when not being provided with a functional system of benefit-sharing and co-management. Hence, instead of only analysing the individual level in understanding compliance in large-scale commons; viewing people as not fulfilling their promises towards the state when not following rules, one should rather acknowledge the structural factor when the states have failed in providing a common system of benefits and co-management – which could erode trust and to some extent

force people to participate in illegal activities. In turn, this highlights the significance of a ‘functional’ third-party actor to make people follow conservation rules and reaching large-scale collective action i.e. the quality of government²⁰ where the lack of an efficient government could for example delay the implementation of policies (D’Arcy & Nistotskaya 2015: 12).

Furthermore, an essential aspect in reaching large-scale collective action over wildlife and natural resources is the temporal factor influencing compliance. The interviewees describe how people living under tough conditions have short time horizons regarding how long they can abide from rule-breaking before new systems, rules and projects are implemented. This points towards the significance of institutional change in reaching large-scale collective action. Institutions are sticky and often remain in place even though there are mismatches between regimes and the socio-ecological system it intends to steer (Young 2010:379). Hence, institutional change is often incremental; while formal rules might change overnight through political decisions, informal rules such as traditions, customs and rules of conduct are harder to change and more resistant to new policies (North 1990:6). As a large-scale management system with actors from different countries including both formal and traditional rules; KAZA TFCA have problems with a lagging effect when the results from the efforts taken by the political elite will probably show at the local level only after some time. Consequently, Sutinen & Kuperan (1999:182) argue that inefficiency in terms how fast higher authorities respond to a given problem erode legitimacy, which could then be the case with state authorities in KAZA TFCA. In this sense, the temporal factor could change the function of the factors vertical trust and co-management in this large-scale setting. For example, slow institutional change (through the differences in formal and informal rules) could make it harder to establish functional systems of benefit-sharing and co-management, which could then lower legitimacy and trust in state authorities mitigating compliance. Hence, theories on compliance by resource users should be expanded acknowledging the effect of the temporal factor in reaching large-scale collective action over natural resources.

Another way of understanding this relationship between provision of benefits, fulfilling expectations and state authorities receiving the support of resources users, could be

²⁰ Although out of the scope of the study, in short, quality of government could involve several components e.g. government effectiveness, regulatory quality and level of corruption. See Kaufman et al. 2009 for a more in-depth discussion.

related to the interesting findings from the work by Kadu & Lieberman (2015). Focusing on African countries, the authors argue that when citizens are being provided with basic public services by the government, expectations are raised upward on the governmental party. Thus, instead of citizens giving the support to the government, citizens cast their vote on other parties if the government cannot fulfil their new 'higher' expectations. In this light, people's resistance against conservation projects in KAZA TFCA can be understood to some degree. The whole project has been promoted with the goal to uplift the livelihoods of the communities, which in turn could have increased the expectations of KAZA TFCA as a provider of benefits. Hence, as people's higher expectations are not fulfilled they could become less supportive of rules. Whether this is the case or not in KAZA TFCA, it is an important perspective to investigate further in the field of large-scale collective action as the vertical relationship between the state providing public services and receiving support from people does not seem to be that evident as one can assume.

Equally important is the role of local institutions in reaching large-scale collective action over wildlife and natural resources, which are in line with an emerging literature focusing on the role of local political institutions in Africa on different welfare parameters (see for example Wig & Tollefsen 2016; Knutsen et al. 2016). The results from the statistical analysis give some support to how people's trust in local authorities as well as how corruption in local authorities could erode compliance with forestry rules. Hence, the variation in local institutions in terms of informal norms of trust in local authorities as well as corrupt behaviour among public officials could play a part in reaching large-scale collective action when eroding compliance. This also concerns the legitimacy of traditional authorities. Although a debated field on the relationship between democratic leaders vs. traditional authorities²¹ the interviews describe how traditional authorities seems to have high legitimacy by the local communities; thus, being an important link between state authorities and resource users.

The study further expands on previous research when illustrating how the management over large-scale commons such as rivers, wildlife and habitats straddling over political borders, compared to small-scale commons, demands a coordination between law enforcement departments as well as harmonisation of policies over political borders. Otherwise,

²¹ See Logan 2009 for an in-depth discussion

there is a risk of inducing free-riding among resource-users. Free-riding is not only a threat for the sustainability of wildlife, forestry and fishery stocks but could also intensify rule-breaking. If some people can get away with poaching or as in the case of KAZA TFCA, where some people can extract from the common resources while others cannot, according to Kuperan & Sutinen (1998:330), this could erode morality among people, when the regulation is perceived as unfair and further not effectively protecting the resources, making people legitimise them also extracting from the common resource. This unfair distribution of benefits and unfair procedures through which rules are implemented would then erode the legitimacy of state authorities (Tyler 1990; Sutinen & Kuperan 1999). Hence, the management system should be consistent rather than flexible over political borders. Thus, in a large-scale collective action setting, the different state authorities need to be aware of the consequences of rules in relation to distribution of benefits from the resources to the resource users as well as procedural fairness by enforcement authorities. Hence, previous theories should be developed on how the differences in formal extraction rules between states could cause free-riding among resource users and further gain more in-depth knowledge on the causal mechanisms at work i.e. distributional and procedural fairness.

Finally, from the results it appears that the effectiveness of deterrence could be dependent on type of illegal activities as well as type of poacher. The combination of wildlife straddling over a large area, together with commercial poaching being connected to a global market of ivory suggests that deterrence in terms of surveillance and sanctions by state authorities is needed. The market for ivory makes people from outside come to the region for poaching of ivory – people whom are not steered by social norms of trust and reciprocity towards other resource-users or trust in the state that would induce voluntary compliance. Monitoring these fugitive resources such as elephants over borders clearly is a costly endeavour relating back to the role of resource characteristics as affecting the role of surveillance and monitoring and the need to involve a third-party enforcer. Regarding stationary resources such as forestry, this would probably be an easier task for local people to monitor while commercial poaching of elephants obviously demands higher enforcement authorities and better capacities for surveillance. In this sense, deterrence might be more important as a complement to ‘softer measures’ in achieving compliance in large-scale commons with fugitive resources and actors

involved whom are not steered by social norms of trust and reciprocity, demanding high monitoring capacities that only the state could provide for.

Together, the results from this study indicate how the linkage of institutions both horizontally and vertically is a fundamental aspect in reaching compliance by resource users and thus achieving large-scale collective action over wildlife and natural resources. Local communities need to be included into the management process and consulted for them to support rules, while at the same time being dependent on higher state authorities in coordination of rules, enforcement, surveillance and provision of benefit-sharing systems. Furthermore, as in the case of KAZA TFCA, large-scale collective action over wildlife and natural resources includes not one, but several different state authorities. This study has shown how essential the coordination and collaboration between state authorities are in terms of policy harmonisation and effective law enforcement, which could influence resource users trust and legitimacy in state authorities and their perceived risks of participating in illegal activities. Furthermore, the emergence of social norms of trust and reciprocity between resource users are harder to achieve due to the large spatial distance thus, linking communities horizontally over borders who share the same resources – through forums or workshops is also a way forward in reaching large-scale collective action.

Overall, this relates to the theoretical idea of polycentric systems i.e. systems that comprehends multiple governing authorities at different scales, from local to international which are nested in one another, as a way of dealing with ‘global’ environmental problems (Ostrom 2010:552; Mansbridge 2014:10). The challenge lies in as Schoon (2013:426) states “[...] how to make the decisions of where and when to scale up”. In this sense, policy-makers needs to pay bigger attention to adaptive governance when dealing with resources that demand large-scale collective action i.e. building a functional system that promotes institutional diversity (recognising both formal rules and organisations as well as informal norms and practices), the exchange of ideas and knowledge, the building of trust through repeated interaction, and a strong leadership (Schoon 2013; Ostrom 2010). Transboundary institutions could in this way function as facilitators in creating forums for information-sharing, capacity-building and consultancy both between state departments as well as between resource users in different countries. Hence, although there are many challenges in generating compliance over

large-scale common-pool resources there are also several opportunities when possible learning effects and collaborations over borders can be facilitated through transboundary organisations.

Generalizability of the results

Being a case-study one should further reflect on how the findings from this context could be applied to other settings. Is it possible to apply the results to other types of large-scale collective action dilemmas such as taxpaying or issues relating to climate change? Following the results, the context of this case could limit the extent to which the findings could be generalized since socio-economic conditions play a great part in making people follow rules. Thus, moving to a setting where socioeconomic conditions would be different might lead to other findings. Nevertheless, I would argue that many large-scale collective action dilemmas comprehend the same inherent structures as transboundary conservation such as a many heterogeneous users with a large-spatial distance between them, being dependent on a third-party actor that could ensure compliance with rules. In this sense, some of the factors identified here could potentially be found in other settings of large-sale collective action as well. Although, these questions could only be answered through further studies in other contexts.

Concluding remarks

To conclude, the overall aim of the study was to identify how and why different factors influence compliance with conservation rules by resource-users in large-scale commons such as transboundary conservation and thereby understanding how large-scale collective action can be achieved. This study has shown that both previous factors related to the normative strand as well as factors of the deterrence model are important in reaching compliance in large-scale commons, while also providing insights into how other dimensions could influence compliance in a setting of large collective action such as transfrontier conservation schemes.

Compared to the qualitative part, the statistical analysis can identify patterns in and how the local variation in trust and corruption could have implications in achieving large-scale collective action. The study give some support to previous theories that corruption and

trust in local authorities could impact levels of compliance in transboundary conservation since lowered trust and increased levels of corruption generated increased deforestation in KAZA TFCA. Hence, dealing with large-scale commons that stretches over several states and thus a variety of local political institutions, could demand different compliance strategies depending on local variation in trust and corruption. However, these results need further confirmation through data with better coverage and reliability. Nevertheless, the qualitative analysis supports some of the findings from the statistical analysis and previous expectations that vertical trust, in this case through the establishment of benefit-sharing, is important in reaching voluntary compliance in this large-scale setting. Furthermore, co-management between state authorities and local communities also appears to be essential for compliance by resource users. The qualitative part further suggest that the function of these factors could be somewhat different in transboundary conservation. Slow institutional change through the divergence between formal rules taken by state authorities and informal norms and traditional customs could make it harder to establish functional systems of benefit-sharing and co-management, which could then lower trust in state authorities mitigating compliance. Hence, theories on compliance by resource users should be expanded acknowledging the effect of the temporal factor in reaching large-scale collective action over natural resources. What is equally important to highlight is how socio-economic conditions affect people's willingness to follow rules. Even though people perceive rules as morally right, they might be forced to participate in illegal activities because of their subsistence needs. Overall, instead of viewing individuals as not fulfilling their promise towards the states when breaking rules, policy-makers need to acknowledge structural factors as drivers of rule-breaking by resource users in transboundary conservation – when the states have not yet fulfilled their promise on delivering a functional system of benefit-sharing and co-management.

In contrast to small-scale commons within one community or country solely, reaching large-scale collective action in transboundary conservation demands a coordination and harmonisation of policies between countries. Otherwise conflicts can arise due to different distribution of benefits from the resources and people perceiving that they are treated differently by state authorities, which could erode trust and legitimacy, inducing rule-breaking. Previous theories should thereby expand on how different formal rules in terms of extraction and harvesting of resources between states could cause free-riding among resource users since this

seems to be a triggering issue in transboundary conservation and an obstacle in reaching large-scale collective action. Higher state authorities further need to have the knowledge in the variation in and structure of local institutions such as traditional leaders and rules, since they are important in generating compliance and in the end an effective implementation of conservation projects in transboundary conservation.

Finally, although the study demonstrates that ‘softer measures’ such as benefit-sharing and inclusion of resource-users is fundamental to reach voluntary compliance in large-scale commons, deterrence measures are also necessary. However, this study suggests that the effectiveness of deterrence could be dependent on type of illegal activities as well as type of poacher. In the case of KAZA TFCA, commercial poaching of ivory seems to attract people from outside that are not steered through social norms of trust and reciprocity; hence deterrence might be a more effective measure in this case. Nevertheless, for the deterrence model to be successful, enforcement authorities need to coordinate enforcement strategies horizontally over political borders since differing sanctions between countries together with open borders could make people more inclined to participate in illegal activities traveling where sanctions are lower. Together, this study indicates that the linkage of institutions in terms of consultancy, information-sharing and coordination of rules both horizontally between communities and state departments over borders, as well as vertically between local resource-users and higher enforcement authorities plays an immense role for compliance with rules by resource users and hence reaching large-scale collective action over wildlife and natural resources.

Following the results of the study there are several directions for future research. To increase the generalizability of the results these factors should be further explored in other transboundary conservation areas or other large-scale collective action dilemmas. Overall, this study has not been able to control for differences in contextual factors such as political systems or other aspects of quality of government than corruption, and their effect on compliance which is something that could develop this field further. Future research would also gain a lot from focusing solely on one of the factors identified in the material. For example, the differences in distribution of benefits and procedural fairness through the lack of policy coordination, where research could focus on how cooperation could be achieved between e.g. law enforcement departments. In addition, the statistical analysis suggests that corruption in local authorities might be a salient factor influencing compliance in this transboundary setting. However, this is

a theme that demands its own approach and focus as it is sensitive issue to discuss. Regarding level of analysis, future studies should evidently include resource users and their perceptions on the issue through for example questionnaires in different communities to complement the insights from this study. Finally, finding statistical data with better coverage and reliability is essential to complement the qualitative data to a greater extent and thus being able to track patterns over time and over larger units of analysis.

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Appendix

Map KAZA TFCA



Source: Peace Parks Foundation 2016

Correlation matrix

	Tree Cover Loss & 2010-2016	Trust Local Government	Trust Court	Corruption Police	Corruption Local Government
Tree Cover Loss & 2010-2016	1				
Trust Local Government	-0.016	1			
Trust Court	0.466**	0.261	1		
Corruption Police	0.475**	0.261	0.259	1	
Corruption Local Government	0.224	0.291	0.430*	0.312	1

Source: Afrobarometer round 2008/2009; Hansen et al. 2013. Comment: Standard Error in parentheses, significant level: ***p<0.01, **p<0.05, *p<0.1. To make the results easier to interpret, the variables concerning trust i.e. "How much do you trust each of the following or haven't you heard enough about them to say?; Your Elected Local Government Council/Court" were recoded were 0 equals "A lot" and 3 equals "Not at all".

Interview guide

Title?

Country of origin?

Authority and tasks?

Employment history (how many years and on other positions)?

MOTIVATION/RATIONALE BEHIND KAZA TFCA

- How would you define the overall objective of the conservation area?
 - Some conservation areas focus primarily on biodiversity outcomes, others emphasize other needs more strongly. How do you strike the balance?

INTERNATIONAL COLLABORATION

- What are the main challenges involved in the international cooperation in respect to the TFCA?
- To what extent do the involved states comply with the international agreements?
- Do the involved states benefit to the same extent?
- Do you perceive transboundary conservation initiatives to be more effective than strictly national parks and national conservation? Or more challenging? Why or why not?
- To what extent are the policies of the involved countries harmonized?
 - How do the involved states work towards harmonization of their policies?
 - What are the main obstacles?
- Are all national authorities able to prosecute citizens from the other nations?
- Will a poacher be extradited or tried in the country where the offence is carried out?
 - How do the involved states work towards harmonization of their policies?
 - What are the main obstacles?

THE TFCA AND ITS RELATION TO NATIONAL INSTITUTIONS

- Is the overall enforcement strategy and the capacities for implementing this strategy primarily “owned” by the TFCA or is it rather decided by the respective countries?
- How do the varying strategies and available resources in the different countries affect the overall effectiveness?
 - Is the TFCA more “successful” in some countries?
- Do you feel constrained by national ministries and departments? To what extent do you feel autonomous?
- The master integrated development plan discusses the fact that there is variation in the management and conservation of natural resources between the five partner countries:
 - How do these differences play out?

- What are the consequences of these differences?
- How could they, in your opinion, be overcome?

NATIONAL LEVEL DYNAMICS

- Are there different implementation challenges in the different countries?
 - What are the main implementation challenges?
- Are there conflicts between state institutions and traditional rule or local communities that impacts on the success of conservation?
- Is it more difficult to enforce TFCA rules on lands with certain type of ownership arrangements?
- Do you believe that the TFCA increases the conservation capacities of the involved countries? Why?
- Consider hypothetically that the rangers of one involved country are less committed on approaching poachers. Do you think such behavior make rangers from other involved countries to also less committed? Or do they learn in fact to commit and approach poachers themselves? Can you give any examples? Does behavior travel from countries with more committed rangers to countries with less committed staff or, vice versa, does behavior from countries with less committed people travel to states with committed staff?
- Does the success of the TFCA depend heavily on the national bureaucratic capacities? Is there variation across the involved countries? Do you have examples?

LOCAL LEVEL COOPERATION

- Do you perceive that the local communities appreciate the TFCA?
 - Does the level of “support” vary across the involved countries?
 - Does it vary within the TFCA and its various types of protection schemes?
 - If so, can you explain why this varies?
- Do you perceive that local communities trust TFCA officials?
 - More so than national institutions?
- Are locals involved in deciding the rules in the TCFA?
- Are locals involved in making sure that people follow the rules?
- Is this more common in some areas of the TFCA?
- What are the benefits and potential problems with involving locals in enforcement to a larger extent?
- If locals are involved in enforcing rules, do you think that these locals will be hard on poachers or will they let people poach freely?
- Are locals themselves willing to comply with rules and regulations?
 - Do they trust the rangers? Do they trust that the rangers implement and enforce policies impartially?
- What, in your opinion, are the most effective means to ensure the compliance of / support from local communities?
- How can the legitimacy of the TFCA be enhanced even further?

- The master integrated development plan describes that human-wildlife conflict is believed to be widespread:
 - How does this play out?
 - What are the consequences?
 - And what is done to reduce these kinds of conflict?

ENFORCEMENT STRATEGIES AND CAPACITIES

- How many rangers are working in the TFCA?
- What mandate do rangers have?
- Are they employed by the TFCA or by their respective national ministries/governments?
 - Do they receive common training? If so, what type of education (i.e. policing, conservation ecology training etc.).
 - Do the rangers cross borders and cooperate between the countries?
 - What equipment do they have at their disposal?
 - What mandate do they have? Do they make arrests?
 - What happens if poaching is encountered? What are the sanctions? Can you describe such a typical procedure?
 - Can a national legal system convict perpetrators from other countries?
 - Are there types of poaching of “minor scale” that is not punished by rangers?
 - Tell us about the “joint poaching strategy plan” and the existence of a “wildlife crime prevention unit”: Are they being implemented? In all countries?
- Is it difficult to recruit rangers?
- What type of motives do you think attracts rangers to such positions?
- How would you describe the security situation facing the rangers?
- What is being done to ensure and enhance the commitment and loyalty of the rangers to the TFCA:s conservation objectives?

COMPLIANCE AND BIODIVERSITY OUTCOMES

- How would you, yourself, define “effectiveness” of a TFCA? How would you define “success”?
- How does KAZA monitor and evaluate the effectiveness of the TFCA?
 - Do the KAZA staff survey the animals? Other biodiversity outcomes? Conservation targets?
- What, in your perception, are the most effective means to foster compliance with rules and regulations?
- The master integrated development plan identifies poaching as a common problem:
 - How common do you perceive it to be?
 - What type of poaching is most frequent?
 - Who is the typical perpetrator?
 - Is it more frequent in certain areas of the park?
 - How do the poachers go about?

- Have there, in your opinion, been any changes in levels of poaching during recent years?
- Do you have a record of poaching events? Number of arrests and convictions?
- How would you define the causes/drivers behind this problem? Who are the actors involved? Who benefits?
- What is currently being done to combat poaching?
- What would, ideally, be done to combat poaching?
- Given the current challenge of poaching, what is the way ahead:
 - Is it increasing tough sanctions? Would higher penalties make a difference?
 - Is it to design other, more “soft” policies?
 - Is it even making poaching completely legal?

CONCLUDING REFLECTIONS

- How would you define the main challenges facing the TFCA?
 - How are these challenges being addressed? What would the solution to the identified problems look like?
 - Are there reforms that have worked? Can you give examples?
 - Were some reforms less successful? Can you give examples?
 - Why did the reforms not work?

Do you see problem as one of resources (lack of rangers) or one of people’s attitudes to others’ behavior?

Overview respondents from interviews

Interview 1	31-01-2017 Botswana
Interview 2	31-01-2017 Botswana
Interview 3	01-02-2017 Botswana
Interview 4	01-02-2017 Botswana
Interview 5	01-02-2017 Botswana
Interview 6	01-02-2017 Botswana
Interview 7	01-02-2017 Botswana
Interview 8	02-02-2017 Zimbabwe
Interview 9	02-02-2017 Zimbabwe
Interview 10	02-02-2017 Zimbabwe
Interview 11	04-02-2017 Zambia
Interview 12	04-02-2017 Zimbabwe
Interview 13	04-02-2017 Zimbabwe
Interview 14	04-02-2017 Zimbabwe
Interview 15	05-02-2017 Zimbabwe