Who Pays for Wildlife Conservation in Tanzania and Who Benefits?

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Abstract:

The question on 'who pays for wildlife conservation and who benefits' is insufficiently addressed. The contribution of the people sharing the land with wildlife is often overlooked. The opportunity costs they bear for the sake of conservation and the economic losses they incur as a result of property damage are barely regarded as contribution to conservation. In this paper I argue that, local people pay for wildlife conservation through the wildlife-induced costs. Yet the benefits they receive are very minimal as they barely offset the direct wildlife-induced costs or compete with returns from alternative land uses which are ecologically destructive. The huge benefits of conservation are realised by other stakeholders who do not necessarily bear the costs. This paper commences by giving a brief historical review of wildlife conservation in the country before showing how local people are involuntarily forced to pay for the resource. Further to this, the categories of stakeholders in the sector who reap the benefits from the resource are identified. The paper also analyses the current efforts by wildlife agencies to reduce the costs of living with wildlife. Flaws encountered in these efforts are presented. In conclusion, development of appropriate mechanisms is recommended in order to balance the benefits and costs with a view of justifying the existence of the resource and hence ensuring its sustainability.

Key words: *wildlife conservation, costs, benefits, protected areas, wildlife species, local communities, Tanzania*

1.0 INTRODUCTION

Tanzania is one of the largest countries in Sub-Saharan Africa. Spanning a total area of 945,166 Km^2 it is almost four times the size of United Kingdom. It is the 31st largest country in the world. Over 30% of the country's land surface is devoted to wildlife conservation under different protected Areas categories (i.e. National Parks, Ngorongoro Conservation Area and Game Reserves: Figure 1) Human settlement is prohibited in the land occupied by National Parks and Game Reserves and allowed in Ngorongoro Conservation Area and Game Controlled Areas. The Government has ambition of including more areas with unique biological values into country's protected areas network (MLHUD1995; MNRT 1998)

Tanzania's commitment to conservation is inspired by the fact that wildlife sector is the basis of Tanzania's billion dollar tourism industry providing over 40% of the nation's foreign exchange earnings. These earnings are realised through hunting concessions and trophy licences, export of live animals and from non-consumptive tourism conducted in the country's spectacular game parks and reserves. Tourist hunting generates approximately US$27 million gross and earns the Wildlife Division some US$10 per annum (TDPG 2006). An estimated 644,144 tourists who visited the country in 2006 earned the country some US$ 862 million, up over 230% on 1995 (MNRT 2006). Backing the economic

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motive of wildlife sector, Julius K Nyerere, the first President of Tanzania viewed tourism as insurance against economic uncertainty. He was once quoted as saying:

> "I personally am not interested in animals. I do not want to spend my holidays watching crocodiles. Nevertheless, I am entirely in favour of their survival. I believe that after diamonds and sisal, wild animals will provide Tanganyika with its greatest source of income. Thousands of Americans and Europeans have the strange urge to see these animals" (quoted in Levine 2002:1047)

Despite the economic importance of wildlife nationally, the local communities have barely derived benefits sufficient enough to offset the wildlife-induced costs. This has greatly diminished incentive for local people to support conservation efforts.

Figure 1 Wildlife Protected Areas of Tanzania and some districts with high incidences of crop damage, livestock depredation and human-related accidents (1. Rombo; 2.Mkuranga; 3. Rufiji; 4. Kilwa; 5. Liwale; 6. Tunduru; 7.Kilombero; 8. Kondoa)

2.0 STATE, WILDLIFE CONSERVATION AND RURAL COMMUNITIES IN TANZANIA

The traditional rights over access and use of wildlife resource by rural Tanzanians were terminated following transfer of proprietorship and user-rights of resources from the natives to the State. The German rule enacted the first wildlife law prohibiting hunting in 1891 (URT 1998), in which hunting by Africans was classified as poaching and militaristic strategy was used to enforce the law against hunting. Prohibitive mechanisms were set to lock the natives from using the wildlife resource. These mechanisms entailed introduction of licensing system and banning the use of indigenous weapons in hunting. The expensive license fees, the mandatory condition set for natives to secure governor's consent before issuance of the license and the law prohibiting the natives from owning rifles barred them from hunting important species like antelopes, buffalo (*Syncerus caffer*) and hippo (*Hippopotamus amphibius*). The only species they could hunt without a license were those considered to be vermin by European settlers. These included bush pigs (*Potamochoerus* spp.), warthogs *(Phacochoerus aethiopicus),* porcupines (*Hystrix* spp.), and monkeys (*Cercopithecidae* spp.). The 1900 convention also encouraged killing of predators like lions (*Panthera leo*), leopards (*Panthera pardus*), wild dogs (*Lycaon pictus*) and spotted hyena (*Crocuta crocuta*) on similar grounds.

While campaigns were being intensified to end 'cruel, wasteful and barbarous African hunting' in order to evade a risk of game depletion, Tanzania's wildlife areas such as Serengeti and Selous were increasingly becoming Europeans' favourite hunting grounds for the big game. The first European hunters included J.A. Hunter, S.E. White and R.J. Cuninghame. White and Cuninghame reported huge concentration of wildlife populations in Serengeti 'especially lions although they saw no elephants' (Amin et al 1984:130). Crusade of native rights over wildlife was passed over to the British Administration that succeeded Germans in 1920 following their defeat in the World War I. The British administration viewed wildlife as a source of economic revenues or direct benefits through use of resources: recreation, resident hunting and game viewing.

The British Administration enacted the first comprehensive wildlife conservation legislation, the Game Preservation Ordinance of 1921. Pursuant to the provision of this ordinance, a number of Game Reserves were gazetted. These imposed more opportunity costs to natives through loss of access to resources such as firewood, wild fruits, medicinal plants, arable and grazing lands and spiritual sites. Natives knew these reserves pejoratively as 'Shamba la Bibi (Queen's farm) since all wildlife was symbolically and legally declared the property of the Queen of England.

The London-based Society for Preservation of Flora and Fauna of the Empire (SPFFE) spearheaded the idea of more restrictive category of protected areas i.e. National Park. In 1930 SPFFE sent Major Richard Hingston to the Eastern and Southern Africa colonies to investigate the potential for developing a nature protection programme (Adams & McShane 1996; Bonner 1993). Hingston's report recommended that man and animals should be placed in two permanently separate compartments in order to achieve a dual objective of preserving nature while not inconveniencing man (Bonner 1993). Basically, this recommendation was advocating eviction rather than safeguarding the interests of the natives since there was no idle land for the National Parks. Nine parks were proposed in

the five colonies including Tanzania's Serengeti, Kilimanjaro and Selous (Adams & McShane 1996).

Hingston's report accorded the highest priority to the interests of the Europeans. The suitability of an area as a national park was justified by its unsuitability for alternative uses by the Europeans. For example, Serengeti was found an ideal place for a national park because its insignificant mineral deposits, infestation with tsetse flies and scant rainfall made it unattractive to European miners and farmers (Bonner 1993). Relocations of the natives in favour of the protected areas were justified on the grounds of 'saving the interests of the Empire.' No consultation was sought from the natives who had to bear the social and economic costs of the process.

At independence Tanzania inherited the colonial conservation policies uncritically and more vigilance was observed in pursuing these policies. The economic potential of wildlife sector justified continuation of colonial conservation policies. No radical changes were adopted to address the customary rights which the local people lost during the colonial regime (Neumann 1996; Levine 2002). Essentially, the wildlife-related benefits targeted the entire nation and foreign interests, and not communities living with wildlife and paying exorbitantly (through different costs associated with conservation) to upkeep this resource. Over half of the wildlife population roam outside the protected areas where through interaction with human interests they threaten lives and livelihoods. The Wildlife Policy of Tanzania (URT 1998) acknowledges the marginalization of rural communities regardless of the costs they incur from wildlife. It states that "…villagers are neither able to afford the resident license fees nor to use traditional weapons under current legislation." The resident hunting industry instead benefits the richer urban dwelling Tanzanians and non-citizen residents.

3.0 WHY ADDRESS THE QUESTION OF WHO PAYS AND WHO BENEFITS?

There is increasing global recognition that reducing the wildlife-induced costs to local people by making conservation a competitive form of land use is crucial if wildlife has to justify its existence. A growing research-based literature indicates that social and economic costs associated with land alienation, forceful eviction and increased damage to property and life has often resulted into local resentment towards conservation interventions. This also increases illegal activities. Previous studies in Serengeti attributed wildlife poaching to increased crop loss (Loibooki et al 2002; Kideghesho et al 2005). Strong opposition against conservation programme and protected areas by local communities around different protected areas have been linked to crop damage and opportunity costs of land and other resources (Newmark, et al. 1993; Songorwa 1999; Kideghesho et al., 2007). Local communities living around Selous Game Reserve, indicated their willingness to support conservation efforts on condition that their interests and livelihoods are guaranteed (Gillingham and Lee, 1999). In Kenya's Laikipia District, crop raiding and threat to human life triggered hostility and opposition to conservation of wild animals among the peasants (Gadd 2005). Farmers who lost crops to elephants (*Loxodonta africana*) were more negative to Maputo Elephant Reserve, in Mozambique than the non-victims (De Boer and Baquete 1993). The families, which were evicted from Lake Mburo National Park, Uganda in 1983 and allowed to resettle in 1986 made a deliberate destruction of the area's conservation value by slaughtering the wildlife in order

to preclude the possibility of being re-evicted (Hulme 1997). In Norway, farmers who suffered huge losses from depredation of sheep expressed negative attitude toward large carnivores (Kalternborn et al 1999). In Wisconsin, USA, extermination of the predator population was highly preferred as option by farmers who reported losses to wolves (*Canis lupus*) and other predators (Naughton-Treves, et al. 2003). While these experiences are just few cases, it is obvious that unless wildlife costs are adequately addressed conservation is unlikely to succeed.

4.0 WHY AND HOW DO RURAL COMMUNITIES PAY FOR WILDLIFE CONSERVATION IN TANZANIA

Rural communities, by virtue of sharing immediate boundaries with wildlife, are potential losers due to havoc wreaked by wild animals. Wildlife generated costs worsen the poverty situation and vulnerability to these communities constituting the majority of poor Tanzanians. About 22% and 39% of Tanzanians live below the food poverty line and basic needs poverty line respectively (NBS 2002) using less than US$ 1 per day. The Wildlife Conservation Act (URT 1974) allows some human use in Game Reserves such as hunting for meat so long the permit is obtained from the relevant authorities. However, rural communities have never been able to use this privilege. Firstly, because of ignorance about existence of this provision (Madulu 2001) and secondly, unable to afford the resident license fees and modern weapons as the use of traditional weapons is prohibited by the current legislation (URT 1974; URT 1998). The argument that wildlife conservation is an alternative form of land use is, therefore, redundant to most of the rural communities. Existence of wildlife as a liability rather than an asset does not motivate rural communities to tolerate costs generated by wildlife such as crop damage, livestock depredation and different opportunity costs. This section reviews the costs and disadvantages rural communities suffer by living side by side with wildlife. Examples are drawn from different parts of Tanzania.

4.1 Wildlife conservation-related opportunity costs

The opportunity costs can be defined as the costs resulting from forfeiting a use or value for the sake of backing an alternative use or value. Conservation is a choice that requires rural communities to sacrifice their values and uses for the sake of sustaining wildlife. These values or uses include arable lands, grazing lands, plants of medicinal value, bush meat, fuelwood and sacred shrines. Very often, under conventional conservation approach, these sacrifices are not voluntary. They normally take a form of coercive and forcefully eviction of people from their traditional lands and strict prohibition of resource use (see e.g. Homewood & Brockington 1999; Hughes 1999; Mustafa 1997; Shivji & Kapinga 1998; Emerton & Mfunda 1999; Tenga 2000; Baldus et al 2001).

Eviction and exclusion are justified on the grounds of threats posed by indigenous land use to biological values. However, sometimes this argument is speculative as it lacks empirical evidence detailing environmental changes and trends in biodiversity in relation to human land use (e.g. Mkomazi Game Reserve: Homewood & Brockington, 1999). Lack of alternatives to substitute the survival strategies foregone makes people socially and economically isolated. Three protected areas in Table 1 below epitomise the opportunity

costs associated with the decision of the State to reserve some areas for wildlife conservation purposes.

Table 1: Examples of the opportunity costs of conservation in three wildlife-protected areas of Tanzania

Forceful Eviction of peasant communities from Ikorongo-Grumeti Game Reserve in 2000 • Loss of settlements • Denied access to bushmeat • Forceful evictions of 135 and 170 villagers from Nyamuma village caused loss of assets worth US$ 891,000 (URT 2004). • Loss of agricultural land (94 000 ha) with production potential of US$ 18 million (Emerton & Mfunda 1999) • Further agricultural loss amounting to some US$ 540 000 (Emerton & Mfunda 1999)
Eviction of Maasai pastoralists from Mkomazi Game Reserve in 1988: • Loss of grazing land and water for their livestock • Infringed constitutional right to live and enjoy their respective lives • Burning of homesteads and maiming or killing of livestock • Denied their basic right to reside in their traditional and ancestral lands • Breakage of customary way of life resulting into emigration of their members to Kenya and urban areas • Limited pasture which led to exorbitant fines of up to Tshs 400 000/= (US$ 400) for livestock straying into the MGR • Infringed customary land rights of natives of Tanganyika as recognized by land laws of Tanzania • Loss of access to customary holy places and sacred shrines • Loss by diseases and starvation of livestock estimating at Tshs 10 billion (US$ 10 000) • Frequent beating and general harassment by employees of MGR • Criminalisation of pastoral activities • Loss of employment, livelihood and ultimately right to live Source: Mustafa 1997; Tenga 2000; Homewood et al; Brockington 1999
Restrictions imposed on the Maasai and their livestock in Ngorongoro Conservation Area: • Loss of crucial dry season pastures in the Oldupai George, Laetoli, Ngorongoro Crater and Northern highlands Forest Reserve • Severe restrictions on grass burning to control ticks and unwanted grass species • Prohibition of cultivation (1959 ordinance) and therefore prevalent food insecurity Source: Perkin 1997; Parkipuny 1997; Lissu 2000

Strong tendency of State intervention on customary land rights in Tanzania is responsible for most of the opportunity costs borne by rural communities. Despite legal recognition, the customary land rights have been susceptible to State decisions, in which communal lands are allocated to alternative uses such as wildlife conservation at the expense of survival strategies of the people (Table 1). Virtually, there is no security of tenure. It is reasoned that ambiguous laws lacking clear interpretation was ideological package for colonialists to

justify alienation and control of land for their interests (Tenga, 2000). Unfortunately, Independent Tanzania inherited these laws wholesale, thus making the rural communities no better off in terms of access and security to resources than before.

Eviction and prohibition over access to resources is often associated with a number of social problems such as poverty, conflicts, prostitution, robbery, increased workload, unemployment, diseases and discrimination against women. Describing the hardships inflicted by the PAs, a woman in Mariwanda village, along Grumeti Game Reserve in Tanzania argued that the government was fighting the poor people instead of fighting poverty, contrary to what it repeatedly preaches. Another victim of who was evicted from Ikorongo Game Reserve in 2001, told the presidential Commission of Human Rights and Good Governance that:

> "As of now my life is seriously impoverished. I am living by working as a wage labourer. These jobs are always limited. In case I don't get a job, I remain with no option other than 'selling my body' in order to feed my children. Currently, I have lost confidence over my body; I might have already contracted the HIV/AIDS pandemic. This makes me nervous and depressed" (URT 2004:46-47) .

4.2 Crop damage

Agriculture is the principal lifeline support entity to rural Tanzanians. It contributes to over 90% of food security and 60% of the household income of the rural people (NBS 2002). The mean area of the land owned by rural household is estimated at 6.0 acres (ibid) which represents average farm sizes of the households. However, a plethora of factors such as low soil fertility, insect pests, low technological inputs, unpredictable weather and lack of credits and markets constrain the sector. In addition to these factors, the communities living side by side with wildlife suffer the extra losses due to damage wild animals inflicts on croplands. Wild animals may result up to over 90% losses in crops (Saru 1997; Moronda 1998; Andrew 2001).

In addition to direct economic losses resulting from crop damage, there is also an element of foregoing other social and economic activities as substantial amount of resources and time are directed on guarding crops against vermin. Likewise, wild animals deter peasants from expanding their agricultural fields (e.g. in Eastern Selous Ecosystem: Masunzu 1998) and even abandon their villages by migrating to damage-free areas (e.g. see Box 2). The substantial economic losses from wildlife (Table 3 & 4) frustrate people's effort in fighting absolute poverty, a prevalent phenomenon in rural areas.

Box 2: Indirect costs of wild animals on agriculture

"Its getting worse not better. We have stopped the late crop of maize completely due to animals". "Since we were borne the elephants were here, but there was a control, a special patrol". "The biggest agricultural problem here is the animals. Even if they don't eat, they flatten it." People are returning to Bonye due to the services there and avoid the risk of children meeting the elephants on their way to school".

Quotes from villagers in Sogea Mbele village around Selous Game Reserve

Source: Adopted from Ashley et al 2002

Elephant (*Loxodonta africana*) is the most publicised problem animal causing crop damage in some parts of Tanzania. For example, in Rombo District of Kilimanjaro region, an animal is estimated to cause over 90% of the damage (Andrew 2001). The same animal also ranks the most serious vermin in villages bordering Arusha National Park (Saru 1997; Moronda 1998), Manyara National Park, Selous Game Reserve (Newmark et al 1994; Ashley et al 2002; also see table 2) and Kondoa District (KDGO 1989 –97)

Although elephant damage is considered the most serious in some parts, the nation-wide surveys (Naughton et al 1999) indicated that only 4% of farmers rank it the highest. Bush pig (*Potamochoerus larvatus*) is ranked the highest by 60% of farmers. Probably the distribution status of the two animals dictates this scenario. Bush pigs are widely distributed in the country, while elephants, despite their widespread impact on crops are restricted in few areas, very often, in protected areas. Hence farmers in elephant-free areas may have less experience of the costs inflicted by the elephants. A single night is adequate for elephants to clear the entire farms.

Other frequently reported crop marauding animals (Table 2) include buffaloes (*Syncerus caffer*), vervet monkey (*Cercopithecus aethiops*), yellow baboons (*Papio cynocephalus*), warthogs (*Phacochoerus africanus*), greater kudu (*Tragelaphus strepsiceros*) and hippo (*Hipopotamus amphibius*). Others are porcupine (*Hystrix cristata*), blue monkey (*Cercopithecus mitis*), eland *(Taurotragus oryx*), bushbuck (*Tragelaphus scriptus*), impala (*Aepyceros melampus*), black backed jackal (*Canis mesomelas*), Reed buck (*Redunca redunca*), and cane rat (*Thyronomys swinderianus*). Birds and insects also cause serious losses. In Table 2 below problem animals are ranked in terms of relative importance in wreaking havoc around five wildlife-protected areas

Table 2: Comparison of the problem animals raiding crops in areas bordering the five wildlife-protected areas of Tanzania

Protected area	**Problem animals (ranks)**					
	1	**2**	**3**	**4**	**5**	**Other problem animals mentioned**
Kilimanjaro National Park*	Monkey	Bushpig	Rodent	Birds	Baboon	-
Manyara National Park*	Elephant	Baboon	Buffalo	Warthog	Hippo	Monkey
Mikumi National Park*	Bushpig	Baboon	Monkey	Elephant	Hippo	Buffalo, porcupine
Selous Game Reserve*	Elephant	Hippo	Buffalo	Bushpig	Monkey	Baboon, warthog, porcupine, birds,
Arusha National Park**	Elephant	Buffalo	Bush pigs	Primates	?	Birds
Nationwide***	Bushpig	Birds	Monkey	Insect	Rodent	Baboon, porcupine, hippo, elephants

Source: Newmark* *et. al.* 1994; Saru** 1997 Moronda** 1998, Naughton*** *et al* 1999

The types of crops raided differ from one locality to another depending on agroecological factors. However, maize (*Zea mays*), rice (*Oryza sativa*), Sorghum (*Sorghum vulgare*), finger millet (*Eleusine coracana)*, beans *(Phaseolus vulgaris*) and vegetables are common staple foods in many areas and, therefore they are more prone to damage. Tunduru and Songea Districts around Selous Game Reserve are examples of the areas experiencing heavy losses due to crop damage (Table 3). Table 4 gives an estimate of dry weight yield for some food crops per acre (after FAO/WFP 1998) translated into monetary terms basing on wholesale price (FEW 2003; BIS 2003). This provides a general picture of the financial losses communities suffer from crop marauding animals. The wholesale prices for these crops depend on locality, season and yield.

Table 3. Crop damage (acres) caused by wild animals in Tunduru and Songea Districts (1990 – 2000) and the dry weight yields of these crops, estimated wholesale prices and financial gains per acre.

Food crop	Crop damage (in acres) 1990-2000	Yield (kg/acre)*	Wholesale price** (US$/100kg)	Yield in monetary value (US$/acre)
Maize	1125.1	600	7.5 – 25	45 – 300
Paddy	1100.7	800	30 – 60	240 – 480
Millet	731	410	5 – 20	20.5 - 82
Pulses	617	274	15 – 30	3.1 – 62.2
Cassava	667	1200	5 – 15	60 – 180
Cashewnut	810	-	-	-
Tobacco	162	-	-	-
Banana	24.9	1200	10 – 20	120 – 240

Sources: Hahn & Kaggi 2002; * FAO/WFP 1998; **FEW 2003; BIS 2003.

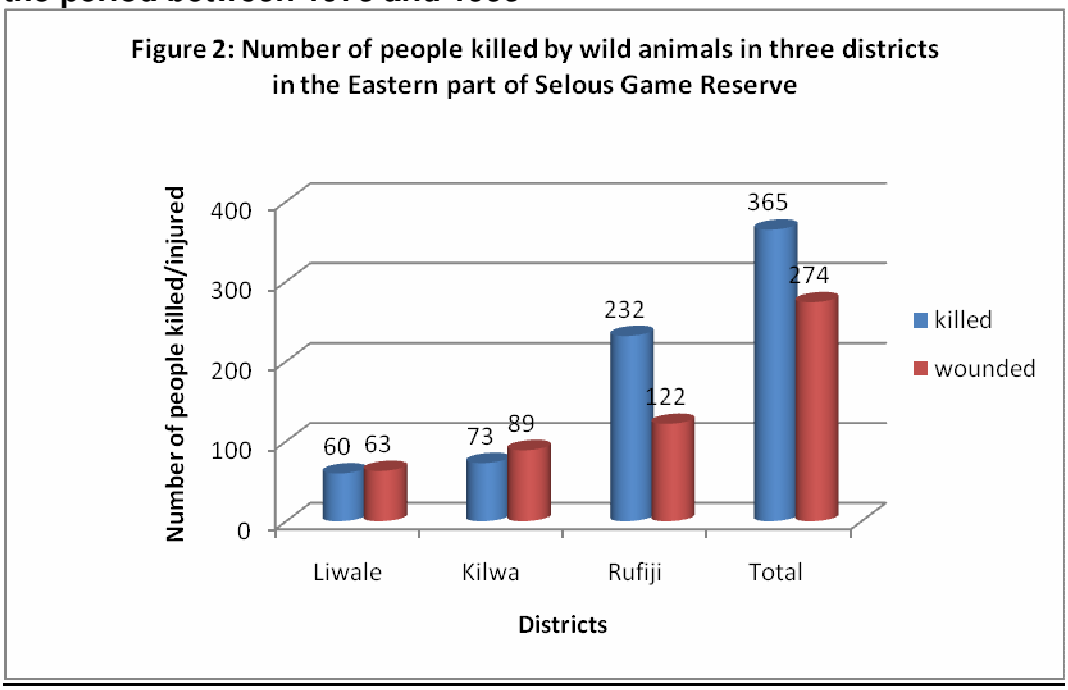
4.3 Wildlife related accidents: Deaths and injuries

The issue of people been killed or injured by wild animals in Tanzania is not an untested hypothesis. It is familiar to many people and very popular in mass media, both within and outside the country. In addition to direct attack, wildlife also transmits zoonotic diseases (diseases transmitted between wildlife, people and livestock) such as anthrax and rabies. The problem of wildlife related deaths and injuries are widespread in the country although the extent of attacks may differ from one place to another. The problem is more prevalent in Southern Tanzania. On average at least 200 people are killed by wild animals per year in Tanzania (Baldus et al 2001). The most common wild animals attacking, killing or wounding people include lions (*Panthera leo*), leopards (*Panthera pardus*), crocodiles

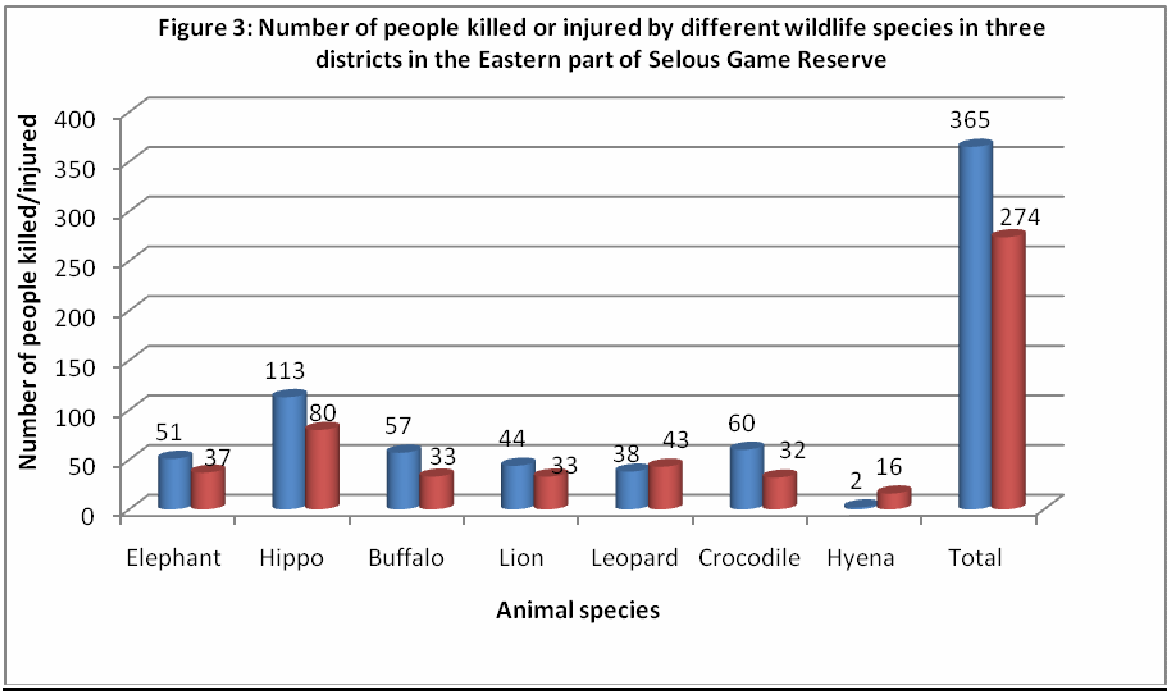
(*Crocodylus niloticus*), snakes (different species), elephants (*Loxodonta africana*), hyena (*Crocuta crocuta*) and buffaloes (*Syncerus caffer*).

Some of the frequently reported areas with incidents of animals killing or wounding people include Mkuranga, Kilombero, Tunduru, Kondoa, Liwale, Kilwa and Rufiji Districts (Masunzu 1998; Figure 1). Between 1975 and 1995 three districts bordering Selous Game Reserve in the eastern part (Liwale, Kilwa and Rufiji) had a total of 365 and 274 people killed and injured by wild animals respectively (Masunzu 1998). Liwale district recorded 60 people killed (63 injured), Kilwa 73 (89) and Rufiji 232 (122).

Figure 2: Summary of people killed or injured in Liwale, Kilwa and Rufiji Districts in the period between 1975 and 1995



Source: Adopted from Masunzu 1998

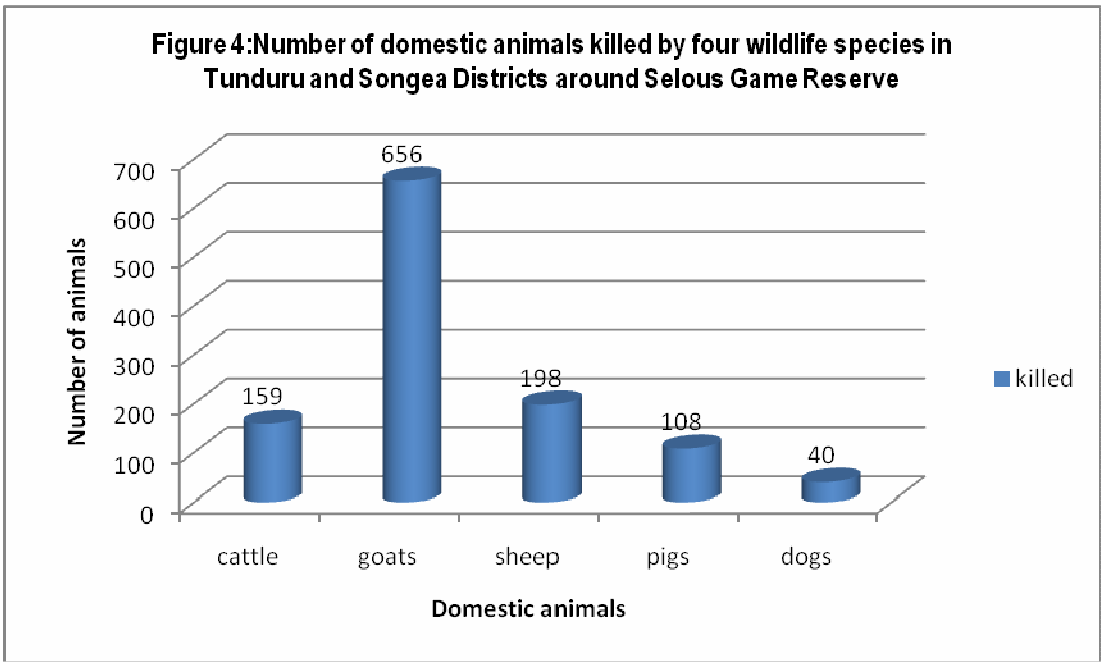


Source: Adopted from Masunzu 1998

4.4 Livestock depredation

Livestock plays a vital role in the local economy of rural Tanzanians. It is an important source of protein, income or commercial asset. Depending on locality, season, size and condition of an animal, a conservative estimate for the value of a cow can range from US$ 45-100 and a goat or a sheep from US$ 7-25 (personal experience). Other than economic role, livestock also plays an important social role. It is a symbol of status in many tribes and it serves as a commodity that can be exchanged for a wife i.e. bride price (see e.g. Loibooki et al 2002). So a loss of livestock implies not only economic loss to rural communities, but also a huge social cost.

The close juxtaposition and overlap of livestock and wild carnivores lead to depredation of the former by the latter and consequently substantial economic and social costs to rural communities who already experience a serious economic hardship. These costs translate into prevalent human-wildlife conflicts in many areas. The common predators killing livestock include lions (*Panthera leo*), leopards (*Panthera pardus*), hyena (*Crocuta crocuta*), cheetah (*Acinonyx jubatus*), wild dogs (*Lycaon pictus*) and jackals (*Canis spp.*). Tunduru and Songea Districts epitomise the problem of livestock depredation in Tanzania. Figure 4 summarizes the number of livestock killed by lion, leopard and python in Tunduru and Songea Districts in a period of 10 years from 1990 to 2000



4.5 Diseases transmission to domestic animals

There is limited literature in Tanzania documenting the economic losses that rural communities suffer as a result of diseases transmission to domestic animals from wildlife species. Few of the available literature show a bias by holding domestic animals responsible for transmitting diseases to wildlife. For example, the epidemics of canine distemper virus (CDV) and rabies in Serengeti National Park in 1993/94 and 1990/91 respectively were linked to domestic dogs *(Canis familiaris*) living on the perimeter of the park. CDV killed over 1,000 out of 3,000 lions (*Panthera leo*) (Harder et al 1995, Morell 1995, Roelke-Parker et al 1996) while rabies contributed to a drastic decline of wild dogs (*Lycaon pictus*) and ultimately their decimation from the park (Morell 1995, Roelke-Parker et al 1996).

Few studies (e.g. Machange 1997; Rwambo et al 1999) backed by pastoralists describe transmission of diseases by wildlife as a constraint to livestock production in Tanzania. Risk of livestock contracting diseases from wildlife is attributed to two major reasons. Suppression of pastoralists's strategies of managing the diseases and increased overlap of domestic and wild animals over resources such as pasture, water, salt licks and space. Previously pastoralists were able to coexist with wild animals with less risk of their livestock contracting diseases from wild animals. However, the establishment of protected areas had squeezed the pastoralists by taking the land, which was utilized for pasture. This has consequently undermined the traditional range management strategies and the scope of avoiding or coping with animal diseases (Mwamfupe 1998).

Risk of diseases transmission may also limit people's land use options. While it livestock production remains the most feasible and viable source of protein and food security to rural communities due to restrictive laws governing the use of bushmeat, wildlife and associated habitats create conducive environment for some disease vectors. For example, livestock keeping in areas bordering Mikumi National Park and the Southern part of the country is constrained by tse tse fly (*Glossina* spp), a vector for the protozoa *Trypanosoma* spp, causing sleeping sickness to people and trypanomiasis to cattle (Mofulu; Park

Ecologists, pers. comm. 2001). The most feasible and affordable control measure to this problem involves destruction of habitats by clearing of vegetation, an option that is incompatible with conservation.

Transmission of diseases between livestock and wildlife is more noticeable in Ngorongoro Conservation Area (NCA) where its management system of multiple use allows livestock and wildlife to interact. Ticks and tick-borne diseases and the potential for transmission of malignant catarrhal fever are major determinants of livestock grazing patterns, and a possible source of conflict between pastoralism and wildlife conservation (Rwambo et al 1999). Pastoralists have identified eight diseases namely East Coast fever (ECF), ormilo (turning sickness), malignant catarrhal fever, anaplasmosis, contagious bovine pleuropneumonia, black quarter, lumpy skin disease and anthrax as the most important diseases affecting cattle, sheep and goats due to interaction with wildlife (ibid).

Machange (1997) identified 11 important diseases transmitted between wildlife and livestock in five localities of NCA (Table 4). Since 1984, the incidence of tick-borne diseases including ECF and ormilo increased drastically and the average mortality rate associated with the two tick-borne diseases was 18% in adults and 52% in calves under 12 months of age (Rwambo, op. cit.)

Table 4. Important diseases that are transmittable between wildlife and livestock in 5 localities of Ngorongoro Conservation Area

S/N	Disease	Oloirobi	Endulen	Kakesio	Olbabal	Nainokanoka
1	Foot & Mouth Diseases (FMD)	W & D	W & D	W & D	W & D	W & D
2	Rinderpest	D	D	0	0	D
3	Bovine Celebral Theleriosis (BCT)	W	W	W & D	W	0
4	Bovine malignant Catarrh Fever (MCF)	W	W	W	W	0
5	East Coast Fever (ECF)	W & D	W & D	W & D	W & D	W & D
6	Anaplasmosis	W & D	D	D	D	0
7	Trypanomiasis	0	D	D	0	D
8	Nairobi Sheep Disease (NSD)	0	D	D	0	D
9	Contagious Caprine Pleuro-Pneumonia (CCPP)	W & D	D	0	W & D	0
10	Anthrax	0	0	0	W & D	0
11	Helminthiasis	W & D	W & D	W & D	W & D	W & D

Source: Machange 1997. 0 = absence, W = wet season & D=dry season

5.0 FROM 'FENCES AND FINES' APPROACH TO AN ALTERNATIVE DOGMA: 'IF IT PAYS IT STAYS'

Tanzania has embraced a global dogma that 'if it pays it stays'. This is immense shift in paradigm from the hostile 'fences and fines' which sought to mainstream wildlife and marginalise human beings. The shift is centred on the premise that, if the costs of wildlife conservation are reduced with subsequent increase of the benefits the rural communities will be motivated to align their behaviours with conservation goals. Essentially local support is important if conservation is to be ecologically, economically and socially

sustainable (see e.g. Kiss 1990; IIED 1994; Homewood & Brockington 1999; Emerton 2000). Some strategies set in Tanzania to this end include: devolving user rights over wildlife to rural communities, permitting regulated resource use in conservation areas, and improved control of problem animals (MNRT 1998).

Community based conservation (CBC) is construed as a vehicle for transforming wildlife from a liability to an asset (Baldus et al 2001; Songorwa 1999). Several CBC projects or programmes in different wildlife rich areas have been established for this purpose. These include Serengeti Regional Conservation Project (SRCP), Selous Conservation Programme (SCP), Society for Conservation and Sustainable Utilization of Natural resources in Ukutu Area (JUKUMU) and Wambi-Mbiki Community-Based Protection and Utilization Project. Tanzania National Parks Authority (TANAPA) through Community Conservation Service (CCS) effects the revenue sharing policy with adjacent communities through a fund called Support for Community Initiated Projects (SCIP) in which communities prioritize the projects to be supported by TANAPA (TANAPA 1994; Snelson 1995).

Despite the policy affirmation and the current efforts aiming at making wildlife a positive development factor, these efforts had had a minimal desired impact on the local economy. One, because the benefits that trickle down to rural communities are too low to balance the wildlife-induced costs, and two, because the forms in which these benefits are received can not offset the costs borne by individual households. The Western Serengeti Corridor epitomises the situation of imbalance between the costs and benefits of wildlife conservation (Table 5).

Table 5: Estimates of Western Serengeti economic benefits and costs for landholders

Benefits/costs	Value (USD/year)
TANAPA Support to Community Initiated Projects (SCIP)	+ 15 400
SWCP/WD community hunting	+ 3 500
Wildlife crop damage	-484 000
Agricultural opportunity costs of Grumeti and Ikorongo Game Reserve	-540 000
Total	-1 005 100

Source: Emerton & Mfunda 1999.

When distributed evenly to individual households (ca 9 500), the costs range from US$ 155 per household (for farmers bordering the Serengeti National Park and Ikorongo-Grumeti Game Reserve) to more than US$ 770 a year for illegal cultivators inside the reserve (Emerton & Mfunda 1999). Each household gets an average of US$ 2.5 per year as indirect benefits through support given in form of broad development benefits such as construction of classrooms, dispensaries and roads (ibid). The communities in Serengeti receive the benefits from two sources namely TANAPA and Wildlife Division. This implies much low benefits to communities with a single source of support. Minimal benefits and inappropriate forms in which these benefits are given to rural communities have negative implications to conservation. These implications are briefly discussed below.

Further economic analyses suggests that the government and its wildlife conservation agencies benefit more from the resource with only minimal benefits trickling down to communities. Statistics show that, between 1991 and 2001 Serengeti National Park

earned some US$ 36 388 153 from tourism. According to TANAPA and FZS (2002), the Park contributed some US$ 370 095 (which is about 1% only) in form of development projects to rural communities in seven districts bordering the park. These benefits have been decreasing with time. Table 6 below shows the indirect benefits donated to seven districts bordering Serengeti National Parks in a period of five years from 2001 to 2005. The amount per capita in each district is worked out to reflect the actual value earned by individuals.

Table 6: Indirect benefits donated to local people by TANAPA through development projects in seven districts bordering Serengeti National Park***

District	***Population in rural areas****	***Total donation in 5 years USD****	***Average per year (USD)***	***Amount per person per year (USD)***
Serengeti	161,024	248,000	49,600	0.31
Tarime	417,609	84,000	16,800	0.04
Bunda	207,124	98,000	19,600	0.09
Ngorongoro	122,838	49,000	9,800	0.08
Bariadi	572,929	67,000	13,400	0.02
Magu	377,202	25,000	5,000	0.01
Meatu	241,389	97,000	19,400	0.08

**Uhuru* (2006); **URT (2002)

*** It is assumed that all villages in rural areas access the benefits

Failure of the benefits directed to local communities to outweigh the costs they incur from conservation result into dissatisfaction among the local communities. Sometimes these dissatisfactions are prompted by failure of the benefits to address the immediate short term needs of the people. This is epitomised by the following quotes (Box 3).

Box 3: Villagers perceptions

"You say 'ujirani mwema' (good neighbourliness). But when my cattle enter the park to graze they (park rangers) punish me by heavy fines. When their elephants and buffaloes cross into my garden and clear all bananas it becomes none of their business.

Look at that portion! It was raided last night. There is nothing left! They cannot compensate me. I can neither fine nor take them to court. But why? They say this is our natural resource. It is not! It is their resource.

You have built that school (Ngurdoto) for our village. Yes, a good idea. My son asked for breakfast this morning before he left for school. I heard his mother replying, "there is no food – nothing! Didn't you see the animals eat the last bananas? We are both angry and hungry. Is this what you call ujirani mwema?."

An informal interview as directly quoted from Mzee Joseph Sangito of Ngurdoto village 10th February, 1999.

"We will be satisfied with the meat, but where is '*ugali*' (staple food made of maize flour)? Some meat goes to Duthumi but not here. You have to buy the meat of the animal which ate your crops yesterday".

A quote from Sogea Mbele village around Selous Game Reserve.

Source: Ashley et al 2002

6. 0 WHO BENEFITS FROM WILDLIFE CONSERVATION?

Unlike rural communities, other stakeholders of the wildlife sector enjoy the benefits from wildlife regardless of the resources they invest and disadvantages they suffer. This section attempts to identify the possible beneficiaries from the wildlife sector.

Poachers

People who utilise the resource illegally i.e. poachers, are one of the key beneficiaries of wildlife resources. For instance, cost benefit analysis of poaching in Serengeti National Park (Hofer et al 2000) indicates that: a poacher for bush meat earns an income of US$20 per trip. The costs involve US$2 for weapons and traps and a fine of US$3 in case of arrest. The net benefit, therefore, is US$15. Illegal hunting in Western Serengeti yields an approximately annual supply of 11 950 tones of bushmeat from about 160 000 animals killed annually (Hofer et al 1996; Loibooki et al 2002).

Corrupt government officials

Wildlife also benefits the corrupt officials. The Presidential Commission of Enquiry against Corruption (Warioba Commision 1997) accuses some government officials both within and outside the sector for corruption. The specific area mentioned is hunting industry in which dubious hunting transactions that are not commensurate with sound management of wildlife resource were revealed. Similar accusations were raised by the Tanzania

Development Partners Group (TDPG 2006) decrying the few key government officials involved in allocation of hunting concessions for leasing the concessions at prices far below market value irrespective of size, quality and income potential. According to TDPG, despite the increasing number of hunting clients the income to Wildlife Department has remained the same. The problem of corruption in wildlife sector has often become one of the hot topics in the National Assembly. In the recent session of the National Assembly (April 2008) one of legislators revealed that Tanzania loses around US$60 annually in the tourist hunting industry as a result of corruption and poor management of the country's wildlife industry. The legislator uncovered that the loss of revenue is partly caused by collusion between foreign tourist hunting companies and officials in the Ministry of Natural Resources and Tourism. He was quoted in the ThisDay Newspaper (Friday 25 April 2008) as saying "The hunting sector is dominated by few private (foreigners) in collusion with officials in the Wildlife Division, who have adopted a command system and benefit from such system."

Foreigners, Investors and NGOs

The investors in protected areas such as hoteliers, tour operators and professional hunters also reap the benefits from wildlife whose survival is a menace to rural communities. The description above on corrupt officials also suggests that foreigners are among the top beneficiaries of Tanzania's wildlife resources. Foreigners collude with corrupt Ministry officials to reap the benefits. Some Legislators in Tanzanian National Assembly decried the lack of transparency in the allocation of hunting blocks (ThisDay, Friday 25 April 2008). They revealed that foreign-owned hunting companies are given licences on lucrative hunting areas, in the process leaving indigenous Tanzanians on the wayside. Twelve foreign companies were given 57 prime hunting blocks out of the total 147 blocks allocated in 2006, with each company owning on average five blocks (ThisDay, Friday 25 April 2008). Ten local companies owned only 16 hunting blocks in prime hunting areas, on average owning two blocks per company. Some Non-Governmental Organizations (NGOs) also benefit from wildlife resources. Although some such asWWF, IUCN and FZS, to mention a few, play a genuine and crucial role in conservation of wildlife resources, some are just established as 'money-making machines.' These NGOs identify themselves as conservation organizations and collect funds from different donors and conservation agencies while in actual fact the money channelled to conservation is very minimal.

State

As stated above government loses considerable amount of revenues from wildlife sector. However, it remains one of the key beneficiaries of wildlife resources in Tanzania. For instance, from 1995 to 2007 the country earned about US$ 8,600 million from tourism activities (MNRT 2006). In 2004 and 2005, earnings from sustainable consumptive use of wildlife resources were US$12,532,996 and 12,665,063, respectively. The increase was attributed to an increase in tourist hunting and government's effort to strengthen tax collection. In 2005, a total of 2,474 licenses were issued to tourist hunters, compared to 2,148 in 2004. In 2005, a total of US$12,126,564 was earned from licenses issued, compared to US$9,846,311,105 in 2004, equivalent to an increase of 23.2 percent. That increase was attributed to increases issued for harvesting wildlife resources (Economic Survey 2005).The government of Tanzania charges different fees for different animal species (Table 7). While these animals generate substantial amount of revenues to government treasury, they impose considerable financial and social costs to local people.

Table 7: Hunting fees for some animals species in Tanzania

Species	*Fee*
African elephant (Loxodonta Africana	5,000
Buffalo (Syncerus Caffer)	1,050
Eland	1,050
Gerenuk	1,625
Greater Kudu	1,465
Hippopotamus	1,050
Leopard	2,500
Lion	2,500
Nile Crocodile	1,050
Oryx	1,090

Local authorities

The existing mechanisms of benefits distribution favour the institutions and individuals who do not bear the costs of conservation. The Wildlife Department, for example, gives 25% of the revenues generated through tourist hunting and other activities to District Councils under which the hunting is conducted. However, most of these revenues ends at the district level and do not find their way down to communities. Since the discretion of allocating the funds rests with the Councils, the benefits may be directed to areas basing on priority of the council and not the impact wildlife has on communities. This is corroborated by words quoted from a resident around Selous Game Reserve: "*Money that goes up does not come down. We want to control it here"* (Ashley et al 2002). The then Minister for Natural Resources and Tourism gave further verification on this when she was responding to a question in the National Assembly on 28 July 2005 about compensation for wildlife-related costs. She criticised the district councils for using their share of revenues from hunting for (paying) sitting allowances instead of directing it to target communities. Even if some of this money gets to the communities, all villages in the district are rewarded equally regardless of the costs they incur. The communities therefore fail to differentiate between the conservation-related benefits and other handouts given by the government. One village chairman in Western Serengeti complained that some villages which do not even know how an elephant looks like, were equally benefiting from the resource (Kideghesho, unpublished data).

Rich Tanzanians

The Wildlife Policy of Tanzania (MNRT 1998) admitted that the wealthy people living in urban areas earn more benefits than the rural people bordering the wildlife areas. It states that the rich urban dwelling Tanzanians "apply to shoot a number of animals well below market prices and at considerable opportunity cost to those rural communities whose land they hunt". Likewise, the revenues that accrue to Central Government in form of taxes (from TANAPA, NCAA, investors) and selling the hunting quotas in Game Reserves and Game Controlled Areas are shared by the entire population of Tanzania.

6.0 WHAT ARE THE IMPLICATIONS FOR CONSERVATION?

Winning local support and getting people abstain from unsustainable behaviours such as poaching is unlikely if the benefits of conservation cannot exceed the costs. Illegal activities are justified as a way of self-compensation from the costs inflicted by wildlife. For example, wildlife in Western Serengeti is considered as both a cost due to crop damage and a benefit due to illegal hunting (Johannesen & Skonhoft 2002) done during the annual

migration of wildebeest (Emerton & Mfunda 1999; Holmern et al 2002; Johannesen & Skonhoft op. cit.; Loibooki 2002).
High price/cost ratio from a resource and high opportunity cost of conservation creates an incentive for overexploitation of a resource and conversion of habitats to alternative uses. Illegal hunting in Serengeti, for example, still features as a major problem despite the game cropping operation conducted by Wildlife Department through Serengeti Regional Conservation Programme with the aim of providing rural communities with game meat at low price. Illegal hunting generates an economic value 45 times greater than legal meat (Holmern et al, 2002). Similarly wildlife habitats are subjected to niche competition which may lead to conversion to alternative uses such as agriculture if the latter generates higher revenues and profits than wildlife conservation.

Violation of law in order to survive is the most probable option where alternatives to livelihoods are limited (see e.g. Baldus et al. 2001; Holmern et al 2002; Loibooki et al 2002). For example, the majority of people arrested for illegal hunting in Western Serengeti were typically poor males that owned few or no livestock (Loibooki et al 2002; Holmern 2002) implying that poaching is pursued as an economic necessity to cope with poverty. The fact that hunger does not respect law, is backed by Low et al (2001) who observe that "When costs for preserving biodiversity implies that your children starve, this is not acceptable situation for anyone".

The benefits, which are neither pragmatic nor focusing on immediate needs for the survival of the people, will rarely change people's deep-rooted antagonistic attitude towards conservation. Support in form of social amenities can not offset the costs incurred by individuals or households and can not overcome their vulnerability. For example, construction of dispensary, classroom can not substitute fuel wood or grazing land given up for conservation. In essence, the long-term benefits can hardly be appreciated if more pressing and immediate problems are overlooked.

The costs of living with wildlife can be a vital driving force for the policy reforms. In Tanzania and elsewhere in Africa, long history of human wildlife conflicts has necessitated the policy changes focusing on reducing the costs of living with wildlife (e.g. see TANAPA 1994; Dower 1995; Snelson 1995; Hackel 1998; MNRT 1998; Emerton & Mfunda 1999; Songorwa et al 2000; Hughes & Flintan 2001)

6.0 CONCLUDING REMARKS

An increasingly proliferation of community-centred slogans in conservation such as *'use it or lose it, 'conservation by the people for the people'* '*if it pays it stays'* and '*beyond the fences'* reflects a tremendous change in conservation philosophy. Essentially, this is a positive advance away from a hostile 'island mentality' which assumes that '*fences and fines'* approach is a panacea for wildlife conservation. While this shift in paradigm is imperative in ensuring sustainability of wildlife resources, a number of challenges should be addressed for desired effects in terms of harnessing wildlife for livelihood gain and therefore reducing antagonistic attitude held by rural communities towards conservation. The question of who pays for wildlife conservation has not been adequately addressed. The benefits are too minimal and mechanisms to ensure that the benefits provided are pragmatic and meet the immediate interests of the people (such as food, fuel, water and pasture) before switching to secondary needs (such as building dispensary, schools or roads) are not in place. Another important question lies on who benefits from wildlife

resource? This is important question in ensuring that those deriving benefits from wildlife resources pay the actual costs. The rural communities may lose heart if what they get is relatively minimal compared to gains going to those incurring minimal costs.

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