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Governance of protected areas in Africa: a global review

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UNEP-WCMC

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Table of Contents

1. Executive Summary

This study provides an overview of the different protected area (PA) governance types that currently exist across Africa, as well as their contribution to preserve biodiversity, and the social, ecological and political contexts within which they are likely to operate.

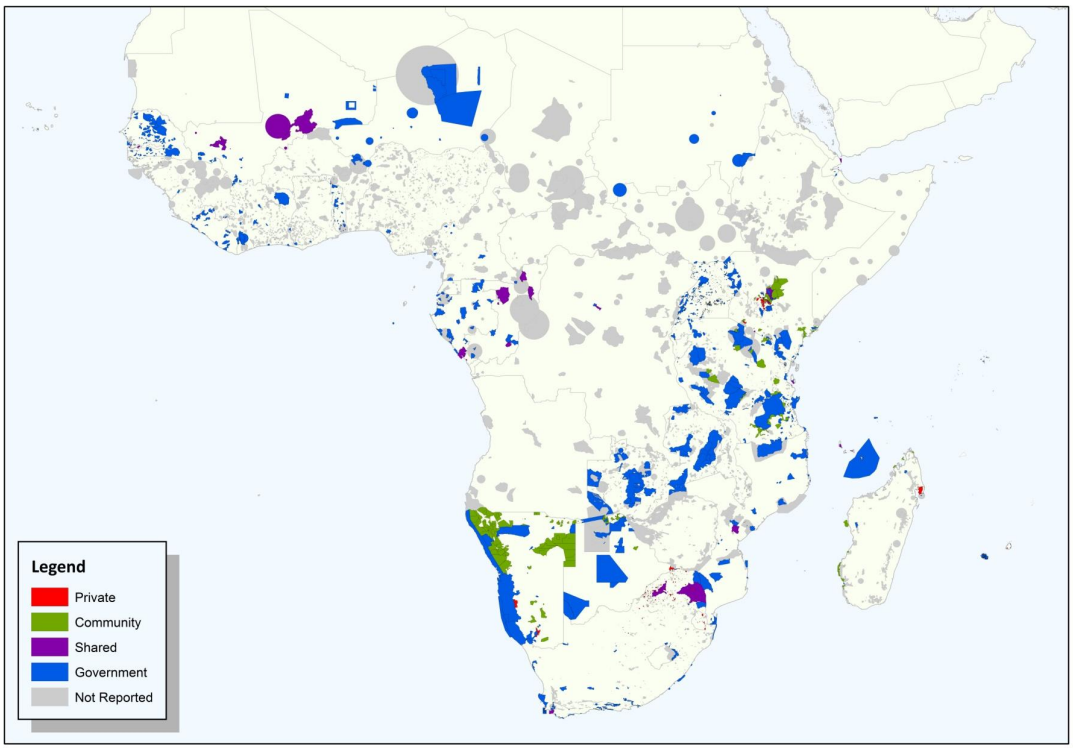
Spatial Analyses

Distribution and characteristics of different PA governance types in Africa

For the spatial analyses, we used the data available in the World Database on Protected Areas (WDPA), augmented by records from the ICCA (Indigenous and Community Conserved Areas) Registry, the Protected Area Management Effectiveness (PAME) database and additional data provided by the governments and NGOs from The Gambia and Kenya. We used the IUCN definition of a protected area to select the sites covered and we used the four PA governance type categories defined by IUCN:

- Governance by government: governance by a government body (e.g. Ministry or Park Agency) at federal, state, sub-national or municipal level
- Shared governance: governance shared between entitled governmental and non-governmental actors
- Private governance: governance by an individual, cooperative, NGO or corporate
- Community governance: governance of indigenous peoples' areas and territories and governance of community conserved areas by local communities

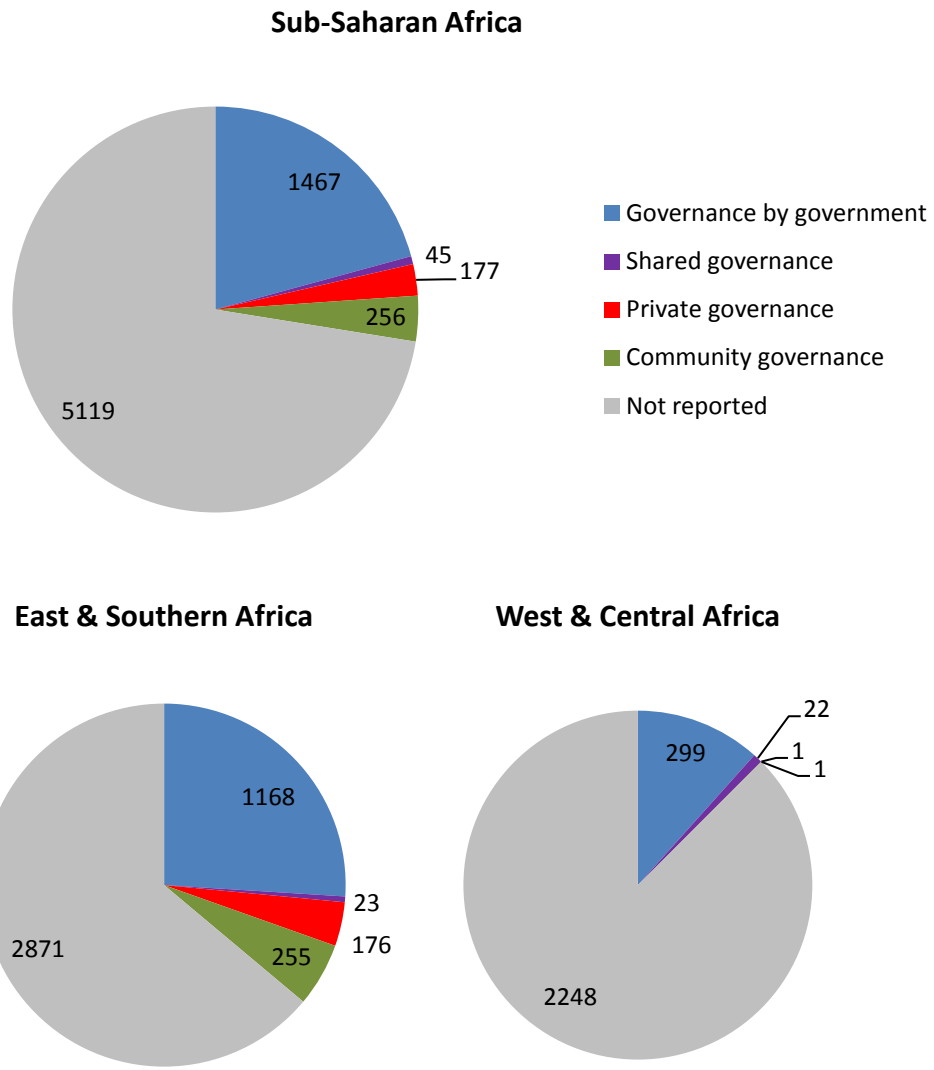
The map below shows the distribution of protected areas under different governance types in Africa, and highlights important areas of gap, with a better reporting of governance type found in East and Southern Africa than in West and Central Africa.



Protected areas in sub-Saharan Africa under different governance types.

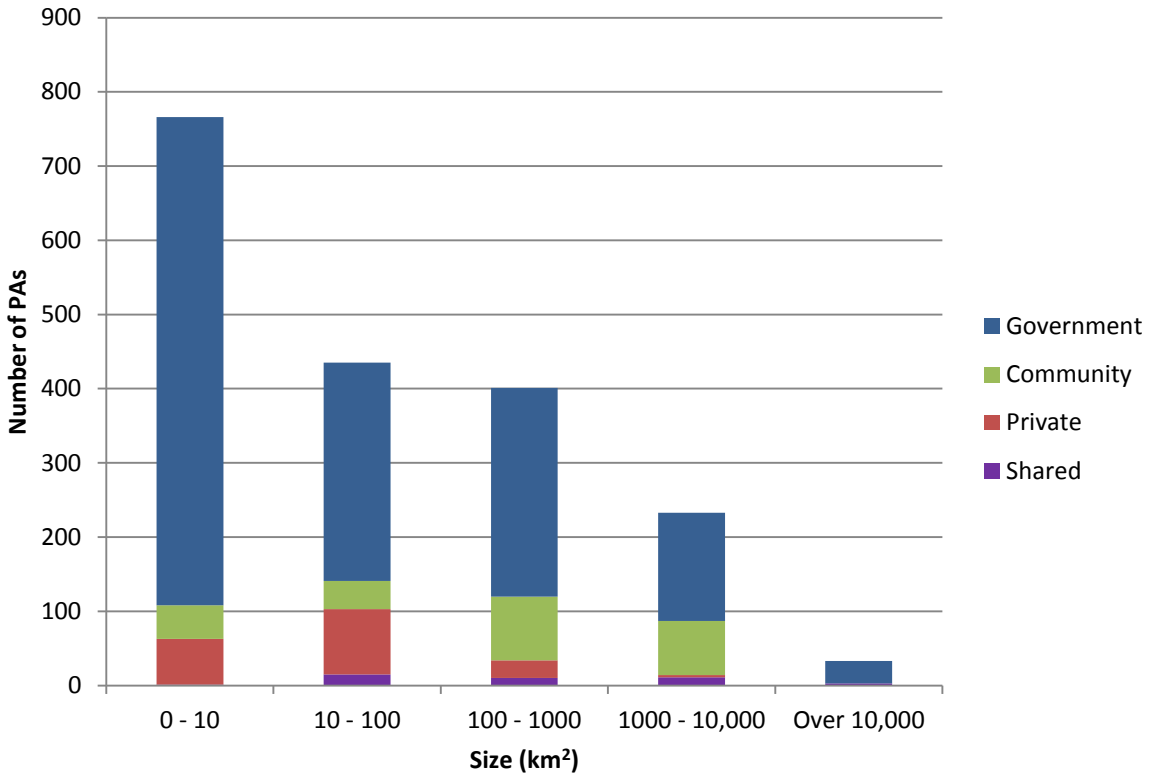
Our spatial analyses revealed that only a small percentage of protected areas have a reported governance type in sub-Saharan Africa (27.5%, 37.9% coverage), with a greater proportion reported in East and Southern Africa (36.1%, 46.7% coverage) than in West and Central Africa (12.56%, 23.1% coverage). Globally, 88% of PAs in the WDPA have an assigned governance type, covering 68% of the terrestrial surface, with over 50% under state governance (Juffe-Bignoli et al., 2014). This shows that reporting on governance in sub-Saharan Africa is much lower than the global average.

As shown in the pie charts below, of the protected areas with a reported governance type, there were also differences between these two regions. In West and central Africa, almost only state governed PAs are found, whereas in East and Southern Africa, there is a small proportion of PAs under community and private governance. These PAs are often localised in a few countries; for example, there is a relatively high proportion of community PAs in Namibia.



Percentage of protected areas under different governance types in sub-Saharan Africa and in the two Africa regions, with total numbers indicated in each category.

The most common size for protected areas in sub-Saharan Africa (for which information on governance type was available) is less than 10 km^2, with some differences between governance types: PAs under shared governance typically range between 10 and 10,000 km^2, while PAs under private governance are less than 1,000 km^2, and state PAs can be over 10,000 km^2.

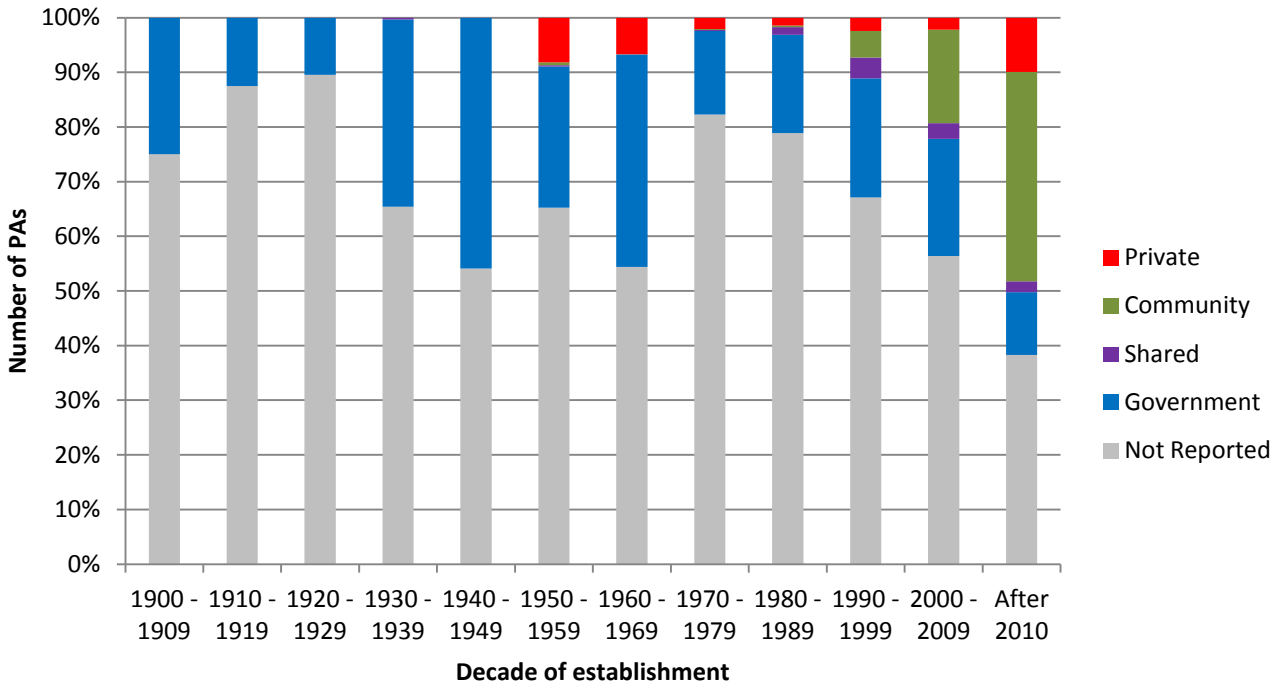


Number of protected areas in different size ranges according to governance type.

Protected areas for which spatial data was available cover 13.4% of sub-Saharan Africa's land area and 2.6% of the marine area (taking into account territorial seas and EEZ). Across all sub-Saharan Africa, state governance represents 35.6% of the total PA coverage (1,273,123 km^2), community governance 6.5% (232,277 km^2), shared governance 3.3% (117,452 km^2), and private governance 0.3% (12,757 km^2).

Regarding similarities and differences between the two regions of Africa we considered, our analyses showed that for both regions, when reported, the highest coverage (surface area) is provided by state PAs (75.8% for Southern and Eastern Africa and 83.5% for West and Central Africa), followed by shared governance (3.8% and 16.4 %, respectively). In Southern and Eastern Africa, protection is also provided by PAs under community governance (19.4%) and to a much lesser extent private PAs (1.0%), whereas these governance types are practically inexistent in West and Central Africa.

Looking at the evolution of governance types, considering the year of establishment of the PA, we found that prior to the 1950's, all protected areas were under state governance. The proportion of PAs under other governance types then gradually increased, making up almost half of protected areas gazetted after 2000. The proportion of PAs with a reported governance type has also been steadily increasing since the 1970's. However, according to Juffe-Bignoli et al. (2014), information on the governance type of PAs not under government management is still often unreported.

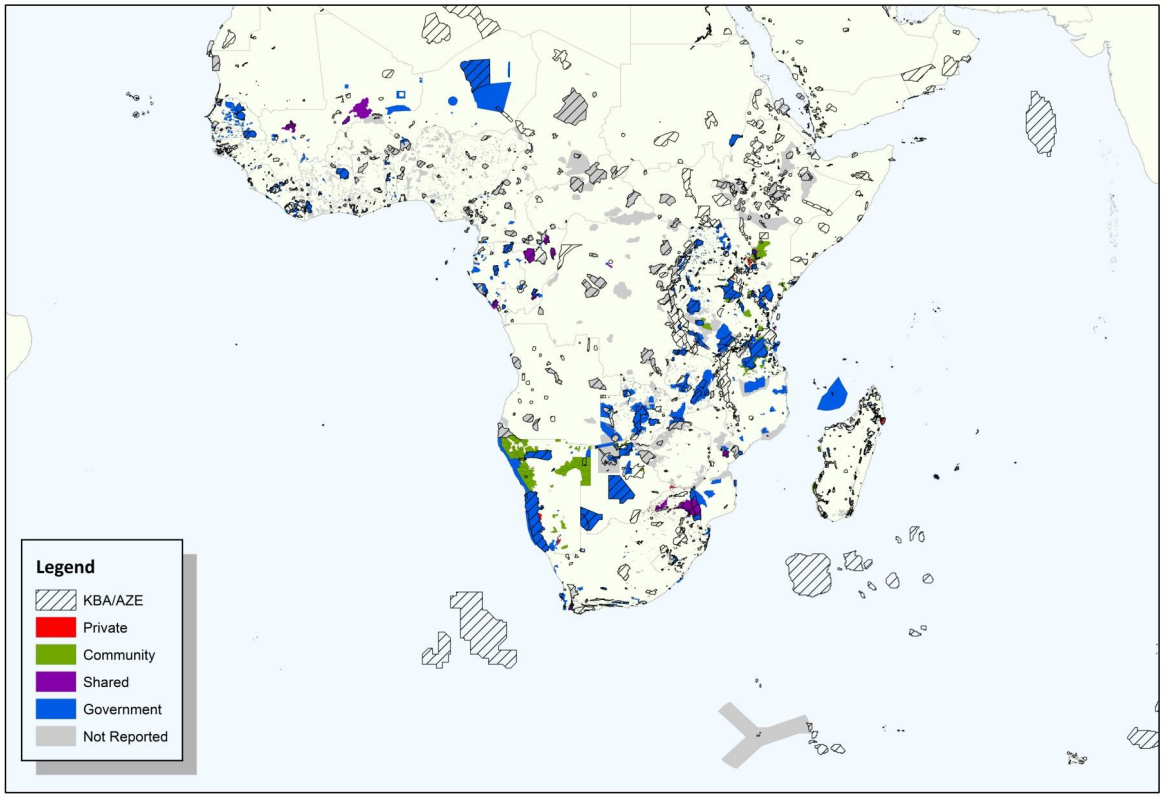


Proportion of the number of PAs established for each governance type per decade.

Our study also showed that, when the governance type was reported, PAs under the same governance type had the tendency to cluster together. This, however, could be due to the fact that certain types of PAs appear to be localised in specific countries, such as for example community governed PAs in Namibia.

<u>Contribution of PAs under different governance types Key Biodiversity Areas</u>

We found that 69% of the Key Biodiversity Areas in sub-Saharan Africa are at least partially included in a protected area, and 30% of this protection is provided by state PAs, while this governance type constitutes only 21% of the PAs found in the region. In terms of coverage, 66% of these KBAs are found in PAs with a non reported governance type, followed by 45% in state PAs. However, this could be partially due to the methodology used for the definition of KBAs in Africa, where PAs were often chosen as representatives of regions of homogenous biodiversity (Neil Burgess, pers. comm.).



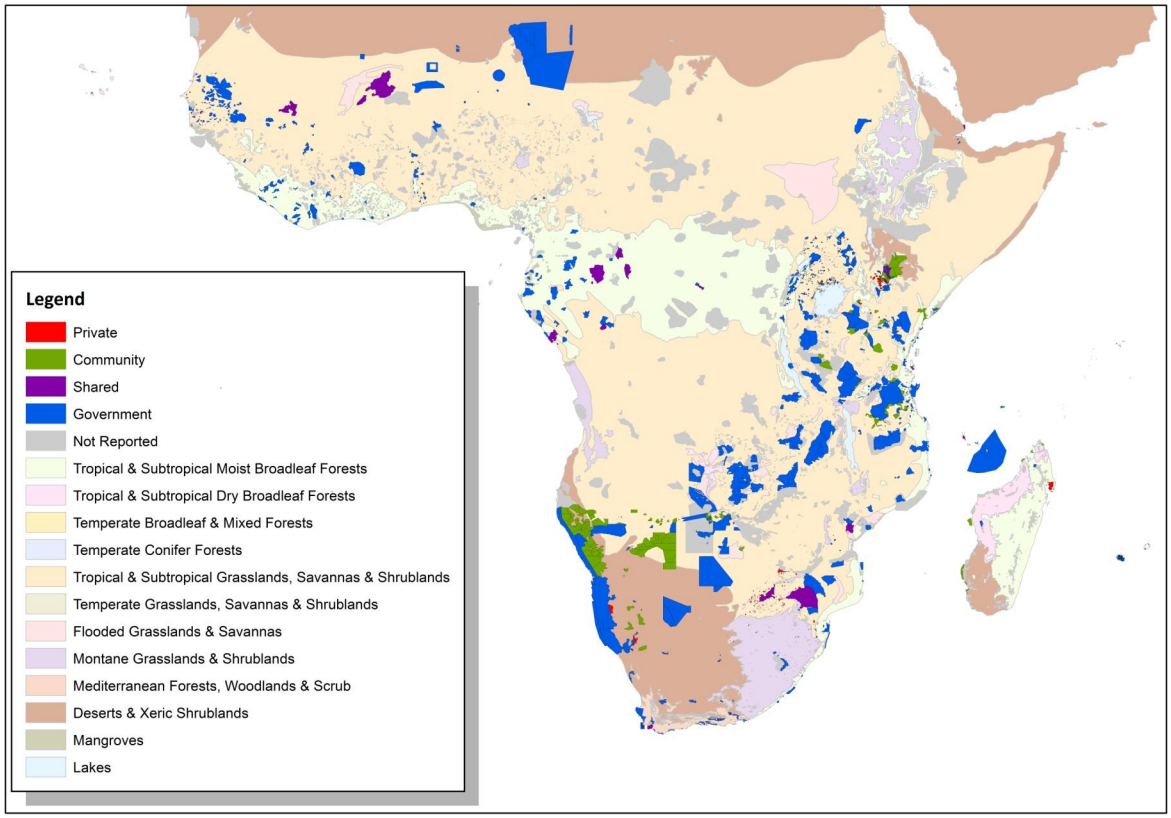
Protected areas under different governance types and their overlaps with AZEs and KBAs.

We next looked at the average number of mammal, bird, and amphibian species, as well as the numbers that are threatened, that could be found in each PA using the recorded species ranges in the IUCN Red List of Threatened species. Based on the available data, our analyses suggested that PAs under state governance might protect significantly more species compared to PAs under other governance regimes, but this could possibly be due to the generally larger size of state PAs compared to PAs under other governance types. Our results also seem to indicate that PAs under community governance might protect significantly more threatened mammal, bird and amphibian species compared to PAs under other governance types. However, it should be stressed again that these results are indicative, as they are based on data of a limited number of taxa where globally comprehensive assessments are available. The results may also be affected by limitations associated with species ranges (including commission and omissions errors) and by the fact that a large number of PAs have a non reported governance type, and should therefore be interpreted with caution.

Finally, we attempted to identify additional spatial (and non spatial) datasets which could shed some light on the contextual elements that might influence the establishment or maintenance of certain governance types.

Regarding the biogeographical region in which PAs under various governance types are found, our results suggested that, compared with the overall proportion of PAs found in sub-Saharan Africa, there seemed to be some over- and under-representations of specific governance types in the different biomes. However, these results could be an artefact caused by the different proportions of PAs with an unreported governance type across biomes. These preliminary results should therefore

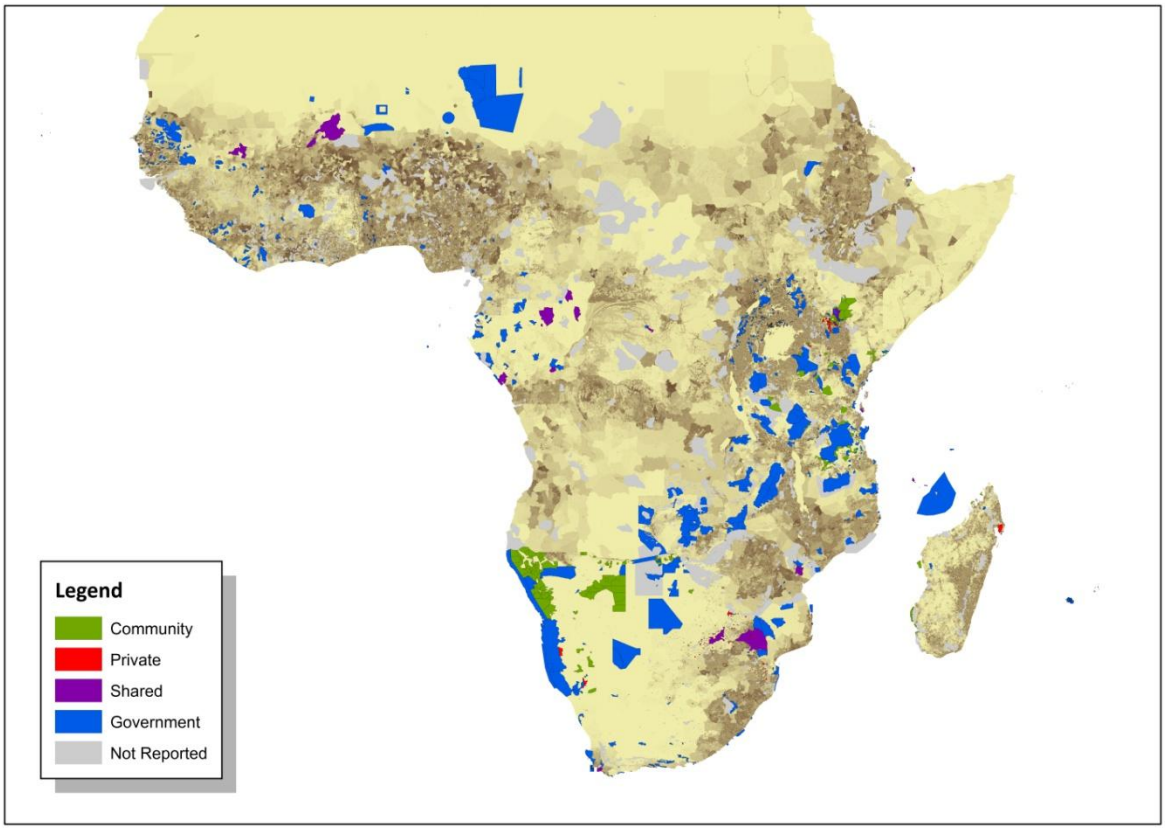
be further investigated if and when more complete and accurate data on governance types becomes available. Interpretation of these results should also consider the relative precision of protected area boundaries compared with biome boundaries.



Protected areas under different governance types and biomes.

Socio-economical and political context

Our analysis of the links between human population density (AfriPop dataset) and PA governance types revealed that, for the PAs that were large enough to be included in the analysis, PAs under state governance had a significantly higher population density than PAs under different governance types. However, pairwise comparisons revealed that the difference was mostly due to the large difference in population density between state PAs and PAs with a non-reported governance type. These results will therefore need to be confirmed based on more accurate information on governance types.



Population density and protected areas under different governance types

Finally, we investigated the possible correlation between PA governance types and the socio-economic and political contexts by looking at the Gross Domestic Product (GDP) and Index of African Governance per country, but no significant correlation was found with the proportion of the non state governed PAs. However, these analyses also required the exclusion of the smallest PAs; given that PAs under community and private governance tend to be smaller, they are more likely to have been excluded than PAs under state governance (or unreported). The literature review, presented below, further investigates the socio-economical and political contexts influencing the governance type of protected areas.

Literature review

The objectives of the literature review were to provide an overview of different types of governance found across sub-Saharan Africa, to describe each governance type in the African context, identifying factors that have influenced their emergence, to discuss strengths and weaknesses of each governance type, and finally to shed light upon elements that may have an impact on governance quality.

State governance

Governance of PAs by the state is the most common model throughout sub-Saharan Africa. The prevalence of state-governed PAs originates from Africa's colonial past as the first African PAs were created starting in the mid-1920s and 1930s when the power to govern these was firmly vested in

the state. This marked the beginning of an era of nature conservation dominated by principles of strict separation of humans and nature, which excluded people from PAs and limited or forbid their rights for consumptive use (Adams and Hulme, 2001a). When African countries started gaining their independence from the 1950s onwards, this top-down form of PA governance was inherited, which often meant that states further centralized control, including power over natural resources and land tenure rights, therefore contributing to the continued existence, expansion and creation of PAs that are under state governance (Büscher and Dietz, 2005; Roe et al., 2009; Ribot, 2002). Despite international movements towards participatory resource management beginning in the 1980s, African states often retain the highest level of authority and hold greatest decision-making powers. Central governments often retain rights over the most lucrative resources, be it land or wildlife, in order to control the main channels of revenue generation. Many African states therefore often maintain ultimate control of PA governance through shortfalls in decentralization policies and rights to natural resources, even when responsibilities and decision-making powers are meant to be shared or fully devolved to communities or other stakeholders (Murphree, 2009; Nelson and Agrawal, 2008; Ribot, 2002).

Strengths. PAs governed exclusively by the state certainly play a crucial role in the conservation of biodiversity as they are the most common form of PAs, covering vast areas of ecological importance, which have the ability to safeguard greater numbers of species and maintain intact habitats as well as ecosystem services (Ladle et al., 2011). Without these PAs, significantly less area would be designated to biodiversity conservation. Furthermore, having a higher level of authority and access to law enforcement through the government, PAs governed by the state can also have the power to act legally against encroachment into PAs (Pfeifer et al., 2012).

Weaknesses. Strict, top-down, exclusive state governance of PAs can have many negative impacts on local populations, including cases of eviction, restriction of access to forest products, land and employment (Brockington and Igoe, 2006; Cernea and Schmidt-Soltau, 2006). Where disempowered communities remain within or around the PA, and when forest laws are weakly enforced, compliance with restrictions on resource use is less likely (Ongugo, 2002). Therefore, these conventional, top-down PA practices can backfire on conservation efforts through retaliatory actions by disempowered communities, conflicts with PA managers, and the inability to use the knowledge and practices of local people, all of which negatively affects the effectiveness of the PA (Kothari, 2008; Rosendo et al., 2011).

Private governance

In sub-Saharan Africa, privately protected areas (PPAs) most often take the form of private game ranches, private nature reserves and private conservancies, and neighboring landowners can pool natural and financial resources for the purpose of conserving and sustainably utilizing wildlife. A key contextual element creating conditions favorable to the development of PPAs therefore includes the existence of natural features and landscapes favorable to developing markets for wildlife, such as is the case in many parts of Eastern and Southern Africa (Jones et al., 2005). The growing popularity of wildlife-based markets and wildlife-based land use as well as the existence of legislation and policies enabling private entities to benefit from wildlife are critical drivers of the creation of PPAs (Suzuki, 2001). Furthermore, land tenure regimes and legislation favorable to private ownership are key (Kreuter et al., 2010; Jones et al., 2005). Personal conservation objectives of landowners as well as

innovative government policies promoting conservation through different forms of private protection have also influenced the establishment of PPAs (Von Hase et al., 2010).

Strengths. A key strength of privately governed PAs that has been identified in the literature is their protection of biodiversity by, for example, safeguarding habitat types and threatened species not covered by PAs under other forms of governance (Gallo et al., 2009). Furthermore, PPAs have been shown to be particularly effective in capturing the economic value of biodiversity, thereby making conservation a financially competitive land use (Sims-Castley et al., 2005). Due to their inclusive nature, PPAs can also provide many social benefits, which have become apparent in the form of jobs, contributions to schools and other social welfare activities, as well as in the form of assistance to communities in managing their own conservation areas (Jones et al., 2005).

Weaknesses. The potential impermanence of PPAs both in terms of biodiversity protection and management is a noticeable weakness of this governance type, being privately owned, land can be sold and management can change hands (Langholz and Krug, 2004). As PPAs are often incentivized by ecotourism or game hunting, private owners may also artificially alter species compositions and too intensely manage wildlife to make their PPAs more attractive. The small size of PPAs can also be disadvantageous to protecting larger species (Cousins et al., 2008). Furthermore, while tourism in PPAs can generate important revenues, relying on ecotourism and external markets for game can be risky as the industry is vulnerable to fluctuations of external factors, such as terrorism, political unrest, or natural disasters (Langholz and Krug, 2004). There is also a risk of elite or foreign capture of PPAs and their accountability and transparency may not always be apparent (Borrini-Feyerabend et al., 2013).

Community governance

The multiplication of the various forms of community governance of natural resources across sub-Saharan Africa began in the 1980s and 1990s, driven by the international push for participatory natural resource management. The international conservation community was increasingly coming to understand that, when fully empowered, local communities can become reliable stewards of the environment while improving their livelihoods and delivering sustainable conservation (Matose and Watts, 2010; Murphree, 2009; Treue et al., 2014). As truly effective community governance can only occur when communities possess sufficient power to make decisions and to develop rules for natural resources, the existence of effective decentralization policies, laws and regulations pertaining to natural resource governance and land tenure are key to communities being able to manage their own resources (Murphree, 2009; Nelson and Agrawal, 2008; Ribot, 2002). The overall political disposition and levels of democratic governance of a country that allow for devolution of power and benefit-sharing are thus also crucial in allowing for community governed PAs to be created. Many African states have been reluctant to devolve the level of authority necessary for effective community governance and so community governed PAs often face serious constraints and may not qualify as true community governance in many cases.

Strengths. Where conditions have made it possible for PAs governed by communities to become established successfully, sustainable protection of biodiversity is possible. Community PAs can cover large areas of land inhabited by threatened species, and community laws have been successful at regulating sustainable levels of wildlife off-take (Arntzen et al., 2003; Nelson and Gami, 2003).

Furthermore, the social inclusion and empowerment of local communities under this governance type has many development benefits such as creating employment, improving access to water, schools, lighting and health care (Sheppard et al., 2010). PAs under community governance are also said to allow for biodiversity conservation to take place at a relatively low cost and with little unnecessary bureaucracy (Kothari, 2006).

Weaknesses. Communities can suffer from internal inequities and social injustices, in particular when the most powerful community members make decisions regarding resources. Elite capture of power is a common problem and can lead to the richest and most powerful members capturing a disproportionate amount of benefits, thus hindering the success of community-based initiatives. Community-governed PAs can also suffer from inter- and intra-community clashes and difficulties over management approaches as well as from conflicts between customary and statutory institutions where traditional authorities are being undermined. Previously sustainable levels of resource use may be causing over-exploitation, as natural resources may no longer be as abundant due to activities such as hunting.

Shared governance

When PAs are under shared governance, institutional mechanisms or processes are in place either formally or informally that outline how authority and responsibilities are to be shared among several stakeholders, such as governments, NGOs and communities. It is very likely that the actual number of shared governance situations is higher than the number officially reported as many other governance types probably do not exist in the purest form according to their strict definition and could therefore, in reality, be classified as shared governance. Effective shared governance situations can only be created where meaningful sharing of power is possible in order for multiple actors to have meaningful participation (Borrini-Feyerabend et al., 2013; Arts, 2003). Whether or not powers are shared in order to build fruitful collaborations can certainly be influenced by the central government's political willingness to do so, as well as the wider political situation of a country (Metcalfe, 2003). Furthermore, as with the other governance types, the paradigm shift in environmental governance and multiplication of actors has contributed to the multiplication of this form of governance. Additionally, democratic decentralization of natural resources and supportive land tenure policies are also crucial for power and responsibilities to be shared amongst multiple stakeholders.

Strengths. PAs under shared governance, in particular transboundary PAs, can be of particular importance to the conservation of biodiversity as they can cover and protect large areas of continuous habitat, even across borders (Plumptre et al., 2007; Gardner et al., 2007). Furthermore, these PAs can allow for more equitable management and benefit-sharing due to more inclusive multi-stakeholder governance. Such PAs can provide means of increasing economic opportunities, decreasing cultural isolation, as well as fostering cooperation in a bilateral and regional framework. By combining skills and resources of multiple stakeholders, PAs under shared governance also have the potential to maximize impacts in promoting sustainable land use, biodiversity conservation and alleviating poverty in rural areas (Munthali, 2007).

Weaknesses. While involving many stakeholders can have multiple benefits, partnerships in co-management arrangements can also be problematic as the nature of power sharing can make less

powerful partners, such as indigenous people, disadvantaged (Nadasdy, 2003). Under such arrangements, there is also a risk of power being hijacked by just one stakeholder, such as the state. Furthermore, as many parties are involved in this governance type, clashes between stakeholders can occur more easily. While there are numerous benefits of shared governance, transboundary PAs in particular, may not always be appropriate in every situation as landscapes, social relations and governance strategies of already existing PAs may be too different to integrate and could therefore decrease the effectiveness of current conservation initiatives (Petursson et al.,2003).

Synthesis and conclusion

Our study provides an overview of the different PA governance types that exist in sub-Saharan Africa. It highlights a number of factors that can influence the type of protected area governance put in place, and the strengths and weaknesses of each governance type.

Based on the findings of the literature review and the results of the spatial analyses, we summarized the factors and contextual elements that we identified as being more likely to influence the establishment (or maintenance, in the case of state PAs) of a certain type of PA governance in the table below.

Study	Factors / Contextual elements	State	Private	Community	Shared
Literature review	Colonial history and post-colonial formation of states	✓✓✓	✓	✓	✓
	Shift in international paradigm of environmental governance		✓✓	✓✓✓	✓✓
	Emergence of new actors in environmental conservation		✓✓	✓✓	✓✓
	Political will, levels of democratic principles and sharing of power		✓✓	✓✓	✓✓✓
	Decentralization policies		✓	✓✓✓	✓✓
	Land tenure rights		✓✓✓	✓✓✓	✓
	Wildlife based markets		✓✓✓	✓✓	✓
Spatial analyses	Large geographic area	✓✓✓		✓✓	✓✓
	Old establishment date	✓✓✓			
	Number of mammal, bird and amphibian species	✓✓✓	✓	✓	✓
	Threatened mammals, birds and amphibians	✓	✓	✓✓✓[TBC]	✓
	Biome (coverage): Flooded grasslands and savannas; Mediterranean forests, woodlands and scrub; Deserts and Xeric Shrublands	✓✓✓[TBC]	✓✓	✓✓	✓✓
	High human population density	✓✓✓[TBC]	✓	✓	✓
	Gross Domestic Product (GDP)	✓	✓	✓	✓
	Index of African Governance	✓	✓	✓	✓

[TBC]: The results indicated with TBC (To Be Confirmed) are only preliminary and would need to be verified with more complete data on PA governance types.

The literature review showed that the colonial history of African states initially lead to the creation of state PAs, while a shift in paradigm of environmental governance and the appearance of new environmental actors led more recently to the establishment of PAs under other governance types. Political will, the level of democracy and power sharing also facilitate the creation of PAs under non state governance, notably shared governance. Decentralization policies tend to favor the emergence of community PAs, but also shared PAs, and to a lesser extent private PAs. Finally, having clearly defined land tenure rights and wildlife based markets would allow the creation of more PAs under private or community governance.

Our spatial analyses highlighted some interesting correlations between governance types and a number of ecological, social, and political factors. Notably, state PAs tend to be larger in size than PAs under other governance types, which have usually been established more recently than state PAs. We also found a tendency for state PAs to host more species of mammal, birds and amphibians, and for community PAs to host more threatened species of the same taxa, however, these preliminary results are only based on the available data and would need to be confirmed with better data on governance types. Our analyses of PA governance per biome suggested some possible differences in governance types between biomes, but these could again be largely due to the different proportions of unreported governance type. Our analyses also showed that PAs under state governance were more often found in areas of high human population density, but no correlation was found between the governance type and GDP or Index of African Governance. Importantly, these analyses also highlighted the need for a concerted effort to improve reporting on PA governance.

2. Map and analyses

This section provides a spatial overview of the different governance types found in sub-Saharan Africa. Spatial analyses were also used to investigate the contribution of different governance types to preserve biodiversity in Africa (e.g. overlaps with KBAs, AZEs, and species extinction risks). These analyses are based on existing data in the WDPA, and when available, other protected area datasets and information provided by key protected area stakeholders.

We used the IUCN definition of a protected area: '*a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values'* [1], and the IUCN governance categories, which are divided into four broad types:

A. Governance by government: governance by a government body (e.g. Ministry or Park Agency) at federal, state, sub-national or municipal level; we also refer to it as state governance in the report;
B. Shared governance: governance shared between entitled governmental and non-governmental actors;
C. Private governance: governance by an individual, cooperative, NGO or corporate; and
D. Governance by indigenous and local communities: governance of indigenous peoples' areas and territories and governance of community conserved areas by local communities; this is referred to as community governance in the report.

The data were extracted from the World Database on Protected Areas (WDPA), which includes 7064 protected areas in sub-Saharan Africa (IUCN and UNEP-WCMC, 2014), 1945 of which have a known governance type. These include 872 protected areas for which only data points were available. We supplemented the WDPA data by additional data on governance type extracted from the following databases:

- Protected Area Management Effectiveness (PAME) database: 84 records;
- Indigenous and Community Conserved Areas (ICCA) registry: 4 records;
- Data from the Gambia: 7 records; and
- Data from Kenya: 27 records.

In the WDPA, the governance type field has a greater variety of categories, which were grouped as follows:

- State: Federal or national ministry or agency in charge; Government-delegated management; Sub-national government; Sub-national ministry or agency; and State
- Private: Non-profit organisations; For-profit organisations ; Individual landowners; and Private
- Community: Indigenous peoples; Local communities; and Community
- Shared: Collaborative governance; and Shared
- Not Reported

[1] Dudley, N. (Editor) (2008). *Guidelines for Applying Protected Area Management Categories.* Gland, Switzerland: IUCN. x + 86pp.

The map presented in Figure 1 shows the four different types of PA governance found in sub-Saharan Africa.

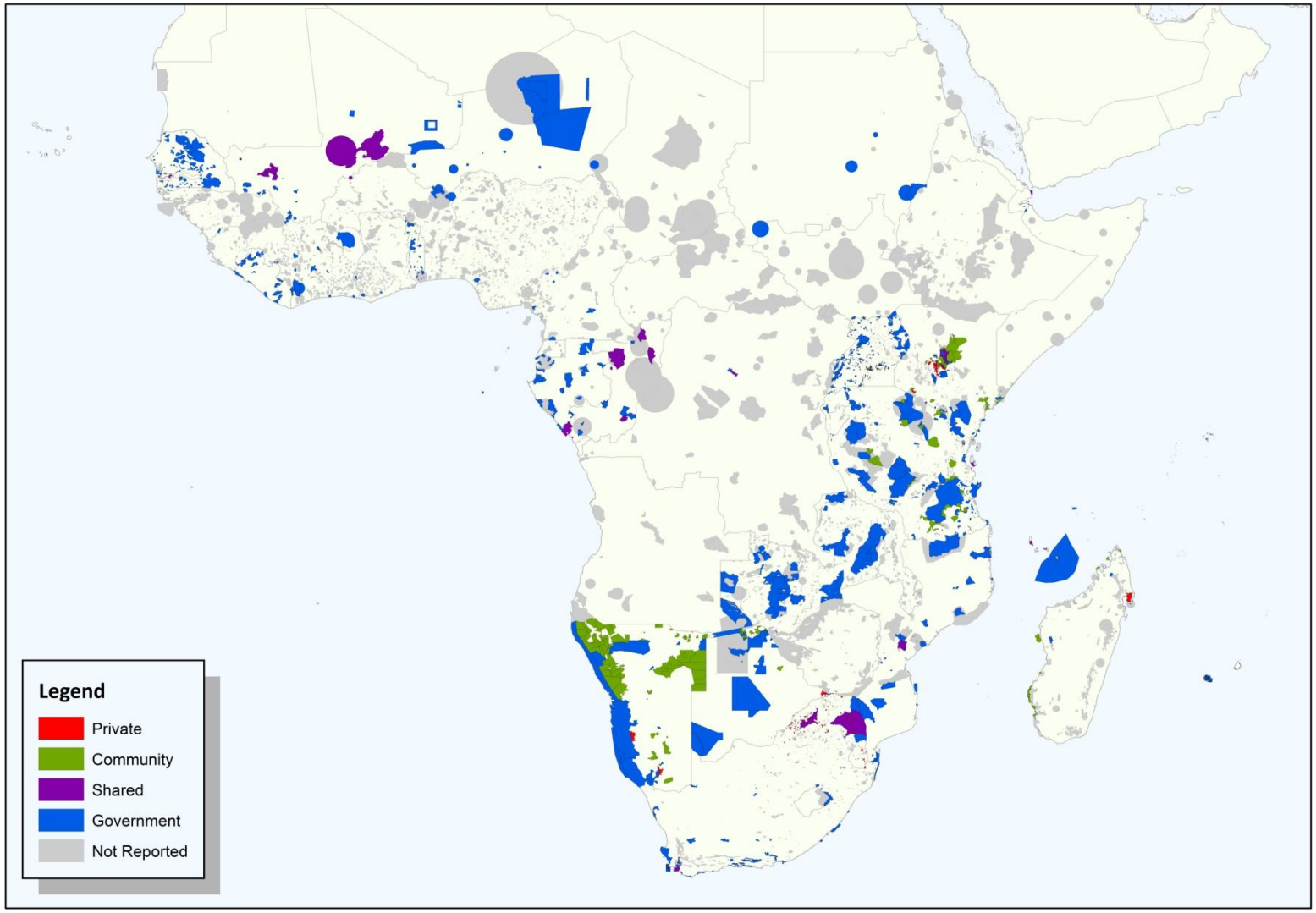


Figure 1. Map of protected areas in sub-Saharan Africa under different governance types.

Number and coverage

Based on the data we have available, in sub-Saharan Africa, protected area governance is divided as follows (including data points) (Table 1 and Figure 2): 1,467 are under state governance (20.8%), 45 under shared governance (0.6%), 177 under private governance (2.51%), 256 under community governance (3.6%), and 5119 are not reported (72.5%).

However, according to the data that is available to us, differences exist between Southern and Eastern Africa compared to West and Central Africa (as defined by IUCN): in Southern and Eastern Africa the governance type is more often reported, and there are also more protected areas under private governance (3.9%) or community governance (5.7%), governance types which are almost inexistent in West and Central Africa.

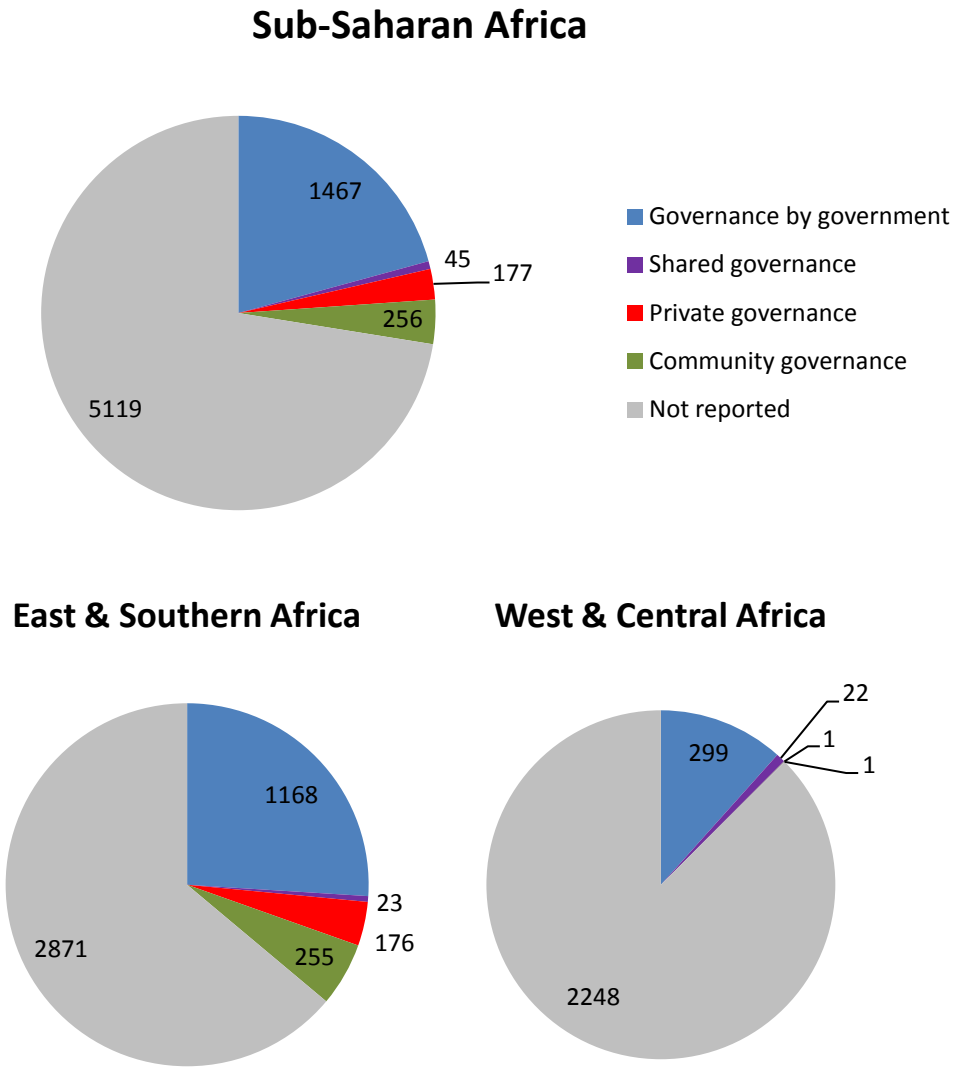


Figure 2. Percentage of protected areas under different governance types in sub-Saharan Africa and in the two Africa regions, with total numbers indicated in each category.

Looking at the coverage per protected area type (Table 1 and Figure 4), excluding protected areas for which the governance type is not reported, the highest coverage is provided by protected areas under state governance, both in Southern and Eastern, and West and Central Africa, with 40.5% and

27.4%, respectively. Including buffered points (for protected areas for which we do not have spatial boundaries) does not qualitatively change the results.

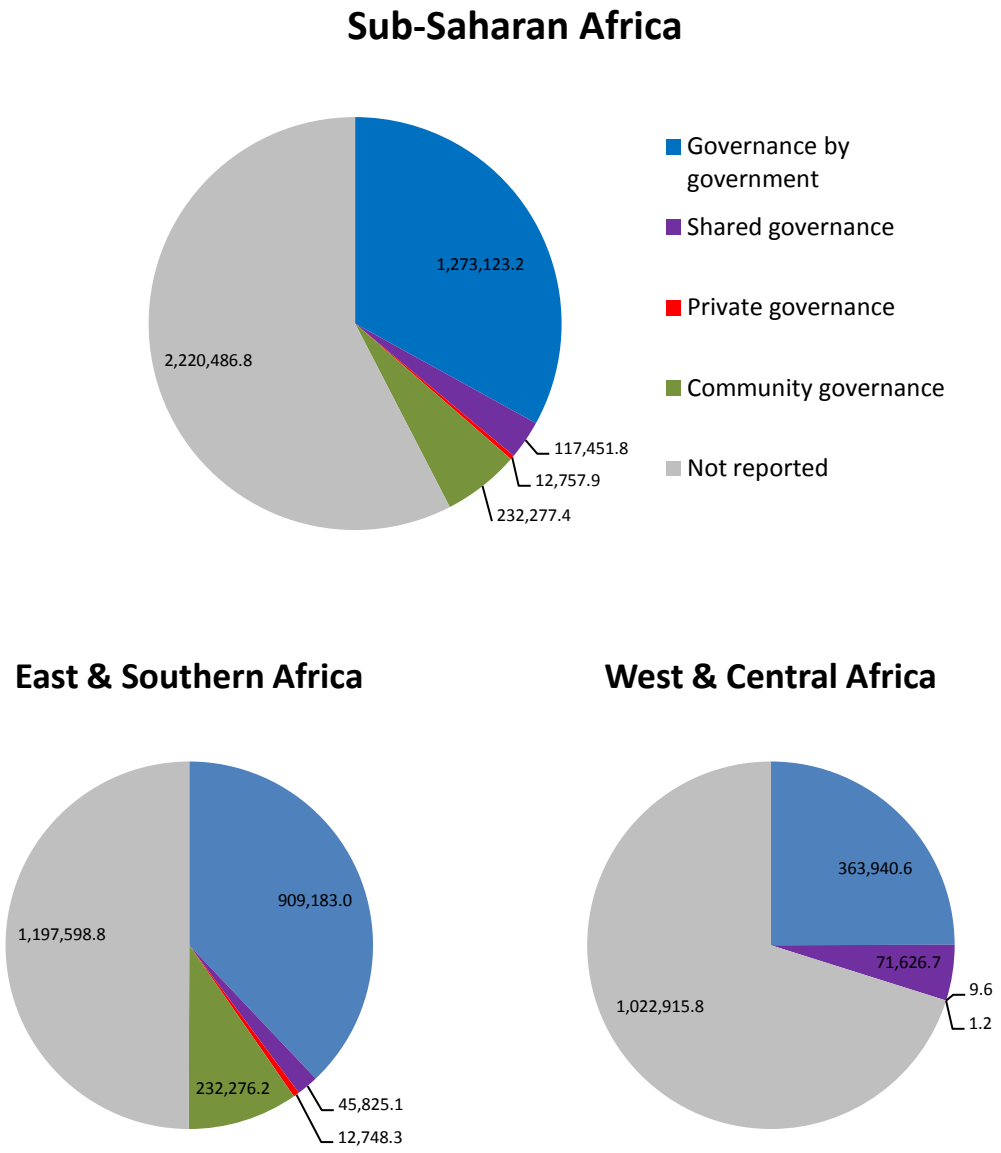


Figure 4. Percentage *coverage* of protected areas under different governance types, in sub-Saharan Africa and in the two Africa regions, with total area indicated in km^2.

It is worth noting that state managed protected areas are more likely to be included in the WDPA as they are more often reported by governments compared to protected areas under private or community governance. As also observed by Borrini-Feyerabend et al. (2013), many areas governed by communities are not yet legally recognized, meaning that the number of this governance type, but also of protected areas under private and shared governance, is likely to have been underestimated in our analyses.

Region	Governance type	State	Shared	Private	Community	Not reported	Total
Southern & Eastern Africa	Number of PAs	1168	23	176	255	2871	4493
	% number	*26.00%*	*0.51%*	*3.92%*	*5.68%*	*63.90%*	
	Coverage (km^2)	909,183.0	45,825.1	12,748.3	232,276.2	1,197,598.8	2,247,367.4
	% coverage	*40.46%*	*2.04%*	*0.57%*	*10.34%*	*53.29%*	
Western & Central Africa	Number of PAs	299	22	1	1	2248	2571
	% number	*11.63%*	*0.86%*	*0.04%*	*0.04%*	*87.44%*	
	Coverage (km^2)	363,940.6	71,626.7	9.6	1.2	1,022,915.8	1,329,496.7
	% coverage	*27.37%*	*5.39%*	*0.00%*	*0.00%*	*76.94%*	
Sub-Saharan Africa (total)	**Number of PAs**	**1467**	**45**	**177**	**256**	**5119**	**7064**
	% number	***20.77%***	***0.64%***	***2.51%***	***3.62%***	***72.47%***	
	Coverage (km^2)	**1,273,123.2**	**117,451.8**	**12,757.9**	**232,277.4**	**2,220,486.8**	**3,576,794.1**
	% coverage	***35.59%***	***3.28%***	***0.36%***	***6.49%***	***62.08%***	

Table 1. Number and percentages of protected areas under different governance types, and percentage coverage for each governance type in the two IUCN Africa regions. Numbers of PAs include data points, whereas data points are not included in the percentage coverage.

Protected area sizes

As can be seen in Figure 5, the majority of protected areas in sub-Saharan Africa (for which information on governance type was available) are smaller than 10 km^2. However, there are some distinctions between governance types: PAs under shared governance tend to be between 10 and 10,000 km^2, while PAs under private governance tend to be less than 1,000 km^2, and state PAs can be over 10,000 km^2.

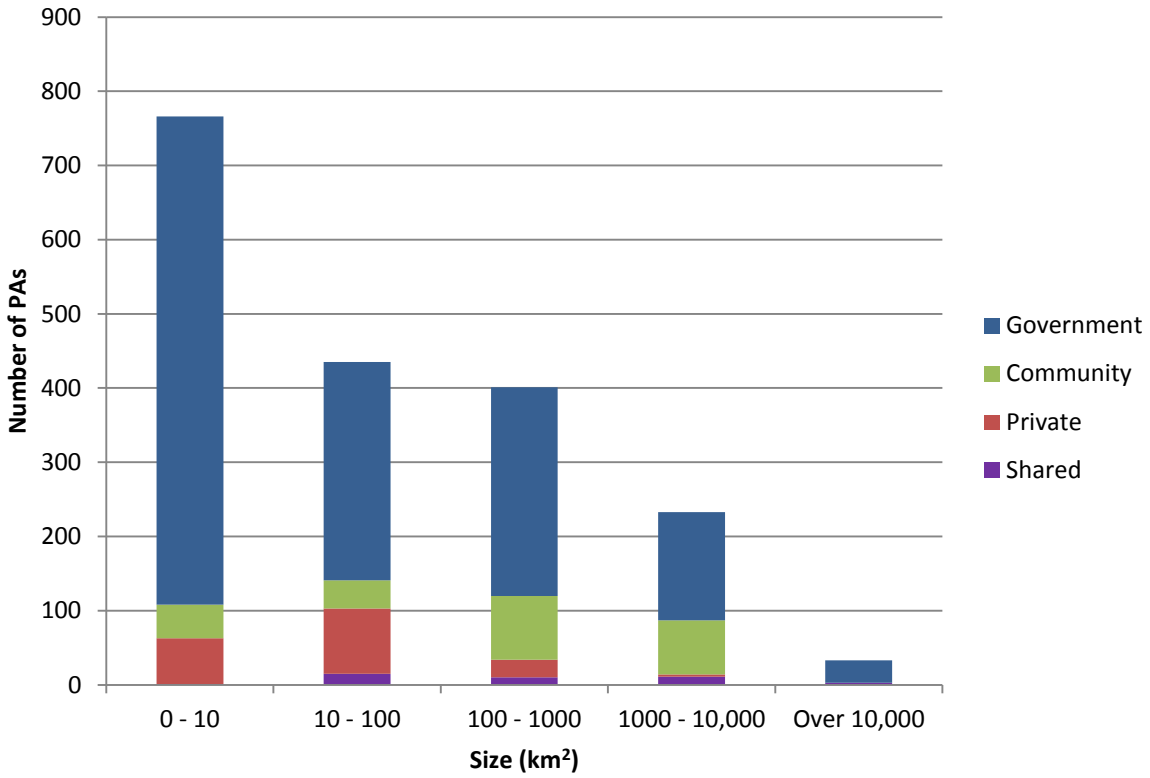


Figure 5. Number of protected areas in different size ranges according to governance type.

Terrestrial and marine coverage

The protected areas which are represented by spatial data cover 13.4% of sub-Saharan Africa's land area and 2.6% of the marine area (taking into account territorial seas and EEZ). This is close to Aichi Target 11 (which calls for protection of 17% of national terrestrial land and inland waters and 10% of marine areas) for terrestrial protection, but far from the Target with respect to marine areas.

In Sub-Saharan Africa, state governance represent 35.6% of the protected area coverage (33% terrestrial and 2.6% marine), shared governance 3.3% (3.2% terrestrial and 0.1% marine), private governance 0.3% (only terrestrial), and community governance 6.5% (6.4% terrestrial and 0.1% marine) (Table 2 and Figure 6).

The highest coverage (when reported) is provided by state PAs (75.8% for Southern and Eastern Africa and 83.5% for West and Central Africa), followed by shared governance (3.8% and 16.4 %, respectively). In Southern and Eastern Africa, a significant coverage is also provided by PAs under

community governance (19.4%) and there is also a very small coverage from private PAs (1.0%), governance types which are almost inexistent in West and Central Africa.

Given that spatial data was not available for some protected areas, these figures underestimate the actual coverage. Including buffered points (i.e. for protected areas for which we have a reported size but only a point location), the total coverage increases from 3,576,794 km^2 to 4,513,776 km^2, and the percentage coverage under state governance decreases to 29.3% while the percentage of protected areas with a non reported governance type increases to 69.0%, suggesting that the majority of protected areas with no spatial boundaries have a non reported governance type. These were not taken into account in the analyses presented here.

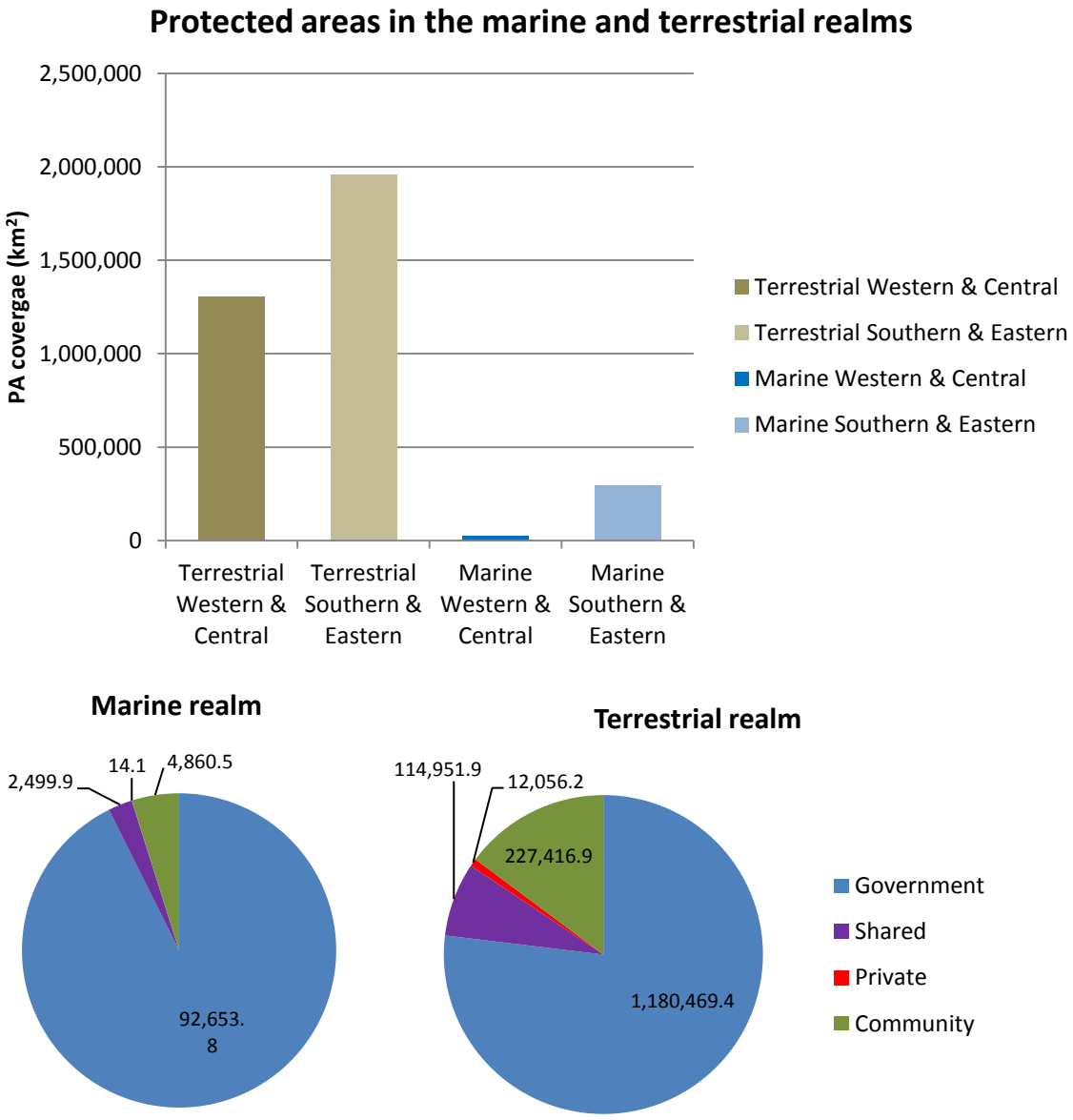


Figure 6. Coverage of the protected areas (in km^2) found in the terrestrial and marine realm in Southern & Eastern and West & Central Africa (above), and according to the four governance types (when reported) (below).

Region	Governance type	State governance	Shared governance	Private governance	Community governance	Not reported	Total
Southern & Eastern Africa	Marine coverage (km^2)	89,762.1	1,286.5	14.1	4,860.2	198,154.7	292,051.8
	Terrestrial coverage (km^2)	819,420.9	44,538.6	12,046.6	227,416.0	999,444.1	1,955,315.6
	Total coverage (km^2)	909,183.0	45,825.1	12,060.7	232,276.2	1,197,598.8	2,247,367.4
Western & Central Africa	Marine coverage (km^2)	2,891.7	1,213.4	0.0	0.0	20,834.0	24,208.5
	Terrestrial coverage (km^2)	361,049.0	70,413.3	9.6	1.2	1,002,081.9	1,305,288.2
	Total coverage (km^2)	363,940.6	71,626.7	9.6	1.2	1,022,915.8	1,329,496.7
Sub-Saharan Africa (total)	**Marine coverage (km^2)**	**92,653.8**	**2,499.9**	**14.1**	**4,860.5**	**218,989.4**	**316,261.2**
		2.59%	***0.07%***	***0.00%***	***0.14%***	***6.12%***	***8.84%***
	Terrestrial coverage (km^2)	**1,180,469.4**	**114,951.9**	**12,056.2**	**227,416.9**	**2,001,497.4**	**3,260,533.0**
		33.00%	***3.21%***	***0.34%***	***6.36%***	***55.96%***	***91.16%***
	Total coverage (km^2)	**1,273,123.2**	**117,451.8**	**12,070.3**	**232,277.4**	**2,220,486.8**	**3,576,794.1**
		35.59%	***3.28%***	***0.34%***	***6.49%***	***62.08%***	***100.00%***

Table 2. Coverage of protected areas found under different governance types in the terrestrial and marine realm, in the two IUCN Africa regions in Sub-Saharan Africa, considering only protected areas for which spatial data was available.

Governance change over time

As can be seen in Figure 7 below, and as explained in the literature review in Section 3, prior to the 1950's, all protected areas were under state governance. The proportion of protected areas under other governance regimes has since gradually increased, making up almost half of protected areas gazetted after 2000. Also, it is important to observe that the percentage of protected areas with a reported governance types has been steadily increasing since the 1970's. However, since providers of data to the WDPA may change the reported governance type over time, the existing information may not always reflect the governance type at the time the PA was created.

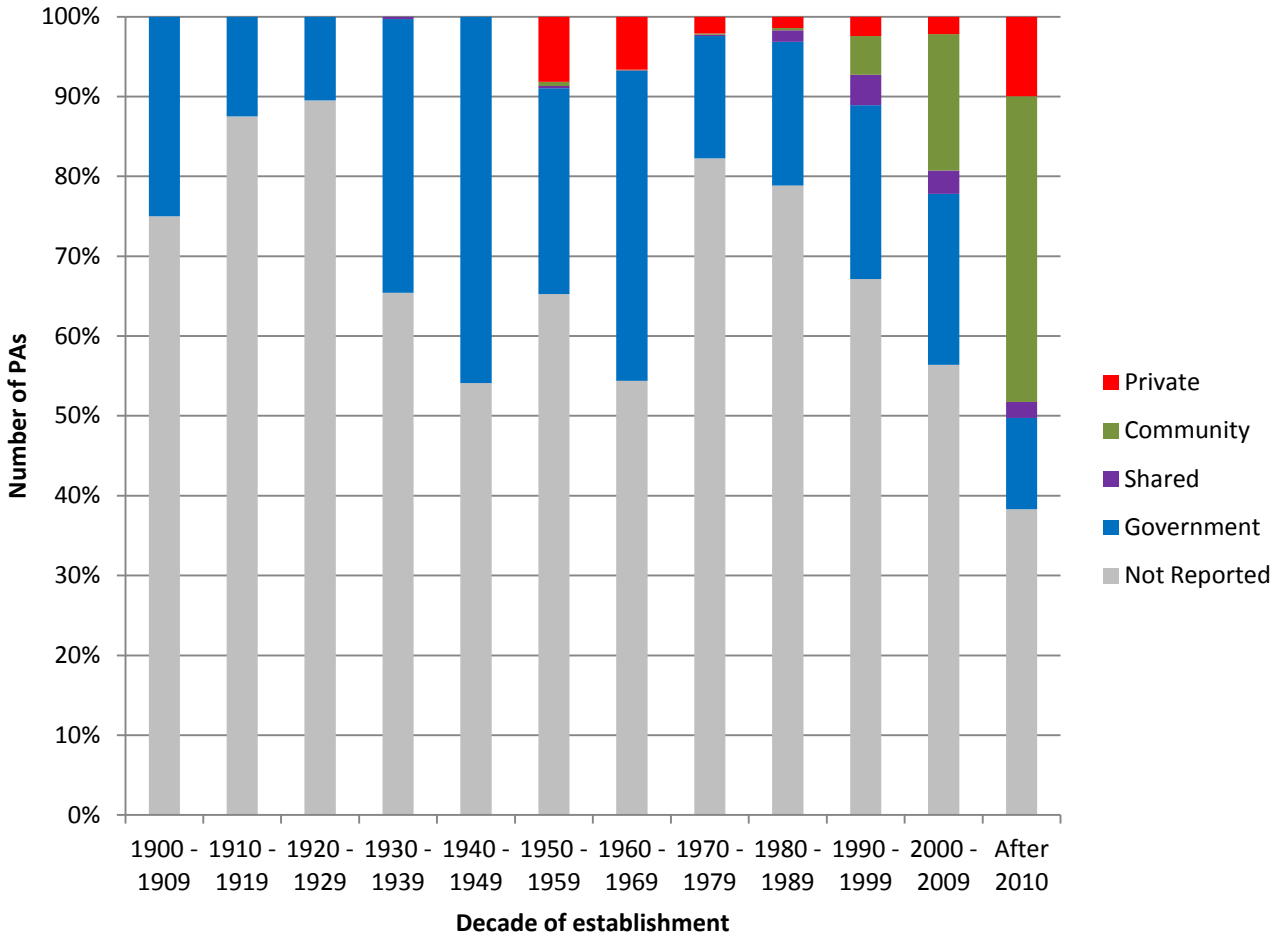


Figure 7. Proportion of the number of PAs established for each governance type per decade.

Geographic distribution

In order to better understand the geographic distribution of PAs under different governance types, we assessed whether PAs under the same governance regime tend to cluster together, or if on the contrary, certain PA governance types might provide a link between PAs under a different governance type.

To this end, we looked at the closest distance found between protected areas, which we calculated using a geodesic method that reflects the true distance over a curved surface across the African

continent. It was calculated in ArcGIS 10.2.2 using a tool called 'Near Table analysis' for protected areas for which spatial data was available (6193 unique sites). We used the following two different methods to obtain a range of possible distances:

1. We looked for the nearest polygon, including any overlapping polygons that may be under a different IUCN category, or that include or be part of another protected area. In these cases, the distance would be equal to zero. By including all zeros, this method generates seemingly the most connected result, but could be biased due to overlapping PAs. This method generates the 'most connected' result (Figure 8, upper section).
2. We identified the five closest polygons (PAs for which spatial data was available) in the vicinity of each PA in order to identify the smallest non-zero distance to avoid the bias mentioned above. If the smallest value was zero, the site was excluded, and the process repeated five times. However, this method excludes protected areas which are truly adjacent, with a distance between them equal to zero. This method generates the 'least connected' result (Figure 8, lower section).

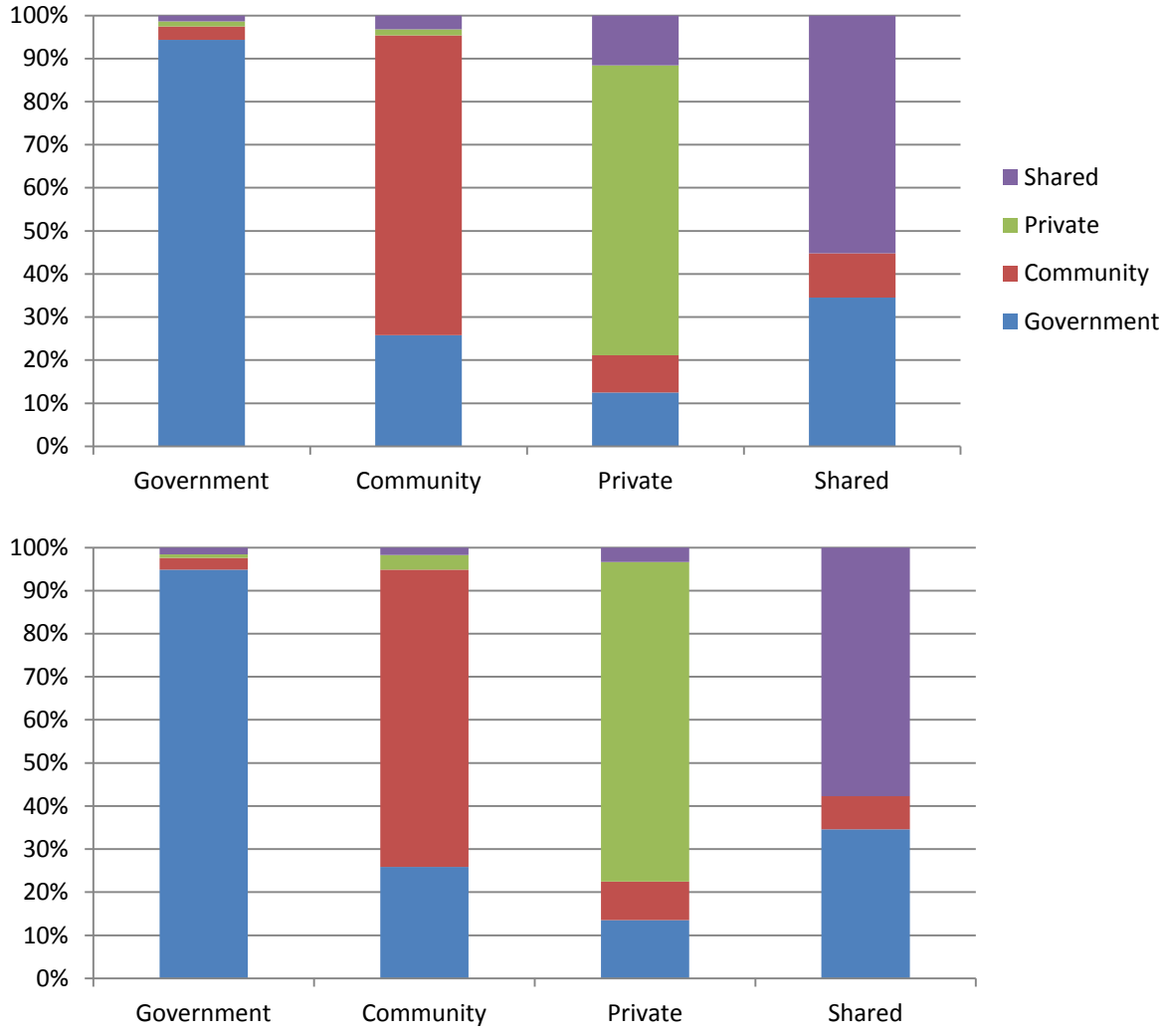


Figure 8. Percentage of PAs of each governance type found closest to a given PA, per governance type, excluding PAs for which the governance type has not been reported: a) using the 'most connected' method (upper section) and b) using the 'least connected' method (lower section).

As can be seen in Figure 8, regardless of the method used, it appears that different types of PA governance tend to cluster together, with PAs with a certain governance type found closest to PAs with the same governance type, be it state governance, community governance, private governance or shared governance.

Areas of biodiversity importance

Key Biodiversity Areas (KBAs)[2] have been defined as the most important sites for biodiversity conservation worldwide. They have been identified nationally using standard criteria based on their importance in maintaining species populations. As the building blocks of the ecosystem-based approach and maintaining effective ecological networks, KBAs are the starting point for conservation planning at landscape level. Governments, intergovernmental organizations, NGOs, the private sector, and other stakeholders can use KBAs as a tool for identifying national networks of internationally important sites for conservation. KBA includes globally important sites for different taxa and realms, including Important Bird Areas (IBAs) and the Alliance for Zero Extinction (AZE) sites.

AZE[3] is a network of biodiversity organizations from around the world who have developed three criteria, including (i) the presence of an Endangered or Critically Endangered species, (ii) the irreplaceability of the site, and (iii) distinct boundaries from the surrounding areas, to identify AZE sites, which highlight the most significant areas on earth where species are threatened with extinction due to habitat destruction or restricted ranges.

We found that 68.73% of the 1,343 areas of biodiversity importance (AZEs and KBAs) found in sub-Saharan Africa are at least partially included in a protected area (Figure 10 and Table 3). When looking at the proportion of AZEs and KBAs protected by different governance types, we found that almost a third (29.62%) was protected by a PA under state governance, which is more than the percentage of this governance type found in sub-Saharan Africa. This would tend to suggest that this governance type might be more efficient at protecting these areas, although more data would be needed to confirm this.

Governance type	Number of AZEs/KBAs	% of total number of AZEs/KBAs protected	% of PAs in total numbers
State	351	29.62%	20.77%
Shared	39	3.29%	0.64%
Private	29	2.45%	2.51%
Community	51	4.30%	3.62%
Not reported	715	60.34%	72.47%
Total Protected	**923* (68.73%)**	**100%**	100%
Total Not Protected	**420 (31.27%)**		
TOTAL	**1343**		

[2] Langhammer, P.F. et al (2007). Identification and Gap Analysis of Key Biodiversity Areas: Targets for Comprehensive Protected Area Systems. Gland, Switzerland: IUCN.

[3] www.zeroextinction.org

Table 3. Number of AZEs and KBAs protected by a protected area according to its governance type and not protected[4].

Looking at coverage, these areas of biodiversity importance cover a total of 2,335,704.2 km^2, including 98,993.6 km^2 of AZEs, which are entirely included within KBAs. We found that a total of 62.5% of the coverage of these KBAs/AZEs are protected (Figure 10 and Table 4). Excluding non reported governance types, the highest coverage is provided by PAs under state governance (45.4%), which is much higher than the average cover provided by this governance type, suggesting that state governed protected areas protect a higher proportion of KBAs/AZEs than other governance types. Furthermore, 52.0% of the coverage of PAs under state governance is found within a KBA/AZE, as well as 49.4% of PAs under shared governance and 23.4% of PAs under private governance.

Governance type	PA Coverage (km^2)	Overlap with KBA/AZE	% of PA found in KBAs/AZEs	% of KBAs/AZEs protected	% of KBA/AZE found in PA	% of PA coverage
State	1,273,123.2	661,650.8	51.97%	28.33%	45.36%	20.77%
Shared	117,451.8	58,002.0	49.38%	2.48%	3.98%	0.64%
Private	12,757.9	2,990.2	23.44%	0.13%	0.20%	2.51%
Community	232,277.4	17,466.8	7.52%	0.75%	1.20%	3.62%
Not reported	2,220,486.8	958,234.4	43.15%	41.03%	65.69%	72.47%
Total	**3,576,794.1**	**1,458,771.7**	**40.78%**	**62.46%**	**100.00%**	100%

Table 4. Overlap in coverage between AZEs/KBAs and PAs under different governance types.

[4] The total number of AZEs and KBAs protected per governance type adds up to more than the total number of AZEs and KBAs protected (923) because some of these areas are protected by more than one governance type.

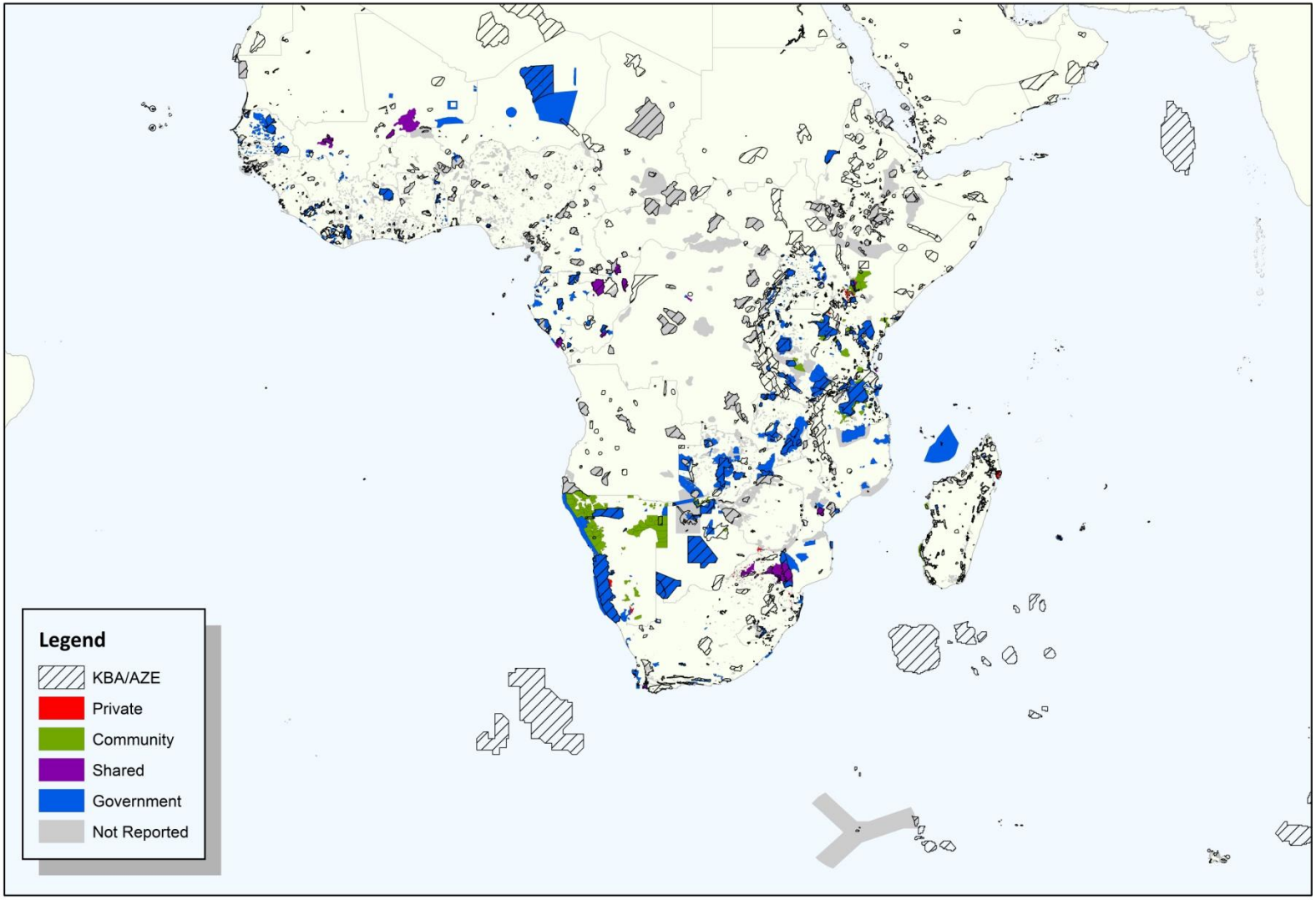


Figure 10. Protected areas under different governance types and their overlaps with AZEs and KBAs.

Animal diversity and threatened species

Animal diversity

We calculated the number of mammal, bird, and amphibian species that could be found in each PA by overlaying the PA boundaries with the recorded species ranges in the IUCN Red List of Threatened species. We then calculated the average number of species found by governance type (Figure 11). These numbers are however only indicative due to data limitations associated with species ranges and should not be interpreted as confirmed species numbers.

Governance type	**Mean, t-value and p-value**		
	Mammals	**Birds**	**Amphibians**
State	**119.1** **t=10.322, p<0.0001*****	**392.5** **t=9.966, p<0.0001*****	**24.5** **t=2.959, p=0.0031****
Community	94.6 t=43.201, p<0.0001***	321.5 t=48.849, p<0.0001***	21.9 t=26.566, p<0.0001***
Private	98.2 t=1.067, p=0.286	348.3 t=2.606, p=0.00917**	21.0 t=-0.697, p=0.4859
Shared	87.0 t=-1.346, p=0.178	305.2 t=-0.956, p=0.33906	20.4 t=-0.682, p=0.4951
Not Reported	107.7 t=5.857, p<0.0001***	373.2 t=7.670, p<0.0001***	**29.3** **t=8.809, p<0.0001*****

Table 5. Average number of mammal, bird and amphibian species found per protected area and ANOVA statistical tests.

Our statistical analyses (Table 5) suggested that state PAs might on average protect a higher number of mammal, bird and amphibian species than other governance types (when reported). However, this could be due to the fact that states PAs are often larger in size than PAs under other governance types. Furthermore, these results are based on the limited data available, and would need to be confirmed following data improvement on governance types.

Threatened animal species

Similarly, we calculated the number of threatened animal species that could be found in each PA by overlaying the PA boundaries with the recorded species ranges in the IUCN Red List of Threatened species classified as Critically Endangered, Endangered, or Vulnerable. We then calculated the average number of threatened species found by governance type.

Governance type	**Mean, t-value and p-value**		
	Threatened Mammals	**Threatened Birds**	**Threatened Amphibians**
State	3.85 t=-8.952, p<0.0001***	8.39 t=0.371, p=0.710419	0.30 t=-2.957, p=0.00312**
Community	**5.60** **t=31.003, p<0.0001*****	**8.30** **t=37.765, p<0.0001*****	**0.59** **t=6.491, p<0.0001*****
Private	3.92 t=-5.937, p<0.0001***	7.12 t=-3.422, p=0.00062***	0.12 t=-3.281, p=0.00104**
Shared	4.71 t=-1.899, p=0.0577	6.69 t=-2.836, p=0.00459**	0.22 t=-1.570, p=0.11637

Not Reported	3.57 t=-10.930, p<0.0001***	7.82 t=-2.113, p=0.03460*	0.44 t=-1.591, p=0.11165

Table 6. Average number of threatened mammal, bird and amphibian species found per protected area and ANOVA statistical tests.

Our statistical analyses (Table 6) seem to suggest that community PAs could protect on average a higher number of threatened mammal, bird and amphibian species than other governance types, however, again, these results are only based on available data and should be interpreted with caution, given the data limitations associated with species ranges and the fact that a large proportion of PAs have a non reported governance type.

Biogeographical regions

Table 7 and Figure 11 present the *number* of PAs per governance type in each biome, as defined by Olson et al. (2001), while Table 8 and Figure 12 present the *coverage* provided by PAs under different governance type. Figure 15 presents the overlap between PA governance types and biomes on a map.

Our results show that, compared with the proportion of PAs found in sub-Saharan Africa, a higher proportion of PAs under state governance are found in the Flooded Grasslands and Savannas biome and the Mangroves biome, and a lower proportion in the Tropical and Subtropical Dry Broadleaf biome and Montane Grasslands and Savannas biome; we also found a higher proportion of PAs under community governance in Deserts and Xeric Shrublands.

Looking at percentage coverage provided by different PA governance types, we also found that, compared with the percentage coverage of each PA type found in sub-Saharan Africa, in the Flooded Grasslands and Savannas biome, a higher coverage was provided by PAs under state governance, and a lower coverage was provided in the Montane Grasslands and Savannas biome. In addition, we also found a lower coverage provided by state governance to the Tropical and Subtropical Moist Broadleaf biome, and to the Mangroves biome, compared to the overall coverage provided by the different governance types.

Governance type	**State**	**Shared**	**Private**	**Community**	**Not reported**	**Total**
Tropical & Subtropical Moist Broadleaf	322 *20.7%*	15 *1.0%*	30 *1.9%*	62 *4.0%*	1130 *72.5%*	**1559** *100.0%*
Tropical & Subtropical Dry Broadleaf	8 *10.0%*	0 *0.0%*	0 *0.0%*	2 *2.5%*	70 *87.5%*	**80** *100.0%*
Tropical & Subtropical Coniferous Forests	0	0	0	0	0	**0**
Temperate Broadleaf & Mixed Forests	0	0	0	0	0	**0**
Temperate Conifer Forests	0	0	0	0	0	**0**
Boreal Forests/Taiga	0	0	0	0	0	**0**
Tropical & Subtropical Grasslands, Savannas & Shrublands	1015 *25.3%*	19 *0.5%*	129 *3.2%*	123 *3.1%*	2720 *67.9%*	**4006** *100.0%*
Temperate Grasslands, Savannas & Shrublands	0	0	0	0	0	**0**

Flooded Grasslands & Savannas	43 *27.7%*	3 *1.9%*	0 *0.0%*	11 *7.1%*	98 *63.2%*	**155** *100.0%*
Montane Grasslands & Shrublands	30 *5.6%*	1 *0.2%*	15 *2.8%*	0 *0.0%*	486 *91.4%*	**532** *100.0%*
Tundra	0	0	0	0	0	**0**
Mediterranean Forests, Woodlands & Scrub	39 *21.2%*	1 *0.5%*	2 *1.1%*	0 *0.0%*	142 *77.2%*	**184** *100.0%*
Deserts & Xeric Shrublands	49 *19.5%*	2 *0.8%*	3 *1.2%*	73 *29.1%*	124 *49.4%*	**251** *100.0%*
Mangroves	33 *29.5%*	5 *4.5%*	0 *0.0%*	3 *2.7%*	71 *63.4%*	**112** *100.0%*
TOTAL	**1539** **22.4%**	**46** **0.7%**	**179** **2.6%**	**274** **4.0%**	**4841** **70.4%**	**6879** **100.0%**

Table 7. Number of PAs per governance type in each biome. Colours indicate when the percentage of PAs found in each biome is more than 5% higher (in green) or lower (in red) than the total percentage of PAs found in sub-Saharan Africa.

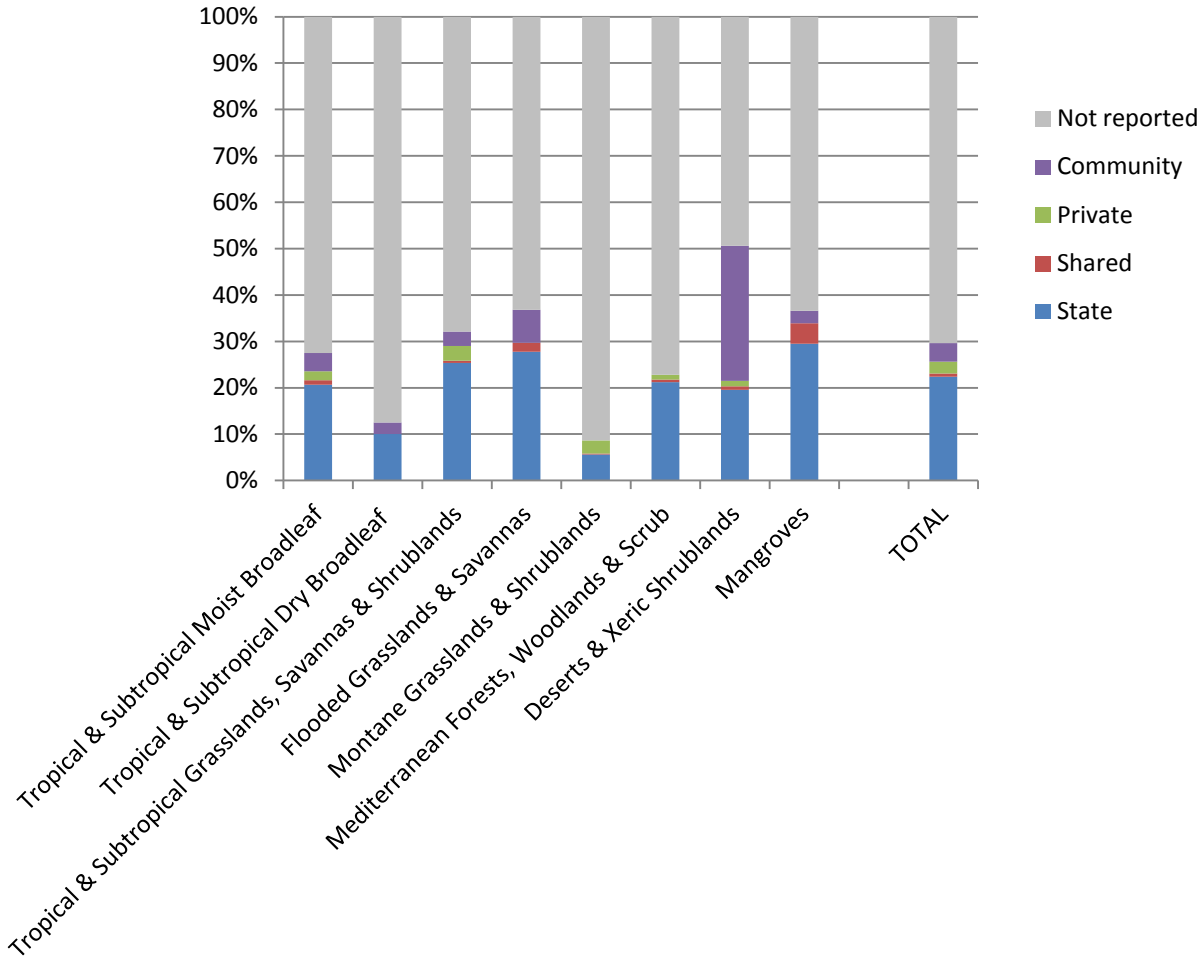


Figure 11. Percentage of the number of PAs found per governance type in each biome (when at least one PA per biome was found).

Governance type	State	Shared	Private	Community	Not reported	Total
Tropical & Subtropical Moist Broadleaf	100,308.1 20.1%	26,672.7 5.3%	2,947.5 0.6%	5,811.9 1.2%	413,199.2 82.6%	**500,206.8** 100.0%
Tropical & Subtropical Dry Broadleaf	4,557.2 29.1%	0.0 0.0%	0.0 0.0%	33.8 0.2%	11,950.9 76.2%	**15,677.4** 100.0%
Tropical & Subtropical Coniferous Forests	0.0	0.0	0.0	0.0	0.0	**0.0**
Temperate Broadleaf & Mixed Forests	0.0	0.0	0.0	0.0	0.0	**0.0**
Temperate Conifer Forests	0.0	0.0	0.0	0.0	0.0	**0.0**
Boreal Forests/Taiga	0.0	0.0	0.0	0.0	0.0	**0.0**
Tropical & Subtropical Grasslands, Savannas & Shrublands	671,752.6 *33.7%*	83,955.2 *4.2%*	6,687.2 *0.3%*	116,901.6 *5.9%*	1,217,062.7 *61.0%*	**1,995,626.7** *100.0%*
Temperate Grasslands, Savannas & Shrublands	0.0	0.0	0.0	0.0	0.0	**0.0**
Flooded Grasslands & Savannas	63,284.1 *56.0%*	250.5 *0.2%*	0.0 *0.0%*	2,033.5 *1.8%*	66,503.2 *58.8%*	**113,090.0** *100.0%*
Montane Grasslands & Shrublands	8,101.1 *8.6%*	3,033.2 *3.2%*	176.9 *0.2%*	0.0 *0.0%*	89,057.4 *94.5%*	**94,281.7** *100.0%*
Tundra	0.0	0.0	0.0	0.0	0.0	**0.0**
Mediterranean Forests, Woodlands & Scrub	8,655.4 *44.2%*	870.3 *4.4%*	17.9 *0.1%*	0.0 *0.0%*	13,398.1 *68.4%*	**19,599.3** *100.0%*
Deserts & Xeric Shrublands	319,358.5 63.5%	82.2 0.0%	2,906.1 0.6%	102,204.5 20.3%	174,420.4 34.7%	**502,697.3** 100.0%
Mangroves	4,412.6 *29.4%*	56.6 *0.4%*	0.0 *0.0%*	415.9 *2.8%*	11,734.1 *78.2%*	**15,010.7** *100.0%*
TOTAL	**1,180,429.5** ***36.3%***	**114,920.8** ***3.5%***	**12,735.7** ***0.4%***	**227,401.1** ***7.0%***	**1,997,325.9** ***61.3%***	**3,256,189.8** ***100.0%***

Table 8. Coverage (in km^2) provided to each biome by different PA governance types. Colours indicate when the percentage of PAs found in each biome is more than 5% higher (in green) or lower (in red) than the total percentage of PA coverage found in sub-Saharan Africa.

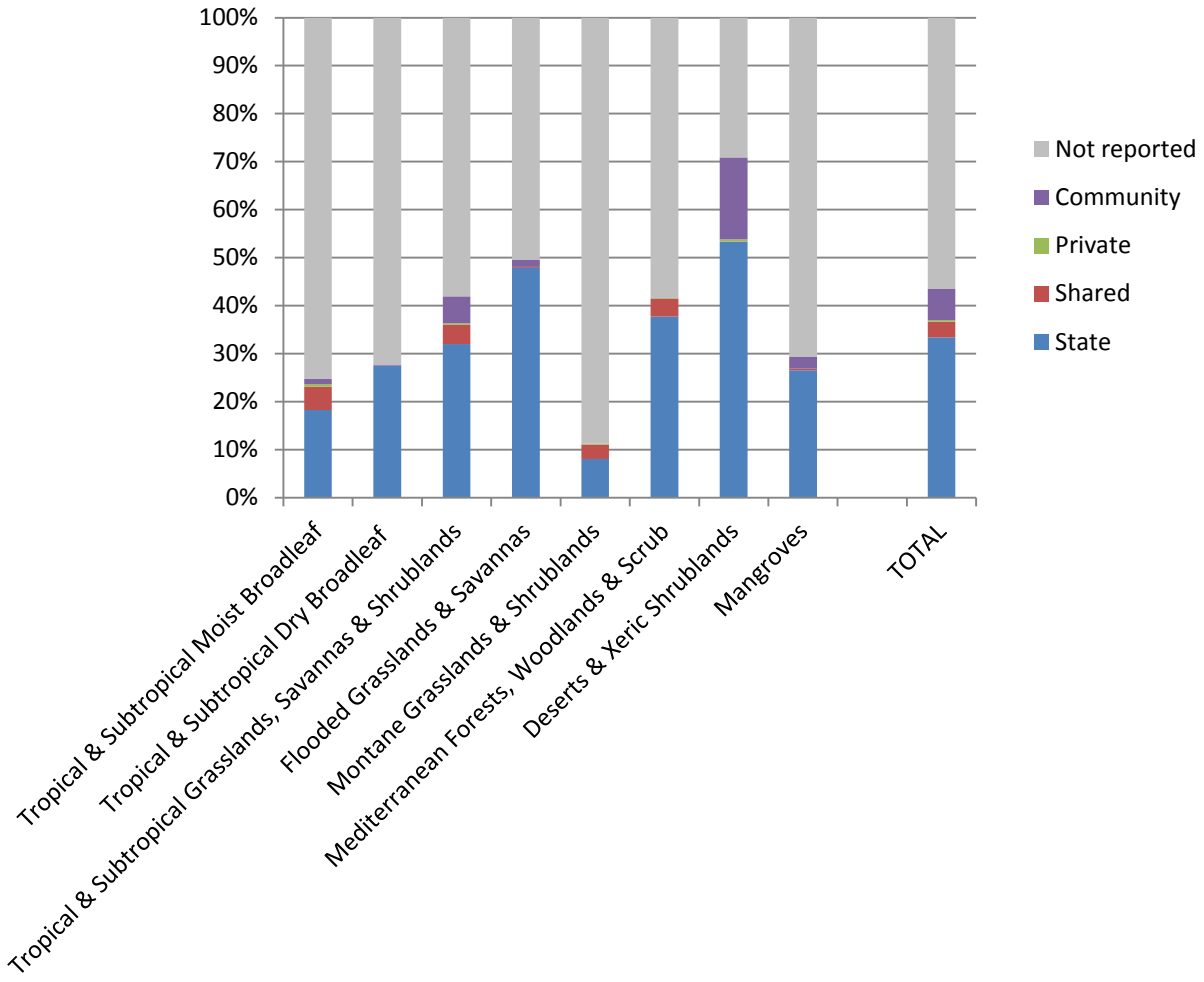


Figure 12. Percentage of PA coverage found per governance type in each biome (when at least one PA per biome was found).

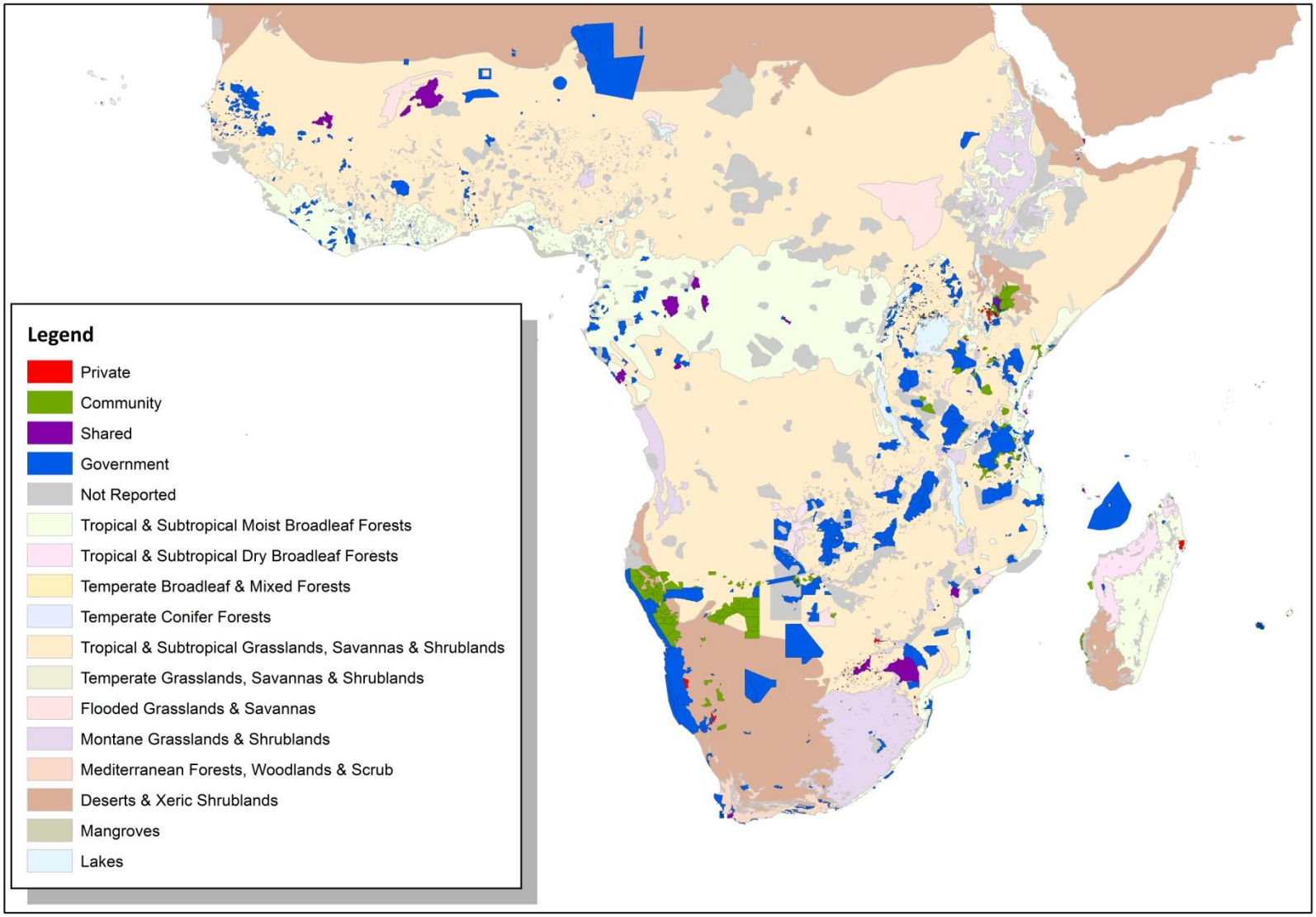


Figure 13. Protected areas under different governance types and biomes according to Olson et al. (2001).

3. Literature review

Introduction

Protected areas (PAs) have become a cornerstone of modern biodiversity conservation. Now covering over 15% of the world's terrestrial areas and inland waters and 3% of the oceans, PA coverage has significantly increased in the last decade (Juffe-Bignoli et al., 2014). Being recognized as a key strategy to protect the world's biodiversity and ecosystem services, governments worldwide have adopted a target through the Convention on Biological Diversity (CBD) to protect at least 17% of terrestrial areas and inland water and 10% of coastal and marine areas by 2020 (CBD Aichi Biodiversity Target 11).

While the importance of PAs to the preservation of global biodiversity is widely accepted, their ability to effectively meet such expectations is less consistent. Although PAs are known to have positive biodiversity values compared with alternative land uses (Coetzee et al., 2014), and tend to generally be effective in preventing deforestation within their boundaries (Naughton-Treves et al., 2005; Burner et al., 2001), significant declines in wildlife populations within PAs have also been recorded (Craigie et al., 2010; Western et al., 2009). A widespread erosion of the taxonomical and functional health of many PAs in the tropics has taken place, often caused by hunting and forest-product exploitation, habitat disruption and environmental changes occurring outside reserves (Laurance et al., 2012).

There is evidence that PAs do achieve biodiversity conservation outcomes on land and sea, especially regarding marine PAs and the conservation of forests (Juffe-Bignoli et al. 2014). However, given the current situation, it will not only be important to expand PA coverage, where possible, and to optimize spatial conservation planning, but considering the increasing competition for land and resources, it will be crucial for existing PAs to become more effective in their performance. PAs that are effectively managed according to the criteria established in various management assessment tools have been shown to contribute to both biodiversity conservation and to community well-being (Leverington et al., 2010). However, about 42% of PAs surveyed had major deficiencies and 13% showed very inadequate management, where basic activities are unlikely to be undertaken (ibid.), therefore leaving much room for improvement in PA management.

In addition to the widespread acknowledgement of the need for more effective PA management, there has also been a push to promote the effective governance of PAs. The common recognition that governance is a key factor in PA effectiveness is relatively recent, promoted in particular at the World Parks Congress in Durban in 2003, which put forth an Action Plan identifying governance as "central to the conservation of protected areas throughout the world" (WCPA, 2003). Governance, which refers to "the interactions among structures, processes and traditions that determine how power and responsibilities are exercised, how decisions are taken and how citizens or other stakeholders have their say" (Graham et al., 2003), is seen as crucial for effective and equitable conservation and as a main factor in determining the effectiveness and efficiency of management (Borrini-Feyerabend et al., 2013). Furthermore, as PAs have various multifaceted and context-dependent objectives apart from biodiversity conservation in the social-economic domain, it is important to focus on governance when trying to improve PA effectiveness in order to take into

account important institutional, economic or political changes in surrounding social-ecological systems that influence PAs (Macura et al., 2013).

PA governance has changed substantially over the past 30 years (Dearden et al., 2005), with an increasingly strong push to integrate the concept of social equity (Juffe-Bignoli et al., 2014). Today, the IUCN and CBD both recognize that PA governance can be grouped into four broad governance types, according to the key actors holding authority and responsibility for the main management decisions affecting the PA (Borrini-Feyerabend et al., 2013):

- Governance by government (at various levels);
- Governance by private individuals and organizations;
- Governance by indigenous peoples and/or local communities; and
- Shared governance (i.e., governance by various rights holders and stakeholders together).

This literature review provides an overview of the different types of governance that can be found across sub-Saharan Africa and describes them in their respective contexts. Following a general discussion of the types of governance and principles that contribute to good governance, this review will consider each governance type separately in the African context, identifying factors that have influenced the emergence of each type, as well as touching on strengths and weaknesses thereof, all of which should shed light upon elements that may have an impact on the quality of governance.

This literature review is a component of Study 0 "Governance of Protected Areas in Africa: Context, rules and stakeholders - a global review" and it is intended to provide an overview of governance types and the African context. Furthermore, three other studies also commissioned by IUCN (Studies 1, 2 and 3) each separately investigate in detail the different types of governance including case studies as well as describing lessons learned and conditions of success. This literature review will therefore cover the topic more broadly and provide overview information while using various examples from across the continent for illustrative purposes, as the other study sub-sections will thoroughly discuss each governance type in detail.

Governance types

In any given context, some form of governance is taking place as soon as decisions are being made and power and authority are being exercised (Borrini-Feyerabend et al., 2013) – in its essence, governance "is about power, relationships and accountability: who has influence, who decides, and how decision-makers are held accountable" (Graham et al., 2003). Governance is therefore a fundamental concept when considering the extent to which PAs can achieve their objectives, as the performance of a PA is shaped by countless questions surrounding the sharing of responsibilities, rights, costs and benefits, and the generation and maintenance of support – be it financial, political, or from the communities in and around the PAs in question (Borrini-Feyerabend et al., 2013). Furthermore, questions of PA governance often go beyond formal, traditional attribution of authority and responsibility and extend to customary and culture-specific institutions (Kothari, 2008). Accompanied by a shift away from state-driven conservation efforts to a focus on community inclusion (Agrawal and Gibson, 1999), the increasing influence of non-profit organizations in conservation (Sending and Neumann, 2006) and a proliferation of engagement in conservation initiatives by private parties (Jones et al., 2005), PA governance now often involves a much larger

number of stakeholders and participatory techniques than in the earlier days of PA governance (Dearden et al., 2005).

Due to such historical developments, today's governance arrangements in and around PAs can be very diverse. Nonetheless, four broad categories of governance have been established on the basis of who holds authority, responsibility and can be held accountable for the key decisions of PAs:

Governance by government

In this type, one or more government bodies (e.g., ministry or PA agency reporting directly to the government, or a sub-national or municipal body) hold the authority, responsibility and accountability for managing the PA, determining its conservation and developing and enforcing its management plan (Borrini-Feyerabend et al., 2013). In this arrangement, governments retain the overall control and make major decisions, but are able to delegate management tasks to other actors (ibid.). This form of exclusive, top-down governance was the norm for most PAs until the 1980s and 1990s, when a paradigm shift occurred towards the involvement of local communities in natural resource management (Büscher and Dietz, 2005). With this shift towards increased decentralization of power in PA governance, the lines between governance types now often become quite blurred (Borrini-Feyerabend et al., 2013).

Governance by private actors

Private governance comprises PAs under individual, NGO, research body, religious institution or corporate control and/or ownership over resources. A broad range of private reserve types exists, such as ecotourism reserves, biological stations, hybrid reserves, personal retreat reserves or hunting reserves, representing numerous ownership structures and management objectives (Langholz and Krug, 2004). Furthermore, in privately governed PAs, land does not necessarily need to be owned by the private conservation enterprise that makes management decisions, and various types of management arrangements can be in place in such areas (Carter et al., 2008). Due to this variety of ownership categories and stakeholders, there is some overlap with the other governance types, which can be confusing when trying to distinguish between them, but efforts have been made to develop a typology for privately governed PAs in order to help better differentiate the various types (ibid.). A recent report on privately protected areas published by IUCN defines a PPA as a protected area, as defined by IUCN, under private governance, and provides guidance on the application thereof and recommendations for increasing use and effectiveness of this governance type (Stolton et al., 2014).

Governance by indigenous peoples and local communities

IUCN defines this governance type as "protected areas where the management authority and responsibility rest with indigenous peoples and/or local communities through various forms of customary or legal, formal or informal, institutions and rules" (Borrini-Feyerabend et al., 2013). An effective governance regime under this type implies that the indigenous peoples or local communities possess an institutional arrangement that allows them to make decisions and to develop rules for the land, water and natural resources (ibid.). PAs that fall under this category can take various forms, such as Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs), sacred sites and ancestral domains, group ranches conserving wildlife, or native territories

managed as wilderness areas. The IUCN Guidelines for Protected Area Legislation make clear that governance is a separate consideration from tenure "although tenure is important when considering the appropriate governance approaches for a particular site" (Borrini-Feyerabend et al., 2013).

Shared governance

As participation in PA governance by multiple actors has increased (Dearden et al., 2005), an increasing number of PAs now falls under shared governance, in which authority and responsibilities are shared amongst several actors, such as the state, indigenous communities that depend on the area culturally or for their livelihoods, and private entrepreneurs or landowners. According to Borrini-Feyerabend et al. (2013), true shared governance should have "a negotiation process, a co-management agreement (e.g., an agreement describing roles, responsibilities and expected benefits and contributions from different parties) [and] a multi-party governance institution." Shared governance settings are usually dynamic and evolving, demanding on-going innovation, negotiation and adaptability (ibid.).

Governance principles

Alongside efforts to better define and understand PA governance, in recent years, more attention has been paid to reflecting upon principles that may lead to good governance (Lockwood, 2010). Principles of good governance are intended to help understand the quality of PA governance and are a measure of how far certain principles and values are adhered to (Borrini-Feyerabend et al., 2013). Despite the difficulty of defining criteria of good governance due to the multitude of cultural contexts and worldviews, Graham et al. (2003) have developed a set of principles (Legitimacy and voice, Direction, Performance, Accountability, Fairness and rights) and sub-criteria they consider relevant and applicable in a wide range of circumstances; the authors have highlighted, however, that these criteria do not provide a formula for the best governance approach in a given situation. IUCN has incorporated additional work and field experience into Graham et al.'s principles, providing further considerations related to each of the principles.

Borrini-Feyerabend et al. (2013) also emphasize that these principles should be viewed as a benchmark and applied flexibly according to context rather than being used as a prescribed formula for any context. As do other scholars (Macura et al., 2013; Dearden et al., 2013), Borrini-Feyerabend et al. (2013) highlight that "there is no 'ideal governance setting' for all protected areas, nor an ideal to which governance models can be compared, but a set of 'good governance' principles [that] can be taken into account vis-à-vis any protected area system or site." Nonetheless, further investigation into the link between factors affecting governance and the desired biodiversity outcomes could potentially identify some commonalities. Such work has not yet been done in a systematic way, but Macura et al. (2013) are currently undertaking a systematic review with the aim of assessing relative effectiveness of forest PAs worldwide with respect to different governance modes and linking them to the multiple outcomes in order to discern the effective governance strategies for biodiversity and forest conservation. The study will evaluate effectiveness of forest PAs through multiple outcome measures: (1) attitudes of local stakeholders towards forest PA governance; (2) conservation-related behavior of local stakeholders; (3) ecological parameters such as forest cover, biodiversity level, density, overall forest condition and/or health; and (4) existence of local spillover effects defined as

social, institutional and ecological effects in surrounding social-ecological systems. The authors hypothesize that: “(H1) making decisions at lowest level possible, (H2) collective or multi-actor decision making, (H3) high level of proactive participation in day-to-day decision-making and (H4) multilevel collaboration among stakeholders can lead to more positive attitudinal, behavioural and ecological success of PAs and decrease negative spillover effects around them” (Macura et al., 2013).

Protected area governance in sub-Saharan Africa

All four governance types defined in the previous section can be found across sub-Saharan Africa. Each will be discussed in the following sections, highlighting factors that have influenced their emergence, as well as providing a brief overview of their strengths and weaknesses, which should bring to light elements that may have an impact on the quality of governance.

1. Governance by government

1.1 Contextual influences

Governance of PAs by the state is the most common model of governance throughout sub-Saharan Africa (see Section 2), and this is reflected globally (Juffe-Bignoli et al., 2014). The prevalence of state-governed PAs originates from Africa's colonial past. While various forms of informal conservation and sustainable use of natural resources had certainly been practiced by local populations for centuries (DeGeorges and Reilly, 2009), steps towards introducing formal measures of conservation were not taken until the late 1800s under European colonial regimes. After the introduction of firearms and ideals of a strong market economy by European colonialists, levels of wildlife exploitation skyrocketed, nearly decimating certain wildlife populations in many parts of Africa (Carruthers, 1995; MacKenzie, 1997). In response to this, game legislation was introduced in various parts of Africa and colonialists signed a conservation treaty in 1900 to protect African wildlife (DeGeorges and Reilly, 2009).

Furthermore, accompanying the changing perceptions of nature in the West during the nineteenth century leading to a desire to protect valued natural attributes rather than simply exploiting them, Africa's first national park was created in Belgium Congo in 1925 (Jepson and Whittaker, 2002). In 1933, the London Conference on African Wildlife brought together delegates from colonial powers with territories in Africa, which produced an international agreement on PAs, designating two types thereof: national parks and strict nature reserves (ibid.). This marked the beginning of an era of nature conservation dominated by principles of strict separation of humans and nature. The core elements of such 'fortress conservation' consisted of the establishment of PAs, which excluded people and limited or forbid their rights for consumptive use, together with strict enforcement of these rules through a 'fences and fines' approach (Adams and Hulme, 2001a). This often involved relocating communities out of areas in which they had lived for generations, creating many PAs with adjacent border communities living in poverty (Hulme and Murphree, 2001).

As the creation of PAs first took place under colonial regimes, the power to govern them was naturally vested in the state. A strict separation between the authorities, local communities and wildlife was imposed, "glossing over any kind of responsibility about early wildlife depletion and severing any sense of community ownership or responsibility for natural resources" (Borrini-Feyerabend and Sandwith, 2003). Such colonial force therefore was the primary means by which the new PA network was established.

When many African countries started gaining their independence from the 1950s onwards, this top-down form of PA governance was inherited, along with many other colonial models of government.

Many African states have continued to focus their attention on trying to establish or expand effective authority through formal rule mechanisms within the boundaries bestowed upon them by colonial rule (Büscher and Dietz, 2005). This has often included further centralizing control, such as in much of West and Central Africa, for example, where tenure rights became even more centralized accompanying greater political and economic centralization brought about by socialist ideologies (Roe et al., 2009) or the need to consolidate power under military rule (Ribot, 2002). Such trends are likely to have contributed to the continued existence, expansion and creation of PAs that are under state governance in the sub-Saharan African context.

Since the 1980s and 1990s, however, there has been an increasing shift away from 'fortress conservation' towards a model that aims to include people in the protection of the environment (Adams and Hulme, 2001b; Agrawal and Ribot, 1999; Larson and Soto, 2008). Around 12% of forests worldwide are now managed with some form of popular participation, including at least 21 countries in sub-Saharan Africa that officially promote variations of participatory natural resource management, often taking the form of community-based natural resource management (CBNRM) (Ribot et al., 2010). CBNRM has grown in popularity as, in theory, it represents an ideal tool to simultaneously address conservation and development issues. Resting on democratic principles, CBRNM strives to improve environmental management while increasing equity and justice for local people who, through their empowerment, become reliable stewards of the environment while improving their livelihoods (Matose and Watts, 2010; Mohan and Stokke, 2000; Murphree, 2009; Kellert, 2000). Furthermore, CBNRM has continued to gain widespread international support as a continuing loss of important biodiversity as well as an exacerbation of poverty has been well documented, creating a sense of urgency (Millennium Ecosystem Assessment, 2005). In addition to this international push towards more inclusive conservation, Africans have themselves been advocating more inclusive approaches to governing natural resources in a time where powers have been returned to the majority. This can be observed, for example, in the cases of land restitution claims being made in national parks (Carruthers, 2007; Derman, 1995).

Despite this movement towards shared and community governance, the state often retains the highest level of authority and holds greatest decision-making powers, even in PA arrangements that do not officially fall under the governance by government model. The case of the Southern African Great Limpopo Transfrontier Park (GLTP) between South Africa, Zimbabwe and Mozambique demonstrates this continued dominance of the state. Since the early stages of negotiation in 1996, governments have controlled the process of establishing this transboundary PA, which ideally should provide a prime example of shared PA governance as it involves a multitude of different stakeholders across borders (Büscher and Dietz, 2005). Rather than establishing a supportive partnership with communities and NGOs, governments left these actors on the sidelines, deciding to skip foreseen consultative processes through community committees or working groups (Metcalfe, 2003; Büscher and Dietz, 2005). Munthali and Soto (2001) even conclude that "besides the government, none of these stakeholders [communities, NGOs, private sector organizations] effectively participated in the process leading to the establishment of the GLTP."

Many African states also often maintain ultimate control of PA governance through shortfalls in decentralization policies and rights to natural resources, even when responsibilities and decision-making powers are meant to be shared or fully devolved to communities. Decentralization can be defined as "any act by which central government cedes powers to actors and institutions at lower

levels in a political-administrative and territorial hierarchy" (Roe et al., 2009, in Ribot, 2004) and has been identified as being key to effective CBNRM, for example, as in order for a community to manage its own resources effectively, it must have sufficient control over its natural environment (Child and Barnes, 2010; Nelson and Agrawal, 2008; Nelson et al., 2007; Kellert, 2000). Despite the fact that most African countries do have decentralization policies in place, these policies more often a form of 'deconcentration', not democratic decentralization, meaning that communities would not have full authority over resource management decisions and uses (Murphree, 2009; Nelson and Agrawal, 2008; Ribot, 2002) (see section on governance by indigenous peoples and communities for discussion on importance to that governance model). Such shortfalls in decentralization policies yet again allow for states to retain high levels of control in PA governance. Furthermore, central governments often retain rights over the most lucrative resources, be it land or wildlife, in order to control the main channels of revenue generation (Conyers, 2000; Matose and Watts, 2010; Nelson and Agrawal, 2008). This is particularly common in the forestry sector (Larson and Soto, 2008; Ribot et al., 2010). The failure to uphold democratic principles of accountability and transparency in natural resource management can also easily lead to misappropriation and misallocation of funds and corruption amongst government officials (Brockington, 2008). Such policies are likely to encourage governments to maintain control of PA governance.

A history of colonialism, Western ideals of nature conservation and times of decolonization shaped by centralization and perhaps questionable accountability and general governance practices, have allowed for PAs under state governance to come into existence and continue to develop until modern days. These influential contextual elements have even led to states often retaining more control than is desired. Arguably, however, PAs governed by governments are, or will, increasingly transform into some degree of shared governance.

1.2 Strength and weaknesses

Strengths

The key strengths of PAs governed by states are related to their ability to often cover large areas of land with a high level of authority. Compared to the other types of governance, PAs under state governance often tend to cover larger pockets of land (see Section 2), which have the ability to safeguard greater amounts of species and maintain intact habitats as well as maintain ecosystem services (Ladle et al., 2011). Due to having a higher level of authority and access to law enforcement, PAs governed by the state can also have the power to act legally against encroachment into PAs. A study from East Africa investigating PA effectiveness at local, landscape and national scales, comparing rates of deforestation within park boundaries with those detected in park buffer zones and in unprotected land more generally, found that the most successful PAs were national parks, although only 26 out of 48 parks increased or maintained their forest area (Pfeifer et al., 2012).

PAs governed by the state also have the potential to create benefits for surrounding communities. For example, research examining local communities' perceptions of contributions of the Okwangwo Division of the Cross River National Park in Nigeria discovered that communities living in close proximity to the PA were benefitting from infrastructure such as town halls, a bridge and a classroom block, from income from tourism and employment, and that the park management

contributed to the provision of electric power supply and a water bore-hole (Ezebilo and Mattsson, 2010). However, such benefits may reach communities unequally, such as those living closest to park management, and while it may be unrealistic to expect the park management to solve all socio-economic problems to the satisfaction of local people, more involvement of local communities management planning and monitoring of the park may increase their support for the park (ibid.). This case, of course, merely represents one example the type of benefits this particular PA has provided to surrounding communities but may not be particularly attributable to state-run PAs overall (see Study 3 for further discussion).

The above mentioned benefits may are not be representative of all state governed PAs, however, and they do not guarantee full protection: species can move outside PAs, other pockets of valuable biodiversity might lie outside PA boundaries (Western et al., 2009), and encroachment still occurs, both in the form of deforestation and hunting, also affecting ecosystems that lie beneath intact forest canopies (Laurence, 1999; Wilkie et al., 2011; Bennett et al., 2002). Furthermore, while PAs governed by the state can certainly create benefits for local communities, they have been widely criticized for not doing so – and even for imposing substantial costs on local communities – in particular by those advocating the devolution of power over natural resources to communities.

Weaknesses

Through the call for shared power and increased community and multi-stakeholder involvement, many weaknesses of top-down, exclusive PAs have been highlighted in the literature. By prohibiting access to PAs, communities living in or around PAs are faced with many difficulties. In extreme cases, communities can be evicted or displaced from the park (Brockington and Igoe, 2006). Furthermore, restricted access to forest products (Cernea and Schmidt-Soltau, 2006), fire wood (Ongugo, 2002), land and employment (Bedunah and Schmidt, 2004), can have negative consequences on communities, in particular when considering that an estimated 90% of the world's poor depend on forests for at least a portion of their income (World Bank, 2000; Scherl et al., 2004; USAID, 2006). In Africa alone, 600 million people have been estimated to rely directly and indirectly on forests for their livelihoods (Anderson et al., 2006).

While a recent review of the effectiveness of PAs has suggested that more restrictive PAs are more successful in reducing deforestation than those with less restrictive access (Clark et al., 2008), where disempowered communities remain within or around the PA, and when forest laws are weakly enforced, compliance with restrictions on resource use is less likely (Ongugo, 2002; Bedunah and Schmidt, 2004; Scherl, 2004). Conventional, top-down PA practices often found in PAs governed exclusively by the state can therefore backfire on conservation efforts through retaliatory action by disempowered communities, conflicts with PA managers, and the inability to use the knowledge and practices of local people (Kothari, 2008). In the South African Hangberg Marine Protected Area (MPA), which was established in 1934, for example, fishing communities have been dispossessed of their fishing rights for the past seventy years, which has resulted in significant animosity toward the state and a complete disregard for its rules (Sowman et al., 2011). There has been no engagement or consultation between the fisheries authority and the fishers, and thus potential alternatives to the current management of the PA have not been explored. The long-term implications have been significant, including an impoverished community, a thriving informal or illegal fishery and an eroded

sense of legitimacy toward the state (ibid.). State-driven MPA planning in Mozambique has created a similar situation with groups and communities interviewed being at best ambivalent towards MPAs and even materially harmed by the creation of MPAs that restrict fishing (Rosendo et al., 2011).

1.3 Concluding remarks

PAs governed exclusively by the state certainly play a crucial role in the conservation of biodiversity as they are the most common form of PAs, covering vast areas ecological importance, and without these PAs, there would be proportionally less biodiversity conservation. The governance of these PAs is not ideal, however, as many such areas do not seem to be adhering to many of the principles of good governance (see previous section). According to these principles and based on the literature, one of the key factors affecting the quality of state PA governance is the degree of exclusion of other stakeholders. As Vedeld et al. (2012) have put it: “Parks tend to live their own lives; they reshape and change the land use patterns and people surrounding the park. As a social institution and political construct, it both attracts and evicts people, changes relative prices, constrains resource access and alienates people from nature and alters rights and power relations.” They also highlight the fact that such failures are not necessarily only caused by corruption or unequal power relations, but that the lack of efficient delivery systems of public goods and the financial constraints faced by PAs limit their ability to function effectively (ibid.). To improve state-governed PAs, a shift towards shared governance models would be needed in which top-down, centralized, authoritative principles from the past are abandoned, in particular where PAs have the potential to generate substantial benefits for other stakeholders justifying their participation in management.

2. Governance by private actors

2.1 Contextual influences

PAs governed by private entities are highly diverse due to the many types of actors that can be involved and the various types of ownership and management that can exist. In sub-Saharan Africa, many privately protected areas (PPAs) take the form of private game ranches, private nature reserves and private conservancies such as groups of commercial farms, livestock farms, mixed wildlife-cattle ranches or game ranches, where neighboring landowners (either individual or communal) can pool natural and financial resources for the purpose of conserving and sustainably utilizing wildlife (Jones et al., 2005). To distinguish PPAs from other land uses that may also have high wildlife value, IUCN recommends the following definition: *a privately protected area is a protected area, as defined by IUCN, under private governance (i.e. individuals and groups of individuals; non-governmental organizations (NGOs); corporations – both existing commercial companies and sometimes corporations set up by groups of private owners to manage groups of PPAs; for-profit owners; research entities (e.g. universities, field stations) or religious entities).* Not all private conservation initiatives can or should become PPAs, although some initiatives that are not currently PPAs could become so with minor changes in management and emphasis (Stolton et al, 2014).

Until the IUCN publication, there has been no common definition for such diverse PPAs (Carter et al., 2008) and it has therefore been difficult to quantify exact numbers (Langholz and Krug, 2004). Nonetheless, it is evident that there has been a proliferation of the different types of PPAs in Africa over the past 20 years or more, in particular in Eastern and Southern African countries (Jones et al., 2005), as seen in Section 2. Carter et al. (2008) found that, in Kenya, PPAs have been recorded to cover a total area of 797,068 ha, which represents 1.4% of the terrestrial land area, while 4.5 m ha of land is officially gazetted as protected by the state (8%). In South Africa, there are an estimated 55,000 private farms and ranches with important wildlife values, many of which fall outside the IUCN definition of a protected area (Kreuter et al., 2010). This area of private land supporting wildlife comprises about 14% of South Africa's land area, compared to 6.3% declared as formal conservation areas (ibid.).

The high abundance of PPAs in East and South Africa compared with PPAs recorded in other parts of Africa (see Section 2) can likely be attributed to various contextual elements that create conditions favorable to the development of PPAs. In East Africa, for example, most privately conserved areas are in Kenya and Tanzania, partly because large areas of suitable wild habitat, although under threat, still exist outside state governed PAs (Jones et al., 2005). Furthermore, the natural features that characterize the landscapes of many Eastern and Southern African countries, such as open savannahs and easy access to large mammals, are favorable to developing markets for wildlife. Therefore, economic forces trying to develop markets for wildlife products and nature tourism have promoted the establishment of private parks, private game ranches and community-based conservation initiatives (Jones et al., 2005). Across Southern Africa, in particular, market forces have driven this move towards considering wildlife as a land use (Suzuki, 2001; Wels, 2004; Jones et al., 2005).

Conservation objectives, such as the protection of endangered species, have also played an

important role in the development of PPAs. This has largely led to, for example, the establishment of conservancies on freehold land in Kenya and several countries in southern Africa (Jones et al., 2005). As Jones et al. (2005) have noted, the Lewa Wildlife Conservancy in Kenya's Meru District covers about 42,500 ha and contains important populations of black rhino *Diceros bicornis* and white rhino *Ceratotherium simum*. The conservancy itself is part of the Laikipia Wildlife Forum, of which the primary objectives are the maintenance of ecosystem integrity and processes, the establishment and development of community conservation projects in wildlife dispersal landscapes and the development of wildlife enterprises (ibid.). A number of group ranches have adopted various forms of conservation management on all or part of their ranches, such as the Kimana Community Wildlife Sanctuary, which is located in a critical wildlife corridor between the Amboseli and Tsavo West National Parks in Kenya, as well as the Ngwesi Group Ranch, which lies to the north of the Lewa Wildlife Conservancy and forms an important area for wet season movement of wildlife from the conservancy (ibid.). The conservancy has assisted group ranch members in establishing a company to generate income for the community from wildlife-based tourism. Some group ranches in Kenya have also formed Wildlife Associations in recognition of the need for extensive range areas to make wildlife a sustainable form of land use (ibid.). Additionally, the Ol Chorro Oiroua Wildlife Association was formed in 1992 by individual Maasai landowners in the northern part of the Mara-Serengeti ecosystem. It aims to protect the northern wildlife dispersal areas of the Maasai Mara Reserve against encroachment by crop farming, and the association is reported to have been successful in halting habitat loss and in demonstrating that wildlife can earn significant incomes as part of an integrated land use approach (ibid.).

Another element that has certainly been essential to the establishment of many PPAs, and that goes hand in hand with the growing popularity of wildlife-based markets and wildlife-based land use, is the existence of legislation and policies enabling private entities to benefit from wildlife. A key driver of the development of wildlife industries in South Africa and Zimbabwe, for example, was legislative change introduced in the 1980s and 1990s that allowed private landowners to utilize and manage wildlife on their land without government permits (Kreuter et al., 2010). In Botswana, Namibia, South Africa and Zimbabwe, dual tenure systems are in place where large areas of land under communal tenure are also held under freehold title (Jones et al., 2005). Such freehold land was historically developed for cash crop farming and/or livestock ranching but many freehold farmers have moved to mixed livestock and wildlife ranching or exclusively to wildlife ranching (ibid.). Furthermore, eco-tourism companies have bought large tracts of freehold land and developed them for wildlife- and wilderness-based tourism (ibid.). Some freehold farms are now also operated as game ranches where the land is used exclusively for the production of wildlife for consumptive and non-consumptive use and others are combined into large conservancies (ibid.).

Tenure regimes in Kenya and Tanzania have also facilitated the creation of PPAs. In Kenya, 25% of PPAs are held under long-term individual ownership, which are predominantly held by descendents of European settlers (Carter et al., 2008). 16% of the remaining PPAs are under state ownership in areas such as Trust Lands, which are decreed under the Trust Land Act (Cap288) of 1939 (ibid.). In Tanzania, all land is ultimately owned by the state and can only be leased by companies for set periods of time, up to 99 years. There are also cases in which PPAs have been created through an informal arrangement whereby a local community rents their land to a private sector conservation enterprise on a yearly basis for a set fee (ibid.) In Mozambique and Zambia, private individuals and

companies are also able to lease land from the government for farming activities; however, only leased land that is marginal for livestock or crop farming is being used for wildlife (Jones et al., 2005).

Favorable government policies have also promoted conservation through different forms of private protection. In Tanzania, for example, government policy encourages the establishment of Wildlife Management Areas (WMAs) on community land with the aim of promoting wildlife conservation outside government conservation areas and to transfer management to local communities in corridors, migration routes and buffer zones (Jones et al., 2005). Furthermore, in South Africa, certain policies have encouraged the creation of PPAs. The National Parks Act of 1976, for example, allowed for private land located next to national parks to be designated as a ''contracted national park'' (Kreuter et al., 2010). Landowners, who participate in this, can obtain access to larger wildlife populations, thereby increasing their potential for developing wildlife tourism enterprises (ibid.).

Other innovative policy incentives are offered in South Africa, which may entice private landowners to engage in conservation, thus extending the network of PPAs. The Conservation Stewardship Program (CSP), initiated in 2003, aims to cost-effectively conserve species and ecosystems in priority conservation areas by entering into conservation agreements with willing private landowners who choose between legally nonbinding (informal) and legally binding (contractual) agreements (Von Hase et al., 2010). The Biodiversity and Wine Initiative (BWI), which is a partnership between the South African wine industry and nongovernmental conservation organizations, seeks to limit further loss of endangered vegetation in the Cape Floral Region (CFR) by encouraging sound conservation and environmental practices as part of sustainable production of wine grapes (ibid.). Members sign a voluntary conservation agreement that places few restrictions on land uses and that equate to the legally nonbinding agreement under the CSP (ibid.).

Many Southern and Eastern African contextual elements have facilitated and even encouraged the development of PAs governed by private entities. Where such conditions have not been created by governments and, possibly, where natural environments do not lend themselves as easily to wildlife-based markets, therefore also encouraging government policies to create favorable land tenure legislation, it may be more difficult for PPAs to become established. Such considerations may potentially explain the lower abundance thereof in West and Central Africa.

2.2 Strength and weaknesses

Ecological

A key strength of privately governed PAs that has been identified in the literature is their protection of biodiversity. For example, a study by Gallo et al. (2009) performed a gap analyses for a large semi-arid region in South Africa with a comprehensive database of private conservation areas, comparing the distribution of private conservation areas (PCAs) to statutory conservation areas (SCAs) using several landscape characteristics and assessing conservation target achievement for the vegetation variants. The results showed that PCAs conserved nearly twice as much land as SCAs in the Little Karoo ecoregion, and led to nearly three times as many conservation targets being met. Further, they conserved markedly different types of habitat than SCAs, adding to the protection of important habitat types that lie outside the official PA system (ibid.). PPAs can also be seen as “temporary way

stations" for threatened lands, "protecting them until governments become willing or able to assume responsibility for protection" (Langholz and Krug, 2004). Another study that conducted interviews with key stakeholders working within conservation and wildlife ranching in South Africa, found that benefits provided to conservation from wildlife ranching seem to be well accepted by many working within the industry (Cousins et al., 2008).

PPAs have also been reported to protect rare or threatened species. Species such as black rhino are being protected on private land by individuals, companies, and communities in Kenya and Namibia, and many PPAs have viable populations of species such as elephant and large predators (Jones et al., 2005). Goodman et al. (2002) found that two endemic plant communities, which are not present in the formal network of protected areas in KwaZulu-Natal, are being supported by wildlife ranching. Furthermore, it is believed that PPAs are often established adjacent to government reserves, which allows for species roaming off the latter to remain protected in PPA territory (Jones et al., 2005), however, this is not found in our spatial analyses in Section 2.

A number of potential disadvantages of PPAs from an ecological point of view have also been noted. While some PPAs in Southern Africa may have legally binding charters that focus on long-term conservation, for example, most private protected areas are informally protected, which makes them seem impermanent compared to state reserves (Langholz and Krug, 2004) and means that they are often not officially reported (as also mentioned in Section 2). Change in ownership also adds to this sense of impermanence (Jones et al., 2005; Mitchell, 2005). Furthermore, the typically small size of PPAs (see Section 2) might limit their effectiveness in protecting large species (ibid.). As PPAs are often incentivized by ecotourism or game hunting, private owners may also artificially alter species compositions and too intensely manage wildlife to make their PPAs more attractive, sometimes even persecuting predators to protect valuable game (Cousins et al., 2008). Like any protected area dependent on tourism income, PPAs are vulnerable to sudden events, such as risks of terrorism or concern about diseases such as Ebola, in this case without the safety net of government support.

Economic

PPAs have been shown to be particularly effective in capturing the economic value of biodiversity, thereby making conservation a financially competitive land use. Especially when used for ecotourism or sustainable wildlife utilization, reserves represent a livelihood strategy that can have both economic and ecological viability (Langholz and Krug, 2004). A study analyzing the socio-economic significance of private game reserves in the Eastern Cape Province with particular emphasis on ecotourism found that: (i) in changing from farming to wildlife-based ecotourism, employment numbers increased by a factor of 3.5, the average value of wages paid per reserve increased by a factor of 20, and the average annual salary more than quintupled from $715 to $4,064 per employee; (ii) the reserves were contributing in excess of $11.3 million to the regional economy per year; and (iii) reserves were making a substantial contribution to biodiversity conservation (Sims-Castley et al., 2005). Data gathered from 32 managers of private reserves across sub-Saharan African and Latin America also confirmed that reserves can indeed be a profitable venture (Langholz, 1996).

While tourism in PPAs can generate important revenues, relying on ecotourism and external markets for game can be risky as tourism is an industry vulnerable to wide fluctuations in external factors – terrorism, political unrest, natural disasters, and other factors can deter clientele from visiting PPAs, which represents limits to the private sector approach (Langholz and Krug, 2004).

Sociopolitical

Effective PPAs have the potential to address many sociopolitical issues present across sub-Saharan Africa while meeting conservation goals. Trying to address the two realms, private parks and conservancies, such as Phinda in South Africa, Gondwana in Namibia, and Lewa in Kenya, have placed considerable emphasis on providing benefits to poor neighboring communities (Jones et al., 2005). These benefits have become apparent in the form of jobs, contributions to schools and other social welfare activities, as well as in the form of assistance to communities in managing their own conservation areas (ibid.). Indeed, as Langholz and Krug (2004) have noted, PPAs "overlap with two important social themes in conservation-devolution of resource control and public participation in resource decision-making", which puts PPAs in a good position to provide social benefits and even represent an "extreme form of participation in protected area management, where the local residents who own reserves control decision-making and there is no real or broader local participation in it."

PPAs have a number of potential weaknesses as well with regards to their social contributions. There are risks that PPAs can contribute to the concentration of already wealthy landowners and elites without developing meaningful links to communities (Langholz and Krug, 2004). Brinkate (1996), for example, reported that some wealthy landowners in South Africa were declaring their lands as conservation areas in order to avoid government land redistribution schemes.

As under private governance, the authority for managing the protected land and resources rests with the landowners, if there is no official recognition by the government of regulatory legislation, the accountability and transparency of PPAs to society cannot be assured (Borrini-Feyerabend et al., 2013). This could have impacts on the landowner's commitment to conservation objectives or to social justice. Government policy that favors individual (rather than group) tenure and agriculture (rather than pastoralism) can also impact PPAs, leading to land speculation, group ranch subdivision and sale (Carter et al., 2008). This has been the case in Kenyan group ranches that have experienced a variety of additional problems, such as population growth and dispute over appropriate land use, as well as poor governance, with disputes over boundaries and dispossession because of default on payments to finance institutions where the land has been used as collateral (Carter et al., 2008). Other successful private conservation initiatives, such as the Save Valley Conservancy in Zimbabwe, have been at the mercy of government policies (Kreuter et al., 2010). Following Zimbabwe's Fast Track Land Resettlement Program, about 25% of the southern half of the conservancy no longer operates effectively as a wildlife conservation area because of the influx of people who were forcibly resettled from land taken by Zimbabwe's political elites (ibid.).

2.3 Concluding remarks

When considering PPAs in light of principles of good governance, based on what becomes apparent from the literature, PPAs indeed meet many of the general criteria. PPAs are formed through arrangements in which power is devolved and shared, allowing for various stakeholders to have a voice, as well as having the tendency to do well in their overall performance. The longevity, accountability and transparency of PPAs may not always be apparent, however. Overall, as Jones et al. (2005) note: “There is little doubt that private protected areas can be as effective, and in some cases more effective, than state protected areas. In places with serious poaching pressure, well-funded private hunting reserves may be better able to maintain viable populations of large mammals than official protected areas with fewer resources.”

3. Governance by indigenous peoples and local communities

3.1 Contextual influences

PAs under the governance of indigenous peoples and local communities can also be very diverse in type, form and size as these areas can be under rulings that are customary or legal, formal or informal, and can range from Indigenous Peoples' and Community Conserved Territories and Areas (ICCAs), to sacred sites and ancestral domains, to native territories managed as wilderness areas. These different set-ups can be relatively complex as, under customary and local institutions, land, for example, may be collectively owned and managed, but particular resources may be managed individually or on a clan basis; different communities may also be in charge of the same area at different times of the year, or of different resources within the same area (Borrini-Feyerabend et al., 2013). Key, however, is that indigenous peoples or local communities have institutional arrangements under which they can make decisions and develop rules for the land, water and natural resources (ibid.).

ICCAs, which can be defined as "natural and modified ecosystems with significant biodiversity, ecological and related cultural values, voluntarily conserved by indigenous peoples and local communities through customary laws or other effective means" (Kothari, 2006), now give official recognition to the oldest form of PAs (Kotahri, 2008). Such recognition should help more easily identify and register areas under community governance internationally. A number of ICCAs have already been recorded across sub-Saharan Africa. However, there are likely to be many more such areas in Africa (see Section 2) as scholars estimate that about 11% of the world's total forest area is under community ownership or administration of which 370 million ha is reported to be under some level of conservation management by communities (Molnar et al., 2004). Furthermore, areas governed by communities are likely to be underrepresented officially as many are not yet recognized legally by governments as well as some local communities themselves not even being recognized as legal subjects by some governments (Borrini-Feyerabend et al., 2013). The important role of these PAs in biodiversity conservation is recognised notably through the establishment of the ICCA registry (Juffe-Bignoli et al., 2014).

The multiplication of the various forms of community governance of natural resources across sub-Saharan Africa began in the 1980s and 1990s, driven by the international push for popular natural resource management. The international conservation community was increasingly coming to understand that, when fully empowered, local communities can become reliable stewards of the environment while improving their livelihoods (Matose and Watts, 2010; Mohan and Stokke, 2000; Murphree, 2009; Kellert, 2000), as well as strengthening the sustainability of conservation efforts (Treue et al., 2014; Persha et al., 2011; Ostrom, 1990). Furthermore, the success of community-based natural resource management (CBNRM) has been shown to be closely linked to incorporating local institutions and cultures (Waylen et al., 2010; Ostrom, 2009), which further supports the empowerment of communities. There has also been clear recognition that while necessary, top-down, state governed PAs are not sufficient in protecting valuable biodiversity and ecosystem services (Adams and Hulme, 2001; Torquebiau and Taylor, 2009). Additionally, strict spatial separation of land use achieved through the fencing off of areas is expensive, often seen as coercive and not socially just, thus not representing the best solution (Torquebiau and Taylor, 2009). While the governance of natural resources by local communities is certainly not a new concept in Africa,

and the CBNRM movement could be considered a "modern attempt to revive often quite established and traditional local and indigenous cultural and institutional mechanisms for managing and conserving the natural environment" (Kellert, 2000), the international promotion of CBNRM has certainly allowed for community governance to become more widespread and gain much needed additional support, especially given the tendencies of many African states to centralize and retain power (see section above on state governance).

As truly effective community governance can only occur when communities possess sufficient power to make decisions and to develop rules for natural resources, the existence of legislation and policies that allow for this to occur is critical. Effective decentralization policies pertaining to natural resource governance are therefore key to communities being able to manage their own resources. However, despite decentralization policies being in place in most African countries, these policies most often are at best a form of deconcentration, not democratic decentralization (Murphree, 2009; Nelson and Agrawal, 2008; Ribot, 2002), in which power is devolved to locally elected authorities who are downwardly accountable to the population in their jurisdiction through various electoral processes (Agrawal and Ribot, 1999). The latter is noted as being crucial in creating an environment in which community-based initiatives can flourish and sustain (Agrawal and Ribot, 1999; Ribot, 2002; Conyers, 2000).

Few African states possess legislation allowing for the democratic decentralization of natural resources, however. As Ribot et al. (2010) have stated, in current discourses "almost everything is called decentralization. Without careful reading, it is difficult to distinguish participatory approaches […] from co- management […] or democratic decentralization" (ibid.). In many cases, efforts in which communities are meant to be in control of the conservation of natural resources take the form of PA outreach in which local participation is weak and passive, and the state remains the resource proprietor (Roe et al., 2009).

In West Africa, for example, this pattern is quite apparent. In Senegal, Niger, Burkina Faso and Mali, while rural councils are indeed openly elected and might even be relatively representative of the local populations, these councils are not autonomous decision-making bodies (Ribot, 2002). Instead, they merely assist and advise the government body that approves local requests (ibid.). The councils are thus upwardly accountable and hence the system does not constitute democratic decentralization although at first sight it might seem to be such. Furthermore, several countries have established land registration schemes and Côte d'Ivoire even passed a decree as early as 1967 granting land ownership to those who cultivated it – in practice, however, few land title requests have been processed (Roe et al., 2009). In much of francophone West Africa, the *Gestion des Terroirs* approach has become a popular tool since the 1990s as it devolves management and decision-making authorities to local officials (Roe et al., 2009). The land is still owned by the state, however, essentially making any community effort a co-managed approach (Roe et al., 2009) rather than allowing for true community governance to develop.

With the exception of Cameroon and the Central African Republic (CAR), most Central African countries have very little legislation supporting proper decentralization. In some cases, where decentralization policies have been established, they have not been implemented, thus making it difficult to even set up community-governed projects (Roe et al., 2009). Most conservation projects

involving communities are linked to simply receiving benefits from PAs (Roe et al., 2009) and thus could not be classified as community governance.

By contrast, Southern Africa has witnessed more innovative approaches to natural resource decentralization. In many parts of South Africa, private landowners have been given rights over land and wildlife, which has led to noticeable and rapid recovery of wildlife, thus validating devolved conservation approaches (Child and Barnes, 2010). Due to the fact that decentralization policies in Southern Africa often allow for private land ownership, community governance has taken place in conjunction with third-party leases or joint venture partnerships involving the private sector, such as tourist operators (Roe et al., 2009). Overall then, CBNRM in Southern Africa is less linked to the typical PA co-management or benefit-sharing scheme found elsewhere on the continent (Roe et al., 2009), thus leading to more widespread local control over natural resources, at least on private or communal lands. Nonetheless, while some countries, such as Namibia and Botswana, have been more successful in devolving control over natural resources to lower levels of society, many CBNRM reforms in other countries of the region with less accountable and transparent governance norms, such as Mozambique and Zambia, are still run through the central government and lack sufficient local involvement (Nelson and Agrawal, 2008).

In East Africa, the community empowerment narrative has been actively promoted, but the control over natural resources has largely remained with the central government (Roe et al., 2009; Nelson and Agrawal, 2008). In Kenya, private land ownership is possible, thus allowing communities to directly benefit more from wildlife than in other East African countries where the state retains greater control (Roe et al., 2009). In Tanzania, for example, there have been tensions over the rights to wildlife revenues as communities are aware their Kenyan neighbors are reaping greater benefits from tourism due to their stronger local land rights (ibid.). Nelson et al. (2007) note that communities in Tanzania might even be losing their incentive for conservation due to these circumstances, again highlighting the need for true devolution of power to create local empowerment.

Furthermore, in much of sub-Saharan Africa, control over the most valuable natural resources is rarely granted to local populations, which makes many decentralization policies even less effective. Central governments often retain rights over the most lucrative resources, be it land or wildlife, in order to control the main channels of revenue generation (Conyers, 2000; Matose and Watts, 2010; Nelson and Agrawal, 2008). As Ribot (2002) notes, “only the most trivial decisions and onerous obligations are devolved, while the central-level forest service maintains strict control over aspects of forestry that are either lucrative or help to justify the existence of forestry departments.” The overall political disposition and levels of democratic governance of a country therefore certainly play an important role in enabling community governance (Nelson and Agrawal, 2008).

Many of the fundamental contextual elements needed to create an environment in which proper community governed PAs can develop are therefore absent in many parts of sub-Saharan Africa – remnants of the colonial past still remain, through which tenure rights are generally not very conducive to community ownership or proprietorship of land and resources (Büscher and Dietz, 2005). Nonetheless, despite such shortfalls, many community-governed PAs do exist across Africa and are very likely to be more widespread than recorded thus far. Due to the limitations imposed by many fundamental contextual elements, however, many current cases of community governance

may technically fall under shared, or even state, governance as conditions make it difficult for communities to take full ownership.

3.2 Strengths and weaknesses

Strengths

Where conditions have made it possible for PAs governed by communities to become established successfully, many benefits can be created. Many ICCAs in Southern Africa, for example, have been successful in conserving biodiversity. According to Arntzen et al. (2003), for example, poaching is widespread in Botswana, but levels are falling within the community trust areas where communities or safari operators manage the hunting and that wildlife-based community conservation encourages the conservation of biodiversity and has the potential to maintain or preserve the open grassy savannas of the Kalahari system in Botswana. In Namibia, Communal Area Conservancies are required by law to have a constitution, which includes the sustainable use of wildlife as one of the conservancy objectives (Jones et al., 2005). Conservancies receive legal rights to enter into contracts with the private sector for trophy hunting and the development of tourist lodges, and they are also able to buy and sell wildlife and hunt game for meat (ibid.). The Torra Conservancy, for example, covers 352,000 ha of land in the arid north-west of Namibia and hosts a variety of endangered species, such as the black rhino, lion, leopard and cheetah (ibid.). In western Cameroon, the Batoufan area, which contains forests of high biodiversity value, is controlled by around 100 independent chiefdoms that possess and guard a series of sacred forests through various community-based and secret societies (Nelson and Gami, 2003). Access to these sacred forests is strictly controlled by community institutions, while still allowing community members to enter either to collect some medicines or to harvest a wide range of products within limitations (ibid.).

Effective ICCAs also allow for biodiversity conservation to take place at a relatively low cost and with little unnecessary bureaucracy (Kothari, 2006). Such areas can also provide protection against extractive industries, such as in Nigeria, where the Ekuri people are protecting 33,600 ha of dense tropical forest on their communal land, and have resisted the overtures of logging companies despite being offered a road, of which they are in need (Ogar, 2006).

PAs that are successfully governed by communities can also provide many socio-economic benefits. In Namibia, for example, while community conservancies do not have complete ownership of wildlife since quotas are still set by the central government, the devolution model is robust as conservancies are "administered by locally elected management committees, retain 100 per cent of the revenue earned from tourism joint ventures and tourist hunting concessions, and determine their own investment partners [as well as] are not term-limited" (Nelson and Agrawal, 2008). By 2007, 50 conservancies had been established, managing over 14% of total land area and having generated approximately US$ 5.7 million (Suich, 2010). Suich's (2010) study of the Caprivi area determined that human, natural and social assets had all improved. Other recent studies also demonstrate the success of community governed PAs in Namibia (Conniff, 2013; Agarwal and Freudenberger, 2013), including a case which has led to increasing economic benefits for 230,000 people resident to communal conservancies, and that this increase in revenue generated by sustainable natural resource management has coincided with the improved management and

recovery of populations of large wildlife throughout the affected communal areas (Naidoo et al., 2011).

While Ghana cannot claim the same amount of uniform success across the country, the government owns less land than in other West African countries and traditional leaders can have significant control of resources (Roe et al., 2009). In this context, the Wechiau Community Hippo Sanctuary (WCHS) was founded in 1998 by local chiefs who set up a management board consisting entirely of local representatives who act for the 17 participating communities (Sheppard et al., 2010). The project has been very successful overall and has not only performed well in biodiversity protection but has "alleviated poverty by increasing income through ecotourism employment and a shea nut cooperative, by improving access to water, schools, lighting and health care, and by developing social capacity to create self-sustaining revenue streams" (ibid.). The sanctuary's freedom from central control and presence of true community ownership has allowed the initiative to prosper.

Weaknesses

Although community governance of natural resources continues to be advocated and certainly has the potential to provide many benefits, it is not the panacea to all conservation problems. Kothari (2006) has taken note of various weaknesses of this governance type, such as communities suffering from internal inequities and social injustices, in particular when the most powerful community members make decisions regarding resources. Elite capture of power is indeed a common problem and can lead to the richest and most powerful members capturing a disproportionate amount of benefits, thus hindering the success of community-based initiatives (Dutta, 2009; Roe et al., 2009; Ribot, 2002). Furthermore, there can be clashes between neighboring communities, tensions between younger and older generations of a community over the best management strategies (Roe et al., 2009), as well as conflicts between customary and statutory institutions where traditional authorities are being undermined (Stamm, 2000). In the Kalahari Gemsbok National Park in South Africa, for example, after settling a land restitution claim giving community rights to a pocket of land, when deciding the objectives of the area, clashes occurred between 'traditionals', who wanted to revert to a forager lifestyle, and 'moderns', who wanted to engage with the tourist industry and other enterprises (Carruthers, 2007). In ICCAs, the risk also exists that traditional forms of authority and legitimization are undermined by new political or social forces, including immigrants, and previously sustainable levels of resource use may be causing over-exploitation, as natural resources may no longer be as abundant due to activities such as hunting (Kothari, 2006).

3.3 Concluding remarks

When communities are able to establish PAs under their governance, many benefits can be derived, which is likely linked to many criteria of good governance being met. Weaknesses do also exist under this form of governance, some of which are internal, such as problems stemming from within communities (conflicts with neighbors, power struggles, elite capture), and the majority being external contextual elements that make it difficult for community governed PAs to be created successfully to begin with. Without the sufficient legislative and policy support, it is difficult for

communities to establish areas in which they truly hold the power to control the use and benefits of natural resources. Many forms of community governance in Africa may therefore technically be forms of shared governance at best; but with the additional support needed, these could be transformed into well-functioning community PAs.

4. Shared governance

4.1 Contextual influences

When PAs are under shared governance, institutional mechanisms or processes can be in place either formally or informally that devise ways in which to share authority and responsibilities among several stakeholders, such as governments, NGOs and communities. As for a long time, no clear distinction was formally made between governance and management, many shared governance arrangements are still often referred to as collaborative, joint or co-management (Borrini-Feyerabend et al., 2013). In shared governance situations, formal decision-making authority might still be vested in one agency, such as a governmental body, but that agency is required by law to collaborate with other stakeholders (Macura et al., 2013). Such collaborative partnerships may be implemented through various forms, ranging from consultations to decision-making carried out by consensus (ibid.). However, in proper shared governance, the representatives of various interests or constituencies should be represented in a governance body with decision-making authority and assigned responsibilities while making decisions together (Borrini-Feyerabend et al., 2013). Shared governance situations may evolve in cases where government agencies in charge of a PA decide to include more stakeholders in order to improve the effectiveness of the PA or, conversely, when local communities may require administrative support from governments and technical support from NGOs, for example. As Borrini-Feyerabend et al. (2013) have noted, shared governance settings "are usually dynamic and evolving, demanding on-going innovation, negotiation and adaptability [and] the willingness of the partners to engage in the process is crucial."

While only a fairly moderate number of PAs under shared governance in sub-Saharan Africa have been officially reported (see Section 2), it is very likely that the actual number of shared governance situations is high. As is discussed in detail in the previous sections of this review, various contextual elements make it difficult for many PAs under other governance types to exist in their purest form according to their strict definition. For example, although state-run PAs are still the most abundant type of PA due to the fact that most formally designated PAs in Africa were initially established by governments, the international movement pushing for greater community involvement in conservation, as well as communities reclaiming their rights, has led to many government PAs involving communities and other stakeholders. Indeed, national park managers in most countries are trying to collaborate with local people in order to improve their effectiveness, with approaches ranging from park outreach to co-management (Barrow and Murphree, 2001). Alternately, PAs governed by communities are often not able to operate fully independently from the government, therefore putting them under some form of shared governance rather than full community governance. Even privately governed PAs can turn into forms of collaboration when several landowners group together to form a more expansive reserve area under a common management plan. It is therefore likely that many African PAs that would at first sight be considered to fall under one of the other governance types are in actuality under some form of shared governance.

Even shared governance situations must meet certain criteria, however, as otherwise these can result in PAs being shared only on paper rather than in practice, and the distribution of powers and levels of participation therefore need to be considered carefully. The involvement of communities in a shared governance situation, for example, should involve meaningful participation of communities going beyond superficial consultations (Pimbert and Pretty, 1995).

When implemented successfully according to the criteria of shared governance, transboundary PAs represent a particularly important example of shared governance. These not only usually involve more than one government, but also communities, NGOs and private parties. Although even such multi-stakeholder initiatives can be dominated by the state, as is the case in the Great Limpopo Transfrontier Park (Metcalfe, 2003), they have the potential to create very innovative conservation collaborations. In the case of the ZIMOZA transboundary initiative between Zimbabwe, Mozambique and Zambia, for example, communities living in the transboundary area have been helped by NGOs and their local authorities to develop a framework agreement aiming to improve the management of transboundary natural resources on community lands in Mozambique, Zambia and Zimbabwe (ibid.). The African Wildlife Foundation (AWF) has also targeted a larger transboundary landscape that incorporates the ZIMOZA initiative, linking both protected and community areas, and technical officials from the wildlife departments and community leaders have met and shared perspectives and jointly identified the main conservation targets and threats (ibid.). Cooperation between technical personnel from the transboundary countries continues to grow through a jointly conceived and endorsed landscape conservation strategy and the relationship between the conservation staff and the communities is improving (ibid.). Furthermore, while high-level civil servants and political leaders have not been very involved at this stage, they are aware of the process and sanction it at its current stage (ibid.). As Metcalfe (2003) therefore notes, the ZIMOZA agreement is indeed "unique as it is community based, bottom-up and facilitated by NGOs rather than governments".

Further to the paradigm shift in environmental governance (Büscher and Whande, 2007; Wilshusen et al., 2002; Brechin et al., 2002), as well as the explosion of the amount of actors involved therein (Büscher and Dietz, 2005) having contributed to the development of PAs under such forms of shared governance, additional contextual elements need to be in place. Aspects of power, for example, need to be considered carefully in order for multiple actors to have meaningful participation in shared governance. Arts (2003) has developed a model of three independent faces of power, for example, which can be used to analyze the division and sharing of power in shared governance situations: (i) decisional power, which is related to policy making and political influence; (ii) discursive power, which is related to the framing of discourses; and (iii) regulatory power, which is related to rule-making and institution building. Traditionally, decisional and regulatory powers in a society would typically be attributed to the state, although the state can also have great discursive powers (Büscher and Dietz, 2005). If PAs are to be governed in a truly shared way, however, multiple stakeholders, including non-state actors, need to have meaningful levels of some of the three aspects of power.

Whether or not such powers are shared in order to build fruitful collaborations can certainly be influenced by the central government's political willingness to do so, as well as the wider political situation of a country. In the case of the Great Limpopo Transfrontier Park, for example, it has been argued that it was difficult to have a genuine partnership even between the three states involved (South Africa, Zimbabwe and Mozambique) due to existing political and economic inequalities (Duffy, 2006). Of the countries involved, South Africa is the largest and most stable regional power, while, at the time of the study, the other two states had limited capacity for policy implementation as Mozambique was recovering from a protracted civil war, while Zimbabwe was in the grips of a political crisis (ibid.). Amidst this situation, the South African Minister Moosa largely dominated the process (Büscher and Dietz, 2005), which further created uneven power relationships between the

states. With such power struggles even at the highest political level, it is unlikely for authority and responsibilities to be shared with other stakeholders.

Many factors that have been instrumental in allowing for community governed PAs to gain support and become more widespread are certainly also of importance to the development of PAs under shared governance. Notably, the decentralization of natural resources and supportive land tenure policies are also crucial for power and responsibilities to be shared amongst multiple stakeholders. These issues are discussed in detail in the previous sections of this review.

4.2 Strengths and weaknesses

Strengths

As with the other governance types, PAs under shared governance can have multiple biodiversity and socio-economic benefits (see other sections for additional points). Especially in transboundary settings, collaboration between stakeholders can lead to large areas of continuous habitat being protected across borders. In the greater Virunga landscape, which includes Virunga National Park in the Democratic Republic of Congo (DRC) and ten contiguous PAs in Uganda and Rwanda, partnerships between governments and the Wildlife Conservation Society (WCS) have improved regular communication between the parties involved and better joint management planning (Plumptre et al., 2007). The improved landscape connectivity has led to reducing the impact of the civil war on elephants and the number of mountain gorillas has increased over the last 25 years (ibid.). Transboundary areas can also re-establish seasonal migration routes (Munthali, 2007) and through the formation of partnerships bringing together various types of habitats and land uses, landscape mosaics of biodiversity importance can be created (Gardner et al., 2007).

When implemented successfully, transboundary PAs can also provide many socio-economic benefits. They can allow, for example, for functional community natural resource governance institutions to be established and empowered to represent their constituencies in securing fair equity from profits made from sustainable use of the conserved biodiversity assets and tourism businesses (Munthali, 2007). Furthermore, such PAs can provide means of increasing economic opportunities, decreasing cultural isolation, as well as fostering cooperation in a bilateral and regional framework (Singh, 1998). Under shared governance, in particular in transboundary PAs, many opportunities exist to "create the formation of alliances between different stakeholders (governments, the private sector, local communities, and non-governmental organizations) as a means of developing consensus and enabling the available finite skills and resources to be maximized in promoting sustainable land use, biodiversity conservation and alleviating poverty in rural areas" (Munthali, 2007). It can therefore be considered a highly attractive form of PA governance both in terms of achieving biodiversity and development goals as it has the potential to involve many stakeholders in an equitable way, sharing responsibilities of governing large landscapes.

Weaknesses

While involving many stakeholders can have multiple benefits, partnerships in co-management

arrangements can also be problematic as the nature of power sharing can make less powerful partners, such as indigenous people, disadvantaged (Nadasdy, 2003). Additionally, as mentioned in previous sections, arrangements that have the potential to promote successful and innovative conservation approaches, such as transboundary PAs, can be misused and all decision-making powers can be high jacked by one stakeholder. Transboundary arrangements may also not always be appropriate in every situation. Petursson et al. (2003) note that the proposed transboundary PA for Mt Elgon in Uganda and Kenya may have seemed like an advantageous arrangement at first glance, being able to protect the whole mountain under a single PA. However, the authors found that the landscapes of the two sides of the mountain are different, as are the social relations and governance strategies in the respective PAs, and that the interplay of different social relations clearly indicates that a transboundary regime would not provide a better fit to the current PA governance challenges (ibid.). Just as with the other governance types, shared governance has various weaknesses and needs to be implemented carefully.

4.3 Concluding remarks

PAs under shared governance have the potential to be the most multi-faceted form of governance, involving a wide variety of stakeholders, habitats, land use and management types. They can even extend across borders, thereby protecting large stretches of biodiverse habitat. Currently, these PAs are also likely to be most incorrectly reported, but along with the paradigm shift in environmental governance, the future of PA governance in Africa is likely to be shaped by an increasing number of shared governance scenarios, which, if carried out successfully, would have the potential to contribute greatly to the protection of biodiversity as well as the reduction of poverty.

Conclusion

The way in which PAs are viewed, managed and governed has changed quite dramatically over the past few decades. In more recent times, PA governance has become a topic of international interest and many efforts have been made to better understand the importance of governance, to better define as well as evaluate it. PAs across sub-Saharan Africa provide many interesting examples of these developments. All four types of governance can be found across the region, in each instance providing new insights into different contexts, involving diverse stakeholders and dealing with a variety of challenges as well as successful outcomes. While the development of each governance type is often highly context-specific, this review has nonetheless allowed to identify some broad contextual influences that have allowed for the various types of governance to develop in sub-Saharan Africa. When considering PAs at a more local scale, many additional elements are likely to become apparent. These factors emerge from the literature analyzed in this broad review of the topic, however, and should also provide useful insights on what needs to be addressed in PA governance in order to work towards improving the effectiveness of PAs under different governance types.

4. Additional Contextual Elements and Synthesis

In addition to the literature review presented above and highlighting the main contextual elements influencing PA governance, we carried out additional spatial analyses, when potentially relevant datasets were available, and summarised the findings of our study - based both on the literature review and on spatial analyses - in a table.

Spatial and Statistical Analyses

Bio-geographical settings

In Section 2, we investigated whether there was a correlation between the biome and the type of governance and found that there was a higher coverage provided by shared and private PAs to Tropical and Subtropical Moist Broadleaf (and lower coverage by state and community PAs); a higher coverage by shared governance to Tropical and Subtropical Grasslands, Savannas and Shrublands (and lower coverage by private and community PAs); and a higher coverage by state, private and community governance to Deserts and Xeric Shrublands (and lower coverage by shared PAs).

Demographic trends

Here we investigated whether there was a correlation between population density and the presence of PAs under different governance types (Figure 14 and 15). For the population density, we used the AfriPop dataset (Version 3.0 2010) which estimates the total number of people per grid square across Africa, available from http://www.worldpop.org.uk. We used the total population version, adjusted to match UN figures (as described in http://www.worldpop.org.uk/data/methods/). However, the dataset is at a lower resolution than the WDPA, and led to the exclusion of 455 PAs which were too small to be included in the analysis.

Governance type	Mean number of inhabitants per km^2	Estimated mean	Standard Error	t-value	P-value
State	288.0	274.7	85.663	3.207	0.00135**
Community	13.2	13.2	78.677	0.168	0.86649
Shared	40.4	27.2	220.276	0.124	0.90166
Private	16.5	3.3	122.223	0.027	0.97834
Not Reported	123.4	110.1	80.637	1.366	0.17202

Table 9. Mean population density in around PAs with different governance types, and results of statistical tests.

For the PAs included in the analysis, we found that PAs under state governance had a significantly higher population density than PAs under different governance types (Table 9), and Tukey multiple comparisons revealed that the difference was mostly between state PAs versus not reported, followed by state versus community PAs, and to a lesser extent state versus private PAs.

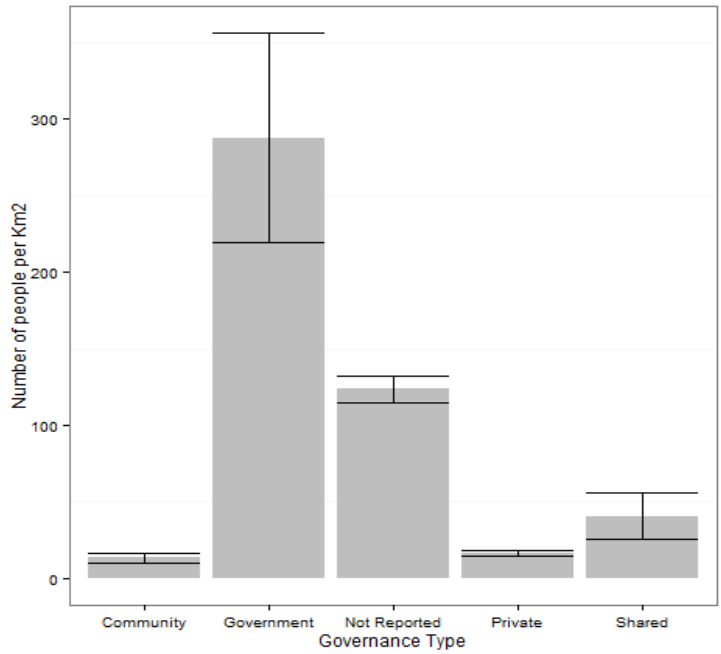


Figure 14. Mean population density according to different PA governance types.

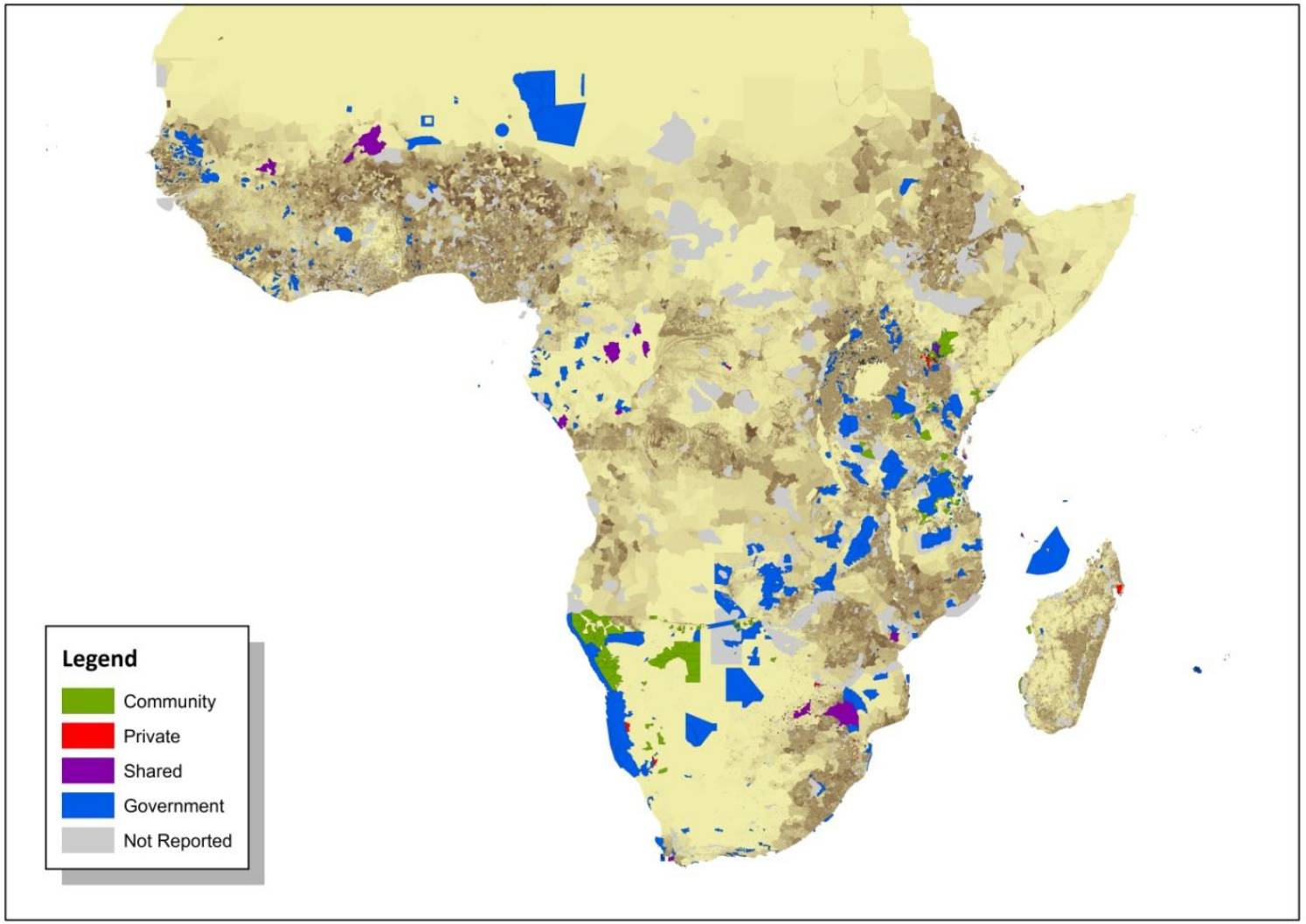


Figure 15. Population density and protected areas under different governance types.

Agriculture suitability

We used the Suitability for Agriculture dataset from The Atlas of the Biosphere, a product of the Center for Sustainability and the Global Environment (SAGE) available from: http://www.sage.wisc.edu/atlas/maps.php?datasetid=19&includerelatedlinks=1&dataset=19.

Our analyses suggested that PAs under state management were much more suitable for agriculture; however, the grid cells of the dataset were too coarse for a detailed analysis, meaning that 5,534 PAs had to be excluded, so these preliminary results would need to be verified with the use of a more fine-scale dataset.

Socio-political context

We investigated the possible correlation that could exist between the presence of some PA governance types and the socio-economic and political contexts by looking at the Gross domestic product (GDP) and Index of African Governance per country.

- GDP per capita (World Bank 2009-2013)

We used the dataset from the World Bank for the period 2009-2013 available at: http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD?order=wbapi_data_value_2013+wbapi_data_value+wbapi_data_value-last&sort=desc. We found no correlation between the proportion of protected areas which are under a non-state governance (i.e. private, community or shared) and the GDP, including only reported governance types (Figure 16).

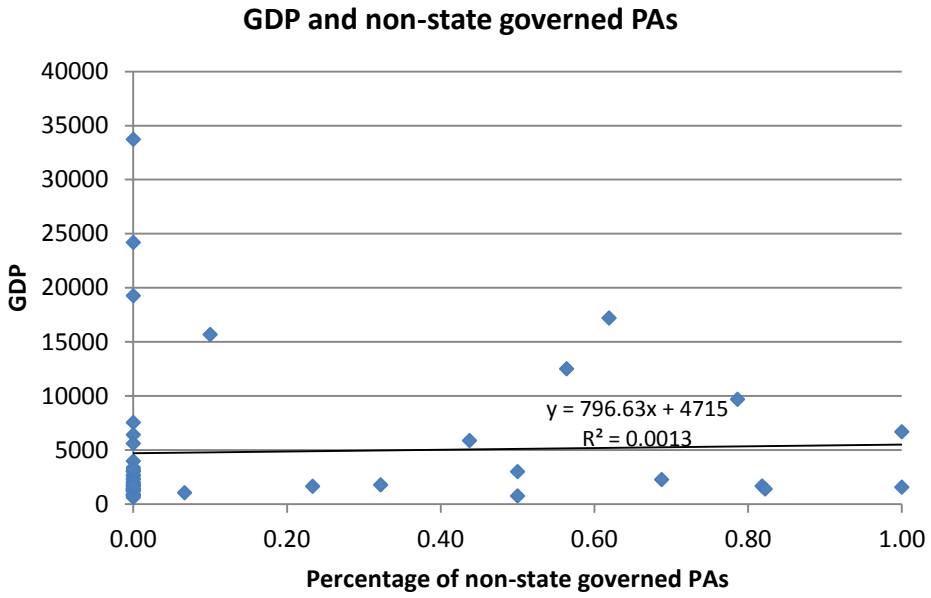


Figure 16. GDP and percentage of PAs under a private, community or shared governance (of the total reported governance types).

- Ibrahim Index of African Governance

http://www.moibrahimfoundation.org/iiag/

The Foundation defines governance as the provision of the political, social and economic goods that a citizen has the right to expect from his or her state, and that a state has the responsibility to deliver to its citizens. The Index was compiled by combining over 100 variables from more than 30 independent African and global sources and is the most comprehensive collection of data on African governance. We found no correlation between the proportion of protected areas which are under a non-state governance (i.e. private, community or shared) and the African governance index, including only reported governance types (Figure 17).

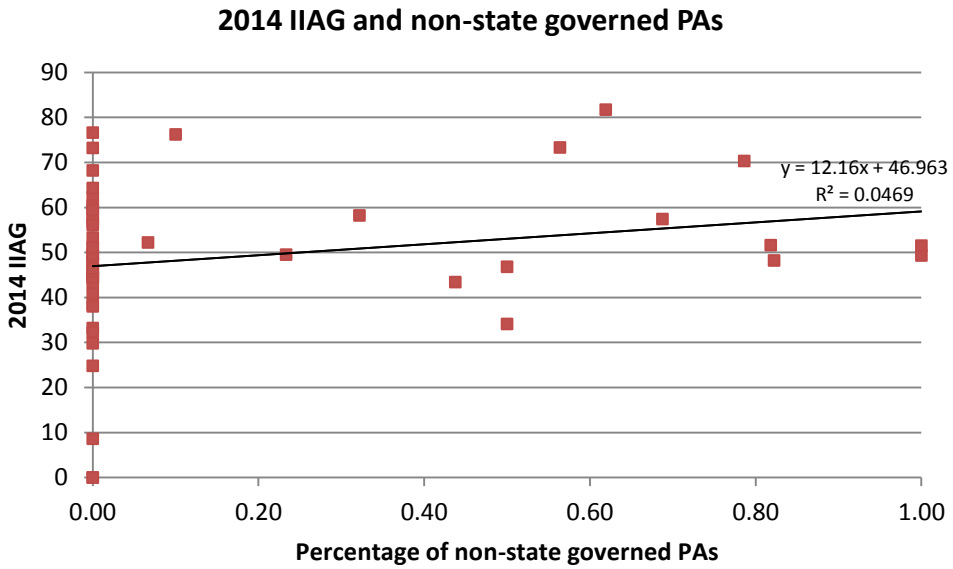


Figure 17. 2014 Index of African governance and percentage of PAs under a private, community or shared governance (of the total reported governance types).

Selection of case studies

Spatial analyses and findings from the literature review were used to highlight countries where more data exists on governance types and/or where a greater diversity of governance type is found, and hence where more detailed analyses of state, private and shared governance regimes are likely to be the most interesting.

Based on preliminary discussions with project partners and potential countries, and on the results of this study, the following countries were chosen as case studies for Study 1, 'Shared (State-Community) Governance', Study 2, 'Private Governance', and Study 3 'State Governance':

- Namibia (99% reported, including 76% community PAs);
- Tanzania (28% reported, including 68% state and 30% community PAs);
- Madagascar (31% reported, including 75% community PAs);
- The Gambia (92% reported, including 58% shared PAs); and
- Republic of the Congo (55% reported, including 31% state and 24% shared PAs).

Contextual elements summary

Based on the findings of the literature review and on the results of the spatial analyses, Table 18 summarizes the factors and contextual elements that are more likely to influence the establishment (or maintenance in the case of state PAs) of a certain type of PA governance.

Study	Factors / Contextual elements	State	Private	Community	Shared
Literature review	Colonial history and post-colonial formation of states	✓✓✓	✓	✓	✓
	Shift in international paradigm of environmental governance		✓✓	✓✓✓	✓✓
	Emergence of new actors in environmental conservation		✓✓	✓✓	✓✓
	Political will, levels of democratic principles and sharing of power		✓✓	✓✓	✓✓✓
	Decentralization policies		✓	✓✓✓	✓✓
	Land tenure rights		✓✓✓	✓✓✓	✓
	Wildlife based markets		✓✓✓	✓✓	✓
Spatial analyses	Large geographic area	✓✓✓		✓✓	✓✓
	Old establishment date	✓✓✓			
	Number of mammal, bird and amphibian species	✓✓✓	✓	✓	✓
	Threatened mammals, birds and amphibians	✓	✓	✓✓✓ TBC	✓
	Biome (coverage): Flooded grasslands and savannas; Mediterranean forests, woodlands and scrub; Deserts and Xeric Shrublands	✓✓✓ TBC	✓✓	✓✓	✓✓
	High population density	✓✓✓ TBC	✓	✓	✓
	Gross Domestic Product (GDP)	✓	✓	✓	✓
	Index of African Governance	✓	✓	✓	✓

TBC: The results indicated with TBC (To Be Confirmed) are only preliminary and would need to be verified with more complete data on PA governance types.

Table 18. Summary of the factors and contextual elements that are likely to influence governance type of a PA.

5. Annex

References used in the literature review

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Description of the databases used for the spatial analyses

WDPA:

The World Database on Protected Areas (WDPA) is a joint project of IUCN and UNEP, managed by UNEP-WCMC, and is the most comprehensive global database on terrestrial and marine protected areas. It has its origins in the United Nations global list of national parks, first published in 1961, and has evolved into the only global, authoritative spatially referenced information source on protected areas.

PAME:

Many countries now routinely evaluate management of reserves using one of the many Protected Area Management Effectiveness (PAME) tools. The database contains records of the sites, timing and methods used to assess PAME. In most cases, the database also holds the results of the assessment, transformed into a common set of indicators of effectiveness that are independent of the method used.

ICCA Registry:

Indigenous and Community Conserved Areas (ICCAs) are defined as 'natural and/or modified ecosystems containing significant biodiversity values and ecological services, voluntarily conserved by (sedentary and mobile) indigenous and local communities, through customary laws or other effective means'. The ICCA Registry is an online resource documenting information about ICCAs in order to enhance understanding of their conservation and cultural values.

Number of PAs under different governance types per country in sub-Saharan Africa

Country	Not reported	State	Private	Community	Shared	Total
Angola	14					**14**
Burundi	17	2				**19**
Benin	58					**58**
Burkina Faso	90					**90**
Botswana	2	18	1	1		**22**
Central African Republic	38					**38**
Cote d'Ivoire	235	18				**253**
Cameroun	100	7				**107**
Democratic Republic of the Congo	47	1			1	**49**
Congo	13	9			7	**29**
Comoros	2				6	**8**
Cape verde	4	3				**7**
Djibouti	1	3			3	**7**
Erithrea	4					**4**
Ethiopia	104					**104**
Gabon	19	14				**33**
Ghana	318	3				**321**
Guinea	125					**125**
Gambia	1	2	1	1	7	**12**
Guinea-Bissau	33					**33**
Equatorial Guinea	12	4				**16**
Kenya	287	40	28	55	5	**415**
Liberia	5	16				**21**
Lesotho	4					**4**
Madagascar	101	8	2	34	1	**146**
Mali		23			7	**30**
Mozambique	20	28		1	1	**50**
Mauritania	8	1				**9**
Mauritius[5]	1	16	26			**43**
Malawi	132					**132**
Mayotte	1	20				**21**
Namibia	2	31	2	112		**147**
Niger	4	20				**24**
Nigeria	999	1				**1000**
Réunion		29				**29**
Rwanda	7	3				**10**

[5] Through the data compilation, we noticed that Mauritius is likely to have wrongly reported the governance of 25 of its PAs as 'For-profit organization' when they appear to be Nature Reserves, National Parks UNESCO MAB and Ramsar sites, which are more likely to be under a different governance.

Sudan	13	9				**22**
Senegal	15	108				**123**
Sierra Leone	46	4				**50**
Somalia	25					**25**
South Sudan	22					**22**
Sao Tome and Principe	4					**4**
Swaziland	6		14			**20**
Seychelles	6	19				**25**
Chad	21					**21**
Togo	32	60				**92**
Tanzania	452	118		52	4	**626**
Uganda	13	699				**712**
South Africa	849	82	103		3	**1037**
Zambia	587	48				**635**
Zimbabwe	225					**225**
TOTAL	**5124**	**1467**	**177**	**256**	**45**	**7069**