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An analysis of anti poaching techniques in Africa: A case of rhino poaching.

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Abstract

In the last decade the African continent has been facing a number of incidences on Rhino Poaching and we may be heading to Rhino extinction. A number of strategies have been tried and tested to protect the rhinos in Africa. Based on previous strategies to protect rhinos very little has been achieved in combating rhino poaching. Using extensive literature review this study investigates whether the current conservation methods are still useful in addressing poaching. Literature reveals that most methods have failed to protect rhinos. Therefore, forensic tests, shoot to kill policy and new strategies maybe the only way to avoid rhino extinction.

Keywords: Rhinos, Poaching, Strategies, Conservation.

INTRODUCTION

Human continuous destruction of the environment, diseases and food security are the real threats to the existence of the mammals in Africa. The black rhinoceros (*Diceros Bicornis*) and the white rhinoceros (*Ceratotherium simum*) have been the victims of human calculated environment destruction. The numbers of African rhinos have decreased during the past 20 years at an alarming rate due to poaching. A rhino horn is fetching about US\$60000-80000 on the black market according to the Convention on International Trade in Endangered Species (CITES) statistics for 2012. The most notable decrease is the Black rhinoceros that have been classified as endangered species because of its dwindling population. The Convention on International Trade in Endangered Species CITES (1977) classified trade in rhino horn as illegal. This ban has achieved limited impact in curbing poaching around the African continent due to the lucrative black market in the Far East Asia. The rhino horn is high in keratin which is used as a medicine in the Far EastAsia and as a trophy in Yemen (t Sas-Rolfes, 2012).

Black rhinos are projected to be numbered at about 4840 while the white rhinos are pegged at 20150 (www.iucnredlist.org). The intensity of poaching is a serious setback to all the efforts that have been directed by conservationists in trying to replenish the rhino population in Africa. Of particular concern is the intensity of rhino poaching in Southern Africa that threatens to undo all the efforts that have been made to avoid the extinction of rhinos. South Africa and Zimbabwe are countries that are most likely to destroy conservations efforts because of rampant poaching considering that South Africa alone has more than 93% of the white rhino population in Africa (www.gov.za). The rhino population expansion is attributed to the success of conservation methods that have been implemented since 1970s when poaching was at its maximum (Emslie and Brooks,1999).

Conservationists benefit in the upkeep of rhinos through tourism, hunting and live sales (Child, 2012). However, the costs of keeping rhinos have increased due to poaching and this has made rhinos a liability. Some of the conservationists are believed to be in dilemma if whether they should keep rhinos or sell them to the rhino market because the costs of maintaining them are high (Child, 2012). This crisis is intensified by poachers who are armed and dangerous, and who would kill to escape from authority.

Therefore, Africa is now at the same place as America was during the period 1900 to 1933 when the Bison mammal was hunted to extinction. Wildlife was nationalized in the line of this threat as it was believed that it was over utilized (Guthrie, 1990). Conservation of rhinos poses a greater challenge considering that the needs of wildlife are so much incompatible with human activities, Sukumar (1991) asserts that large mammals are a potential threat to agriculture and human life and their survival outside conservation is often low. Further, Leader-Williams *et al.* (1990) deduces that survival of species whose body parts are of commercial value is problematic. These factors highlight the complex nature of rhinos survival in any environment.

Although extensive academic research has explored the causes of poaching, ways of conservation and biodiversity preservation (Barnes & Jones, 2009; Barnard, 1998; Leader-Williams, 1990, Milliken *et al.*, 1993, Western, 1987) limited research has investigated the effectiveness of conservation methods (Child, 2012; Kahler, 2010; Nelson, 2006).

The increase in poaching conveys a need for research that goes beyond just identifying conservation methods, but weigh in different methods and their effectiveness. This need is illustrated by few studies assessing why poaching is on the increase yet the methods are believed to be working (Child, 2012). This highlights a major gap in environmental research which needs to be filled with new ideas in trying to curb poaching.

The purpose of this study is to answer the questions: “If the Rhino horn trade was banned in 1977 then why are rhinos still threatened in the 21 century?”. “Does this mean it is high time new approaches to poaching are devised?”

This paper analyses the current conservation methods that are relevant to the protection of rhinos or are fuelling poaching in the African context using empirical literature from different scholars. A review of literature to address where poaching started in Africa is discussed. This is followed by an analysis of conservation methods that have been used in trying to curb poaching in Africa. Lastly, a conclusion is given on what is best for African conservation at this point in time.

ILLEGAL POACHING

1.1 Where it all started

The Black rhinoceros population decreased from 6500 in 1970s to less than 1500 in 1980s (Emslie & Brooks, 1999). Parker and Martin (1979) equated the decline of the species to extinction which was mainly driven by poaching for horns. According to Western and Grimsdell (1979) an attempt by the Kenyan government to turn the Maasai settlement lands into an area exclusive to wildlife and tourism was viewed as a direct confrontation by the communal people of the Maasai and they speared rhinos. The Maasai only speared rhinos in reaction to the government land reforms in Kenya (Western,1973). However, that changed in the early 1970s as the land was converted for commercial gain (Western & Grimsell, 1979). This commercialization of land made rhino horns profitable thereby attracting poachers outside Kenya (Martin, 1980).

In Kenya rhinos continued decreasing in 1970s even though they were anti poaching methods in place. Most rhinos were killed outside tourist viewing areas and in most cases they were speared (Western, 1982). In 1977 decline of rhinos ended and the reversal was attributed to that Maasai people were officially excluded from national park and could not bring in their livestock (Western, 1982). On the other hand, Western and Henry (1979), asserts that in 1977 the Maasai people were given financial returns from the national park and therefore were sympathetic to wildlife. Moreover, the authors point out that financial returns were the major incentive that led to a decline in poaching than excluding them from the national park.

Due to poaching in 1977 CITES classified the black rhino under appendix I¹ which marked the ban on trade of horn species and products. TSas-Rolfe (2000) insists that the ban from CITES was not successful in reducing demand for the rhino horn even though some countries in Africa recorded noticeable growth in the species. In early 1990s rhinos that survived were primarily in heavy fortified reserves, Leader-Williams (1990) projected that the cost of upkeep of the rhinos was US\$200 kilometre square per year with the majority of 77% rhinos of the continental population in South Africa, Zimbabwe and Namibia. At the CITES conference in 1994 it was estimated that South Africa and Namibia contain about 70 % of the 3600 black rhinos remaining in Africa, therefore making these nations the vanguard in the recovery of these Rhinos.

1.2 Rhinos decline

A study by Leader-Williams *et al.* (1990), noted that the decline of rhinos were mainly caused by problems originating outside the protected areas, such as the increasing price of the horn in the international markets and a decline in economic opportunities for local people living in

¹ Appendix I lists species that are the most endangered among CITES-listed animals and plants and are threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is not commercial.

those protected areas. The study holds that law enforcement is very effective in protecting rhinos in small areas and population. However, in situations where the rhino population is large it is less effective.

Using a modelling poaching technique in the Luangwa Valley (Zambia) with respect to financial gains, detection and penalties, Milner-Gulland and Leader-Williams (1992) report that a penalty that varies with output is more effective than a fixed one. It is further noted that the detection rate was a deterrent to poachers compared to the penalty. The study alleges that differing incentive structures attract local poachers and dealers to poaching. Any policy that involves curbing poaching might not stop a syndicate employed by the dealer. Although modelling does not address a number of issues like intensity of poaching measures in curbing poaching it gives an idea of how complex is the poaching market.

Bulte and Va Kooten (1999) analysed the effects of the ivory trade ban on poaching and elephant stocks. Bulte and Va Kootens' (1999) study gives an idea of how the rhino market may respond to certain measures trying to curb poaching. The authors argue that banning trade may increase or decrease elephant stocks depending on the discount rate and probability of testing. The study unanimously highlights that ivory ban is more effective in conserving African elephants than allowing open trade. This study gives a picture that can be expected in the rhino markets if rhino horns are permitted to be traded in an open market. However, the fact that the study is done on a macro level using data of Zambian elephants, it cannot conclusively give the whole picture in the African context because markets differ within each nation.

A report by the Species Survival Commission (SSC) in 2009 presented statistics (see **Table 1**) on rhino poaching in Africa. It is projected that between the years 2006 to 2009 a minimum of 470 rhinos were poached in seven nations, 69 % were shot with the remainder being killed by spears and other methods. These ranged from using veterinary immobilizing drugs, poison and

cross bow. Further the report states that since 2006 poaching has shifted from Eastern Africa to Southern Africa. According to the SSC report 96 % of detected rhinos deaths in Africa occurred in Zimbabwe and South Africa.

Table 1 Rhinos killed illegal in period 2006-2009

Country	All Rhinoceros 2006-2009				Total
	Illegal Killing				
	Shot	Snared	Speared, Stabbed, Poisoned	Unknown but presumed poached	
Botswana	0	0	0	0	0
DR Congo	0	0	0	1	1
Kenya	16	1	0	0	17
Malawi	0	0	0	0	0
Mozambique	5	0	0	0	5
Namibia	0	0	0	0	0
South Africa	152	2	1	55	210
Swaziland	0	0	0	0	0
Tanzania	0	0	0	1	1
Uganda	0	0	0	0	0
Zambia	1	0	0	0	1
Zimbabwe	149	6	4	76	235
Grand Total	323	9	5	133	470

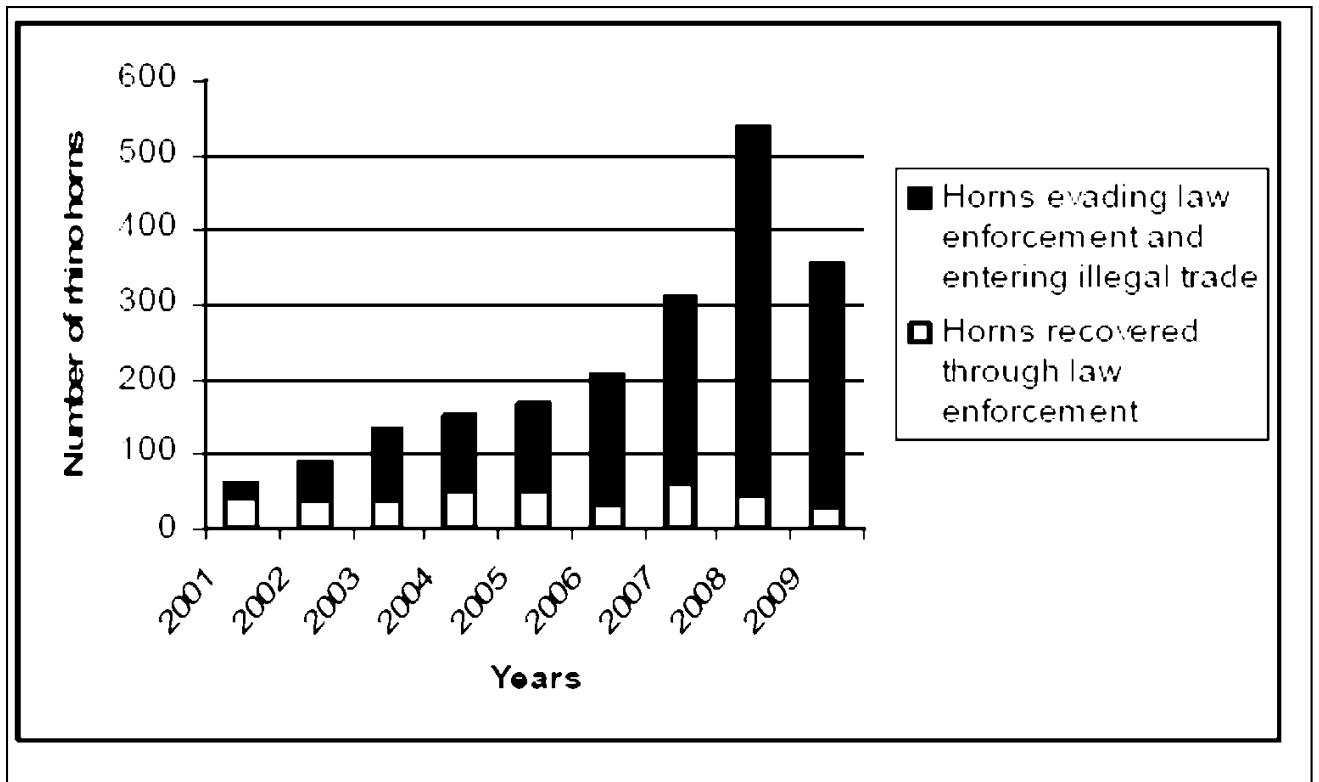
Source :CITES (2009)

1.3 Complicated poaching

One of the complex natures of poaching is the development of serious tactics by poachers. According to Rademeyer (2012) poaching syndicates are multinational and are known to be involved in high risk criminal activities such as diamond smuggling, drugs, vehicle theft and armed robberies. This structure of organized crime involves some government officials and business leaders who according to TRAFFIC (2012) are connected to poaching activities. Miliken and Shaw (2012) claim that conservation staff are also involved in the poaching business. A Vietnam embassy personnel was arrested with rhino horns and diamonds, under interrogation this personnel admitted that he used a diplomatic bag to move the rhino horns to Vietnam (TRAFFIC, 2012). The use of diplomatic immunity avoided prosecution (Rademeyer, 2012).

Table 2 shows rhino horns that evaded law and enforcements in period 2001-2009 to illegal markets. The increasing numbers of horns that evaded law highlighted the ineffectiveness of current enforcement reforms. According to the table there was a steady increase in horns evading law enforcements from as little as 20 horns in 2001 to 500 horns in 2008. CITES (2013) warns that rhino poaching is no longer an environmental crime, but constitutes of highly organized crime that threaten national security.

Table 2 Estimated Rhinos horn recovered or lost to illegal trade in Africa 2006-2009



Source CITES 2009.

CONSERVATION METHODS

Although many governments in Africa have tried different strategies to reduce poaching it seems the battle is long lost to a certain extent. A number of methods that involve huge investments have been tried and tested with minimum success.

1.4 De horning

In early 1990s in Zimbabwe, white rhinos were dehorned in Hwange national park. De -horning and translocation of rhinos from vulnerable areas reduced poaching of black rhinos (Duffy, 2000). However, a lax in security led poachers killing all the horned and dehorned rhinos. This perhaps shows that dehorning without adequate security produces the same result (Lindsay and Taylor, 2011). In Namibia it was practiced from 1989 to 1995 then it was stopped. The de-horning of rhinos, improvements in security and anti poaching measures contributed to the reduction in poaching and no rhino was poached (Lindsay & Taylor, 2011). du Toit (2011)

alleges that dehorned rhinos have a 29,1 % more chance of surviving poaching than horned rhinos. Kock and Atkinson (1993), challenge this view and insits that dehorning of rhinos is a costly exercise that is dependent on a number of factors such rhino population density, area size, vegetation and terrain and other relevant factors.

In Zimbabwe the costs of dehorning ranged from US\$ 500 were rhinos occurred at high densities and small areas to US\$5000 per animal where rhinos are widely spaced and dispersed in large areas (Atkinson, 1993). In Namibia it was estimated to have costed about US\$1400/Rhino to US\$1500 to dehorn (Morkel & Geldenhuys,1993). However, de horning continues to play a pivotal role in the protection of rhinos.

1.5 Community based conservation

A community based wildlife management (CWM) usual includes indigenous people as participants in wildlife activities (Songorwa, 2000). This method involves including communities affected poaching by making them a part of the solution to poaching. However, governments are reluctant to fully adopt CWM for the fear that it may jeopardize the tourism industry (Songorwa, 2005). Goldstein (2005) maintains that there have been constant struggles to maintain a healthy relationship with neighbourhoods living close to protected areas. These struggles are escalated by the spread of diseases by human intrusion and livestock to wildlife. Daszak *et al.* (2000) states that *filarioid* a worm that causes serious wounds to wildlife animals by exposing them to secondary diseases is usually transmitted through human and livestock movements. Diseases lead to wildlife losses and increase costs for conservation, as more medication is needed for the animals. This was noted in Kenya in 2011 when 4 black and 5 white rhinos were treated of filariosis lesions at the Meru National Park by the Kenya Wildlife Services.

1.6 Uniqueness of policies

The wildlife management policies of South Africa and Namibia were effective in protecting the rhino populations because of promoting locally managed commercial use of wildlife and adopting wildlife as a form of private land use (Child, 2004). Jones (2001) notes that Namibia granted private landholders the right to manage and utilize wildlife in their land subject to restrictions as a measure of protecting wildlife. However, in Zimbabwe a change of wildlife policy in 1993 led to budget cuts for national parks and in that period poachers ran riot and as little as 6 white rhinos were known to have survived in 1993 (Berger, 1997).

1.7 Shoot to kill policy

Cumming *et al.*(1990) states that conservation efforts in African rhinos have focused on military style anti poaching protection. It is noted that such methods are very costly in areas with low densities of rhinos (Martin, 1993). In 1980s the Zimbabwe government authorized the shoot to kill policy as a strategy of reducing poaching and it was met with criticism (Duffy, 2000). In that period between 1984 to 1993 park rangers killed more than 170 poachers, then a Protection of Wildlife Act was passed in 1989. This act was meant to protect game wardens that feared being charged with murder, this Act meant they could be absolved of any course of action done in good faith (Duffy, 2000). The Act boosted moral around anti poaching units and led to more poachers being killed than rhinos in 1990 (Duffy, 2000). The Act was said to be violating human rights as suspected poachers were not given a right to appeal and denied basic process. Even under these circumstances the policy received monetary support from Non Governmental Organizations such as World Wildlife Fund who donated a helicopter for the poaching activities and later withdrew it after it was used to kill a poacher (Duffy,2010). However, the policy reduced poaching at a faster pace than any other method as poachers feared for their lives when caught and poaching was turned into a risky business.

1.8 Penalties for poaching

Penalties in the form of fines, prison sentences or a combination of both have received little success in protecting rhinos in Africa. For example, poachers caught in South Africa are charged a penalty of more than ZAR 40000 (US\$4400) yet a single horn cost more than US\$20000 in black market. Theoretically, as much as it must reduce a rational poacher's incentive to poach it also gives more courage for poachers. Leader-Williams and Milner-Gulland (1993) argue that since a penalty does not constitute monetary fines alone, administering a penalty with a mix of a fine and prison sentence has a different effect on a poacher's behaviour. However, Clarke *et al.* (1993) looked into a penalty structure that constitutes fines only and pointed out that while higher fines might have a deterrent effect to poachers and poachers make their decisions about whether to poach based on marginal benefits and marginal fines. Hence, high fines might induce poachers to poach so as to offset the fines in the event of capture. Leader- Williams and Milner Gulland (1993) contend that if the prison sentence is less severe than the fine many poachers would simply choose prison which increase expenses to the state. Alternatively middle man would buy out poachers they hired if the fine is less severe. However, most African countries are practicing penalties and it seems they are not contributing much to the reduction of poaching due to the marginal benefit achieved when poaching.

A number of studies have concluded that stricter wildlife protection laws are not sufficient in reducing poaching without effective enforcements. Studies by Martin (1998, 2001) and Yonzon (2002) report that increase in law enforcement and increased patrols reduce poaching significant in the long run and a lack of these increase poaching two fold. However, as much as this may be close to reality only a few studies have tried to measure the adjustment of

poachers in line of effective protection mechanism. Studies done in Nepal by Gurung and Guragain (2000) underlines that the ineffectiveness of anti poaching enforcement is affected by the adaptation of poachers to those enforcements. Furthermore, it notes that as poachers become familiar with the enforcements, poachers can increase their poaching success. However, Adhikari (2002) posit that a change in enforcement halted poaching for many years in Nepal. Therefore it is necessary to revise anti poaching enforcements each year.

WHAT SHOULD BE DONE?

1.9 Legalize or not

According to CITES only South Africa is allowed to export white rhino horn. CITES regulations allow trading of white rhino in South Africa and Swaziland for exclusive purposes of international trade and hunters' trophy. However, it was discovered that at least 15 rhinos are shot in true trophy hunts and more than 200 are shot by pseudo trophy hunts where the hunt is only for horns to be sold in Asian markets (Burgess, 2012).

Legalization has drawn more criticism from a number of Non Governmental Organisations who see this as a reversal of all years in curbing poaching. Rademeyer (2012) insists that legalizing trading of rhino horns may not achieve any of its goals because rhino horns are price inelastic. Therefore, it would motivate more poachers or criminals to make big money. However, resource economists argue that the legal trade would make the horns available in the market, thereby reducing prices in the black market. Heinstein (2012) argues that while poachers have a US\$400000 incentive to kill a rhino, conservationist do not have a US\$400000 to save one. The issue of legalization is a complex one due to the reason that the rhino market is not known. What if it is legalized and in the long run it is discovered that the market is very larger than was assumed? This would mean all the efforts done in protecting rhinos would be

a waste, hence, legalization is one of the trickiest routes to take currently. Heinstein (2012) concludes that new methods are needed to save rhinos from extinction.

1.10 Forensic technology trials

South Africa has already rolled out a forensic project that would help in combating wildlife crimes (CITES, 2013). The use of seized wildlife products to crime scenes and implicated criminals would help in the prosecution of offenders. Therefore, the new Rhino DNA Index systems allows individual rhinos to be identified from blood, horn, tissue e.t.c. The use of DNA samples in illegal trade is said to be effective in South Africa and recently a Kenyan investigation was assisted by DNA Analysis. Kenya, Swaziland, Namibia, Botswana and Zimbabwe have submitted their samples to be included in the database (CITES ,2013). Furthermore, conservation officers have been trained in handling of DNA samples that could be used in court. Hence, the new technology is worth trying because it can be used in the prosecution of criminals.

1.11 Using radio tags /collars

The use of radio tags or collars have been witnessed in a number of species ranging from fish to reptiles, as well as, large mammals like bears and wild dogs (Mills and Gorman, 1997; Jepsen *et al.*, 2001). This method has been with limited success in rhinos according to a study by (Linklater, 2003). A number of disadvantages have been recorded with the use of radio tags. These problems range from false transmission, ineffective designs of collars such that Rhinos injure themselves (Dinerstein *et al.*, 2001). Apart from these, the attachment of the radio tags is a harmful process on its own that can lead to fertility problems and death. Moreover, the tranquilisation technique is said to have serious complications to rhinos (Linklater, 2006). Therefore, all these problem makes the method a risky option in protecting rhinos.

1.12 Penalty increases

Increasing severity of penalties is one of the suggested methods by Leader-Williams & Milner Gulland (1993). The authors suggest that owing to difficulties of penalties enforcement sentencing dealers as well is the key. A penalty that is not fixed is said to be a deterrent, for instance varying penalty with output (number of horns) is more effective than a fixed penalty. A typical case in Nepal is when wildlife offences were given severe penalties and it deterred poachers (Martin, 1998). Therefore, a blend of harsher payments and penalties are needed in curbing rhino poaching in Africa.

1.13 Sustainable approach

The sustainability approach aims to maximize benefits of wildlife to those who live on it (Child, 2012). Four concepts are covered, that is price, subsidiary, proprietorship and adaptive management. Adaptive management covers the learning processes linked to stakeholders and change. Subsidiary describes nested institutions need to build from bottom and price-proprietorship suggests that the wildlife is valuable and if this value accrues to landholders they would guide wildlife as they manage their livestock. This approach is usually successful when proprietorship is strong and prices are high. If the proprietorship is strong and prices are low, open economy exists and wildlife is exploited. According to Child (2012) park agencies have little income to fight poachers and as a result they switch to profit enterprises. Child (2012) suggests devolving of rights to landholders by reducing regulatory restrictions and encouraging rhino trade to drive prices through innovation.

1.14 Use of Unmanned aerial vehicles (UAVS)

Unmanned aerial vehicles also known as drones have been used successful by the United States army when targeting Al Queda militants in Somalia, Pakistan and Yemen. Drones can be very useful in combating poaching because they have cameras or can take videos of the poachers. This will help in the prosecution of the offenders. Moreover, they can be equipped with missiles

that can be launched to targeted poachers without being noticed. They can stay afloat for over 24 hours depending on the model of the drone. However, the only issue is that there are very expensive and need huge investments from the government if ever they can be used as an anti-poaching method.

1.14 Conclusion

Rhinos are still threatened in this century because many African governments have little political will in protecting rhinos. Even though the rhino horn trade was banned in 1977 limited success has been achieved with the current protection strategies. Therefore, using Forensic tests, shoot to kill policy and new strategies maybe the only way to avoid rhino extinction.

RECOMMENDATIONS

There is an urgent need to implement serious anti poaching strategies that would reduce the poaching rate. The shoot to kill policy that was practiced in Zimbabwe had the fastest results and reduced poaching even though it was later criticized as violating human rights. The same policy can be reintroduced because animals have a right to live and co-exist under animal welfare rights. Of all the methods tried up to date it is the only one that can give a clear signal to poachers that rhinos deserve to live. This policy can be used with new strategies like forensic technology and others.

Legalization of rhino horn sales would force poachers to kill more rhinos so as to increase the rhino horn stocks. Therefore, this would lead to the extinction of rhinos by making the rhino horn very expensive in the market. Therefore, it is quiet clear that in order to save rhinos from extinction a strong political will and commitment from African governments are the key. Every government should be willing to support every measure that is meant to address poaching. Heavy investments are to channelled to anti poaching methods in order to stop the poaching

appetite. The use of drones as an anti poaching strategy is inevitable because currently it seems as the only method that would not endanger the lives of the rangers or wildlife caregivers. Absence of such a will would imply that the next generation would be learning about extinct rhinos, just as the current generation learned about dinosaurs.

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