

# Wildlife Conservation Leases are Considerable Conservation Options outside Protected Areas: The Kitengela - Nairobi National Park Wildlife Conservation Lease Program

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## History

In the year 2000, the Maasai community with the help of Kenya Wildlife Service and Friends of Nairobi National Park [FONNAP] established a program that generates conservation benefits through co-existence with wild life.

## The Nairobi National Park and kitengela - Athi-Kaputiei plains

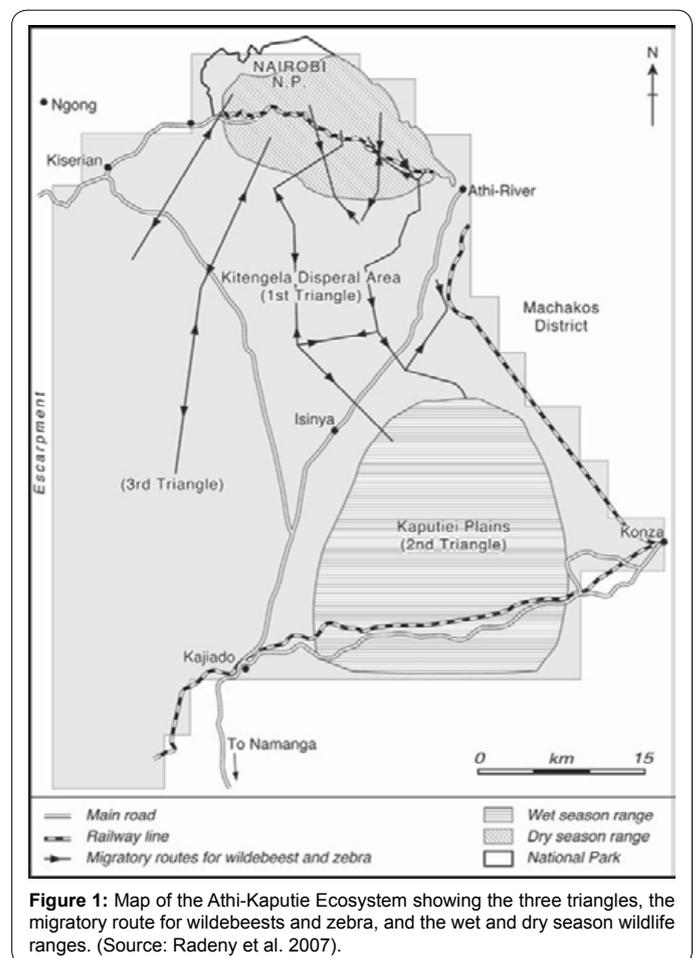
The Nairobi National Park (NNP) is located in South-western Kenya and encompasses an area of 117 km<sup>2</sup>. It is one of Kenya's most visited Parks, located at the boundary of Nairobi, Kenya's capital city. The NNP is fenced on the northern boundary to separate it from the Nairobi metropolis as well as to the eastern and western boundaries. The southern boundary which lies along the Empakasi River is open and adjoins the Kitengela, an area of 390 km<sup>2</sup>. Kitengela is one of the three triangles that comprise the larger wildlife dispersal area for NNP called the Athi-Kaputiei Plains (AKP), an area of 2200 km<sup>2</sup>. The rangelands of AKP are private land, majority of it owned by the pastoral Maasai, who have historically shared their land with wildlife [1].

The Nairobi National Park together with AKP comprise the Athi-Kaputiei Ecosystem (AKE) whose limits are bounded by the Rift Valley escarpment to the west, the Nairobi-Mombasa railway line to the east and the Konza-Magadi railway line to the south (Figure 1). The area is dry and the annual rainfall increases from 500 mm in the southeast to 800 mm in the northwest. The AKE ecosystem support 24 species of resident large mammals, but the park itself is too small to support viable populations of most of the large herbivores. Consequently, some herbivore species such as the wildebeest (*Connochaetastaurinus*Burchell), zebra (*EquusBurchelli*Gray) and eland (*Taurotragusoryx*) use the park as a dry season (June-November) refuge and disperse to the private land in the AKP in the wet season (March-May) for forage and calving.

The AKP is the traditional home to the Kaputiei Maasai pastoralists, whose main livelihood is livestock production, keeping cattle, sheep and goats in the vast plains. When NNP was established in 1946, the Kitengela plains were declared but never formally gazetted as a wildlife conservation area. In the mid-1970s, land in the AKP was privatized with the creation of the Kitengela Group Ranch covering an area of 18,292 ha (45,200 acres) and collectively owned by 215 members of the Maasai community. In 1988, the Kitengela Group Ranch was sub-divided into individual plots of roughly 215 acres allocated to each of the 250 members. The process of land privatization and sub-division followed in the entire Kajiado County as the Maasai landowners passed on plots to several inheritors, and increased land sales mostly to non-Maasai's interested in agriculture [2]. The land sales, alongside rapid increase in human population, has resulted in land uses such as expansion of urban centers (e.g. Kitengela and Athi River) and industries (e.g. the Export Processing Zones: EPZs), large scale irrigated horticultural schemes, quarrying and expansion of permanent settlements with fencing, which have restricted the movements of livestock and seasonal dispersal of wildlife between NNP and the AKPs [1]. These changes in land use have

contributed to large declines in the populations of wildebeest in the ecosystem from an estimated 38,000 in 1978 to about 10,000 in 2012 [3].

While outside the Nairobi National Park in AKP, the wildlife occupy the private land of the Maasai pastoralists creating human-



**Figure 1:** Map of the Athi-Kaputiei Ecosystem showing the three triangles, the migratory route for wildebeests and zebra, and the wet and dry season wildlife ranges. (Source: Radeny et al. 2007).

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wildlife conflicts through competition for water and pasture with livestock, transmission of infectious diseases to livestock, and livestock predation by the large carnivores. The NNP is amongst the most visited parks in Kenya accounting for 23% of park visitors, and thus generating very high revenues from wildlife tourism (World Resources Institute, 2007). The absence of a revenue sharing mechanism with the Maasai landowners in AKP whose land is critical as a dispersal zone for wildlife that attracts tourists to the park means that landowners have very little or no incentives for having wildlife on their private lands. Consequently, the lack of direct monetary benefits from the wildlife coupled with the increase in human wildlife conflicts in AKP over the years made Maasai households intolerant to and excluded wildlife on their land through fencing and direct killing of predators. Without any intervention to address the challenge of land use change with negative implications on wildlife dispersal, the future of Nairobi National Park and the viability of wildlife in the Athi-Kaputie Ecosystem are in jeopardy.

### The Wildlife Conservation Lease (WCL) Program

In April 2000, the Wildlife Lease Conservation (WCL) Program was initiated to ensure that wildlife could move freely between the Nairobi National Park and Kitengela- Athi-Kaputie Plains. This PES program is currently managed by The Wildlife Foundation (TWF), a locally incorporated Non-Governmental Organization (NGO). In 2008 [4], the TWF was awarded grant by the Global Environment Facility (GEF) through the World Bank in the category of a Medium-sized Project (MSP) to pilot the expansion of the WCL as a demonstration project for effective conservation of wildlife on private lands outside protected areas.

The wildlife conservation lease program is a model that is aimed at providing incentives to the Maasai community in return to hosting wildlife in their privately owned land parcels south of Nairobi National Park which is payable three times a year, in January, May and September. Ksh300 price per acre was determined after a feasibility study was carried out to determine the average income level per household for the sale of milk or cow dung manure, skins or hides per month. The Ksh300 was equivalent to US\$4 at that time. Yet twelve years later, the price tag per acre is still maintained for all the lease holders throughout the project.

In the Wildlife Conservation Lease initiative, the Wildlife Foundation (TWF) - an NGO registered to manage the program, signs a contract with the landowners, which requires them to allow free movement of wildlife on their land (Figure 2) and to meet the following conditions;



Figure 2: Lease participants waiting for their pay checks.

- To manage the land for the benefit of wildlife and sustainable livestock grazing
- To leave land under lease open and not to install any perimeter fencing on my land
- NOT to cultivate, mine or quarry in any manner the land under WCL
- keep land under lease free of buildings or any other structures
- To protect indigenous plants and trees

In return, the households are paid an annual fee of Ksh. 300 (US\$ 4) per acre in three installments [5]. During the pilot phase of the WCL supported by the GEF/World Bank, the TWF enrolled landowners based on the following criteria;

- Land adjacent to Nairobi National Park
- Willing land owner
- Land unfenced (open rangeland)
- Connectivity to other enrolled land parcels
- Proof of land ownership using a title deed

### Objectives

The key objective of the WCL to “ensure long term ecological viability of Nairobi National park by maintaining seasonal dispersal areas and migration corridor on adjacent privately owned lands and demonstrating the use of wildlife conservation leases as a conservation tool outside protected areas”.

The project had two sub-objectives which have been considered here as primary and secondary objectives. The primary objective of the project was to “maintain the seasonal dispersal areas and migration corridor open to ensure the viability of the Nairobi National Park ecosystem and its biodiversity”. The secondary objective was to “enhance the economic security and quality of life of local landowner households”.

### Outcomes/Output Indicators

As part of the implementation, the WCL project consisted of six (6) Outcomes and 11 Outputs implemented under three (3) Project Components; (1) Increasing land secured for conservation; (2) Institutional strengthening for implementation and dissemination/ replication of WCL program; and (3) Enhancing the long term sustainability of the WCL program and the NNP ecosystem. This evaluation assessed six (6) of the 11 Outputs, and conducted an analysis of the achievement of the WCL in respect to the secondary objective of enhancing the economic security and quality of life for local landowner households in Athi-Kaputie Plains. As summarized in Tables 1 and 2, all the six Outputs assessed were achieved, which contributed to the realization of the respective outcomes.

### Effects and Economic Contributions of the Program

There were four (4) main positive effects identified in terms of the contribution of the WCL to the economic security and quality of life of local landowner households. These are;

#### Provision of cash income and poverty reduction

Poverty in the AKP is very high, with an estimated 70% of the households living below the Kenyan poverty line. Cash income is therefore critical for these families that are mainly dependent on

Summary of Achievements of the WCL Project Outputs <b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Baseline</b>	<b>Project End (2012)</b>
<b>Project Component 1. Increasing conservation land through wildlife conservation leases</b>			
Area under contractual commitment for wildlife use (WCL signed between TWF and private landowners) expanded, and commitments strengthened through introduction of multi-year leases	Area voluntarily enrolled in Wildlife Conservation Leases increase to 60,000 acres, with at least 20% of the WCL being multi-year	10,000 acres (2008)	61,067 acres (2012) <b>Well Achieved</b>
Number of participating/ benefiting households increase to 400	148 (2008)		417 (2012) <b>Fully Achieved</b>
% of Kitengela rangeland within the 60,000 acre target area that is enclosed by fences does not increase over baseline*		Not assessed	
20% increase in number of lions (indicator species) regularly using Kitengela	18 individuals**		35 individuals (2012) <b>Fully Achieved</b>
<b>Project Component 2. Institutional strengthening and information dissemination</b>			
TWF develops capacity to administer expanded WCL program efficiently and to the satisfaction of program participants and funding sources; Increased awareness of and interest in WCL and similar approaches in East Africa	Wildlife leases are used strategically, based on research and monitoring, to maximize conservation benefits achieved with available funds		Not assessed
Stakeholders (local landowners, financiers) satisfied with effectiveness, transparency and responsiveness of management of scaled-up WCL program		Not assessed	
East Africa conservation practitioner community identifies at least 2 additional sites		Model tested in Maasai Mara and Amboseli	

**Table 1:** Summary of Achievements of the WCL Project Outputs.

<b>Project Component 3. Enhancing long term sustainability</b>			
Positive action on key land-related policy and institutional measures supporting maintenance of wildlife and habitat (joint objective with USAID KCP) Reduction of human/wildlife conflict in project area Increase in amount and reliability of funding for WCL during and beyond project		Land Use Master Plan (LUMP) implemented as the key planning framework for the project area (joint objective with USAID-funded project)	LUMP gazzeted by GoK and adopted by Kajiado County Council <b>Fully Achieved</b>
Kitengela Sheep & Goat Ranch permanently secured for wildlife habitat	Not assessed		
25% increase in households adopting Non-lethal measures for reducing wildlife predation on livestock. in the project area	Not assessed		
TWF develops and implements a professional fundraising strategy for WCL, and raises at least \$270,000 of additional funds (beyond baseline) for wildlife leases from non-GEF sources by end of project	TWF raised US \$270,000 by December 2011*** <b>Fully Achieved</b>		

**Table 2:** Summary of Achievements of the WCL Project Outputs.

livestock. The WCL disbursed a total of US\$ 837,120 (in US\$ 2005 equivalent) to a total of 417 households for the 12 year between 2000 and 2012. The average income to the participating households ranged from US\$ 248 in 2004 (7% of gross household income) in a period of normal rains to US\$ 345 per year in 2009 (25% of gross household income in a period of severe drought).

### Building human capital through education investments

More than three-quarters of the WLP income is spent on education (76% in 2008 and 80% in 2009), including payment of school fees, purchase of school uniforms, books. The WCL therefore enables pastoral families to invest in education of their children, and helps build the human capital that is critical for the future of the Maasai youth.

### Reducing pastoral vulnerability to drought

The WCL is invaluable in helping to reduce pastoral vulnerability to drought because it provides a regular and stable income that can serve as "safety-net" protecting families from the fluctuating livestock income during drought periods when pastoralists suffer drastic livestock losses. In addition, by helping to keep the rangelands in AKP open, the WCL benefits all pastoral families that are able to move with their livestock unhindered by fences in search of pasture and water during drought periods.

### Gender empowerment

The WCL has however contributed greatly towards the empowerment of women through the distribution of income allocated to women recipients. The percentage of women that were provided by the lease payments between 2000 and 2010 ranged from a low of 18% in 2002 to a high of 39% in 2000 and 2003 respectively. Some of these women include the most economically vulnerable and poor members such as widows.

### Current Challenges and Mitigation Measures

#### Socio-cultural challenges

When the project started, there were numerous challenges such as resistance from the local land owners who strongly believed this was a ploy by the Kenya Wildlife Service ([www.kws.co.ke](http://www.kws.co.ke)) [which had a very poor public image in the eyes of the community] to take over the community land for wildlife purposes as in the case of Nairobi National Park and others.

The program thus faced resistance in the first few years of its inception but eventually won the hearts of the people. Two land owners with 250 acres were the first to enroll and slowly other community members later joined after being convinced that no one is taking away

their land. For a period of seven years, the program had 123 members fully benefitting from the lease funds, contributing a total of 7,000 acres of open space available for wildlife and livestock grazing.

The lease program as it is though social in nature for purposes of attracting the socio-cultural concerns reserved in the community, it is also completely economic in nature since it focuses on lifting economic standards of pastoralists by creating conservation benefits and propelling incentives which trigger interests in participating and supporting wildlife conservation. During the payments, funds are released to the owners in an open forum attended by local leaders in form of ceremony where everybody gets to know how much the others are receiving for purposes of transparency and building social confidence. Payment forums are contacted three times a year, in January, May and September, every last Saturday before schools open on Monday. This is to ensure that farmers receive the money and use to pay school fees for their children.

There are several other challenges and opportunities for the WLC, some of which are highlighted in this evaluation. The key challenges include rapid urbanization, expanding road infrastructure which leads to increased fencing of land in AKP, high population growth rate, and rising land prices in the Athi-Kapiti Plains (AKP) or the Kitengela Area.

### Mitigation

After the conviction, the message spread fast through the wide community and many people submitted their application credentials usually comprising of copy of land title deed, copy of ID card, phone number among others. Not so long there were over 200 applicants on the waiting list. The program aims at promoting the co-existence between wildlife and livestock as well as reduces human-wildlife conflicts.

### Opportunities

There are also several opportunities, which include the development and adoption of the Land Use Master Plan (LUMP) which if implemented could help control unsustainable land uses in the area, the devolution of governance through the 2010 Constitution which now places Counties as the units of governance at the sub-national level and provides opportunity for greater participation of local land owners in the management of their resources, and the implementation of complementary Conservation interventions that includes the use of Conservation easements, livestock compensation schemes, community conservancies, and strengthened anti-poaching efforts.

Financing is one of the main challenges that faced the program since its inception in the year 2000. During the first seven years, the program was primarily funded through donor funding comprising the support of Friends of Nairobi National Park (FONNAP), The Wildlife Trust and African Wildlife Foundation. In 2008, The Nature Conservancy (TNC) offered a three year grant to support more enrolment in the program that saw more than 100 families and 5,000 more acres added to the list of benefitting families - Thanks to David Banks, the TNC CEO, and Kristen Patterson, the Programs Manager in charge of Africa. The total 12,000 acres is open land available for wildlife as well as livestock grazing whose owners directly receive cash money for being custodians of such wildlife. To receive lease money, a land parcel has to be open, unfenced, not subdivided, not mined nor sold with an apparently valid title deed bearing the correct name of the genuine owner.

In 2009 the world bank/GEF signed a three year contract [after seven years of application] to support the program and expand by scaling up through an elaborate plan comprising of multi-year leases - a leeway plan to transition the program into conservation easements - Thanks to;

AgiKiss, World Bank Lead Ecologist, Africa & Asia, Nathalie Johnson & Christian Peter - Senior Natural Resources Manager at the World Bank, who were our Task Team Leaders. Many thanks too to the GEF team - The GEF CEO Monique and the GEF East Africa desk in Nairobi.

So far up-to 417 families are currently participating bringing a total of 60,000 acres of open space available for conservation. An average of 3 children directly benefit including those who joined and left the program, up to 450 families have so far benefited and an average 1350 children have been schooled using lease money. The World Bank/GEF grants targeted 400 families and 60,000 acres in their program and so far have achieved about 95% of that goal.

Other outcome indicators include substantial increase in wildlife numbers, using indicator species (wildbeast, zebra) (Figure 3) and significant increase in the number of adult lions (Figure 4), which rose from the initial 18 to 45 in 2014. (*The killing of lions is illegal by Kenyan law; however, lions are sometimes killed by pastoralists in retaliation to livestock predation, especially because there is currently no legal provision and mechanism to compensation for the livestock losses caused by wildlife*) (Figure 5).



Figure 3: Plain Zebra.



Figure 4: Adult Lions.

The program also saw reduction in the fatal actions taken by Maasaimoran against lions as a result of predation (Figure 6).

Besides protecting land for wildlife and livestock grazing, the lease program also acts as incentive for land against sale, sub-divided mining or fencing. One will realize that the area - Kitengela and largely Kajiado County has one very attractive land from speculators and the sprauhting immigrants of urban Nairobi. Kitengela area is soon becoming a major suburb with land in Kitengela selling at an average Ksh 10 million per acre and about Ksh 15 million per acre in Ongata Rongai.

Over Ksh 200 million have so far been spent since inception of the program that pays Ksh 15 million per year. Statistics show that farmers who receive lease money are better off economically than those who sale livestock for a living. This is simply because the lease funds only leverage the average income per house hold.

With land use changes significantly the world over and competition for resources heightening, conservation space is getting lost, critically threatening the future of ecosystems and largely the existence of certain wildlife species, conservationists are forced to think of conservation options outside protected areas. Conservation leases, which are payment for ecosystem services and conservation easements, are considerable options practically for ecosystems worldwide facing similar critical conditions.

### Other Current and Future Challenges and Opportunities

As mentioned earlier, there are a number of challenges that make it difficult to ensure the long term ecological viability of Nairobi National

Park by maintaining open the seasonal dispersal areas and migration corridor on adjacent privately owned lands. At the same time, there are also opportunities that if capitalized on well, will go a long way in supporting the objectives of the WCL to ensure a sustainable future for pastoral families, their livestock and wildlife in the in Kitengela - Athi-Kaputie Plains.

### Challenges

Some of the current and future challenges include;

**Rapid urbanization:** the expansion of urbanization leads to conservation of rangelands to settlement areas as urban residents purchase land, further increasing land prices, leading to land sub-division, land sales and conversion of landuse to non-pastoral uses such as crop cultivation. The expansion of urbanization is expected to continue as Nairobi Metropolis expands into Kajiado as part of the implementation of the *Kenya Vision2030* economic blueprint (Government of Kenya, 2008) [6].

**Road infrastructure:** The fencing of land in AKP is directly associated with roads [3,7]. Therefore, a proposed plan to build a US\$ 200 million road bypass that crosses the southern section of the Nairobi National Park may hamper the land lease program and further accelerate the fragmentation of the landscape in Athi-Kaputie Plains.

**Population growth:** The population in the AKP and in the Kajiado County is growing rapidly and this creates more pressure on the AKP ecosystem, including increase in human-wildlife conflicts in the area.

**Rising land prices:** The high demand for land has raised the land prices in AKP. The land prices are particularly high near the Nairobi National Park (currently around \$10,700 per acre) and near the major roads, while far away from the tarmacked roads, land prices average merely about \$530 per acre (ACC, 2005) [8]. In parts of AKP land value has appreciated at over 11% per annum over the last 10 years, which compares well with the average ten-year returns from Treasury bills. The high land value and the rising land prices in the AKP reflects the peri-urban and urban potential of land where wildlife has no future, and not the agro-ecological potential of land, which allows for wildlife as a form of land use [9].

### Opportunities

Some of the oppotunities include;

**Land Use Master Plan (LUMP):** The Ministry of Lands, the local pastoral landowners and the Kajiado County Council have recently prepared a Land Use Master Plans (LUMP) for the Athi-Kaputie Plains (AKP), with the support of other organizations such as the International Livestock Research Institute and the Kenya Wildlife Services (KWS). The LUMP is Kenya's first ever land-use plan for a pastoral area that if implemented could help control unsustainable land uses in the area. The plan allows only land uses that are compatible with open livestock/wildlife grazing and sets a minimum parcel size of 60 acres in the open grazing lands. If enforced, this law should eliminate small sub-divisions of land to parcels that are not ecologically viable and prevent land uses that are incompatible with livestock and wildlife. The conservation of the remaining wildlife in the area will require that this new plan be implemented quickly and effectively.

**Devolution of governance through the 2010 Constitution:** The new constitution that was enacted in 2010 has devolved governance to sub-national County administrative units. This provides opportunity for greater participation of local land owners in managing their affairs and in greater say in the management of their resources. It can also

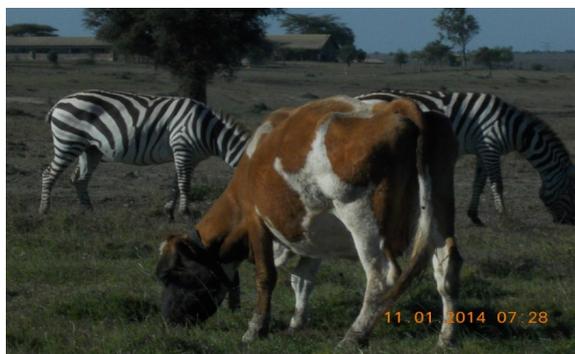


Figure 5: Livestock/wildlife co-existence.



Figure 6: Maasai Warriors, 2013.

open up opportunities to further seek for increased revenue sharing from Nairobi National Park through payments for habitat land used by wildlife and implementation of a surcharge to urban residents to pay for the land leases.

**Hybrid of conservation interventions:** The WCL cannot succeed in isolation. In that regard, there is need for development of a hybrid of conservation interventions with a package that includes the use of Conservation easements, livestock compensation schemes, community conservancies for ecotourism, and strengthened anti-poaching efforts. Sustainability of the program depends on the intervention of compatible program activities that generate income in form of holistic management of the project area.

### Lessons Learnt in the Wildlife Conservation Lease Implementation

In general, it is important that the pastoral communities living near to wildlife Protected Areas directly benefit from this close association for the betterment of both the people and the wildlife. Specifically, in the case of Nairobi National Park, it is especially important that its vital wildlife dispersal area be kept un-fenced, un-subdivided and open for both livestock and wildlife. The financial sustainability of the WCL, along with the companion Consolation Program, is essential to the future well-being of the wildlife of the NNP ecosystem and the pastoral people that share their land with the wildlife. Some of the lessons learnt include:

#### Rangeland management

The benefits of the open rangelands secured through the WCL PES initiative are critical for both wildlife and livestock because it ensures their mobility to access water and forage. The mobility of wildlife in AKP helps sustain the Nairobi National Park because wildlife can move freely between their dry season range inside the park and wet season range in the AKP.

Pastoral landowners are willing to keep open their rangelands within their individual privatized land parcels if they are provided with financial incentives under conditions that also allow grazing of their livestock herds.

#### Wildlife conservation

The WCL PES initiative serves a dual function. First, it is an incentive for conserving private land providing habitat for wildlife use. Second, it is a tool for mitigating human-wildlife conflicts especially carnivore predation of the pastoral livestock (Table 3).

The WCL is not sufficient on its own to ensure the viability of the Nairobi National Park (NNP) ecosystem, and it must be complemented with other tools, including conservation easements, predator compensation schemes, and land use regulations among other.

The WCL is particularly essential for the protection of the wildlife

Table 2. Funding for the WCL initiative from 2007-2012. PES Funding Institution		Amount (US\$)	Period
1	Kenya Wildlife Service	64,300	5 years (2007-2011)
2	The Global Environment Facility (GEF)/World Bank	792,000	5 years (2008-2012)
3	The Nature Conservancy (TNC)	150,000	3 years (2007-2010)

**Table 3:** Funding for the WCL initiative from 2007-2012. PES Funding Institution.

rich area nearest to the open southern border of the Nairobi National Park in Triangle I, and the wildebeest calving zones located in Triangle 11 of the AthiKapatie Plains (AKP).

#### Social and economic benefits

The WCL is a source of cash income diversification that is critical for pastoralists especially during drought periods when it helps buffer pastoral families from increased poverty.

The WCL has contributed to financial supporting the education of the Maasai youth helping build critical human capital for the future.

The WCL has also contributed towards gender empowerment of the Maasai women within families that are benefiting directly from the initiative.

#### Partnership and learning

Strong partnership is essential for the successful implementation of the WCL. The initiative benefited from the involvement and contribution of a range of local and international partners, including the Friends of Nairobi National Park (FoNNAP), the Kitengela Landowners Association (KILA), the Kenya government (through the Kenya Wildlife Service and the Ministry of Lands), the International Livestock Research Institute (ILRI), the African Wildlife Foundation (AWF) [10], The Nature Conservancy (TNC), the Global Environment Facility (GEF)/World Bank among others.

The WCL has informed and catalyzed the implementation of payments for environmental services (PES) based on the land lease for wildlife model in other pastoral areas in southern Kenya on lands that serve as dispersal areas for protected areas.

#### Target Wildlife Species in the Program

##### Mammals

- White (Grass) rhino
- Black (Browse) rhino
- Hippopotamus
- Masai giraffe
- Cape buffalo
- Lion
- Leopard
- Cheetah
- Serval cat
- African civet
- Clawless otter
- Zorilla
- African wildcat
- Spotted hyena
- Aardwolf
- Black backed jackal
- White tailed mongoose
- Black -tipped (Slender) mongoose

- Ichneumon (Egyptian mongoose)
- Aardvark (Antbear)
- Plains zebra
- Eland
- Bushbuck
- Wildebeest (Eastern white-bearded)
- Coke's hartebeest (kongoni)
- Impala
- Grant's gazelle
- Thomson's gazelle
- Bohor reedbuck
- Mountain reedbuck
- Suni
- Dikdik (Kirk's)
- Common duiker
- Red Forest duiker
- Oribi
- Waterbuck (Common)
- Olive baboon
- Vervet monkey
- Syke's monkey
- Greater galago
- Warthog
- Bushpig
- African Hare
- Spring Hare
- Striped Ground squirrel
- Bush squirrel
- Tree hyrax
- Bush hyrax
- Rock hyrax

#### Reptiles of note

- Africa Rock python (*Python sebae*)
- Serrated hinged terrapin
- Leopard tortoise
- Nile crocodile
- Nile monitor
- Black-necked spitting cobra
- Puff adder
- Rhombic night adder

#### Birds of Note (516 Species)

- Masai ostrich (densest wild population in Africa)
- Kori bustard
- Lappet faced vulture
- Ruppell's Griffon vulture
- White-backed vulture
- Crowned eagle
- Martial eagle

#### Acronyms

**AKE:** Athi-Kaputiei Ecosystem

**ASAL:** Arid and semi-arid lands

**AKP:** Athi-Kaputiei Plains

**AWF:** African Wildlife Foundation

**CCT:** Conditional Cash Transfers

**DRSRS:** Department of Resource Surveys and Remote Sensing (Kenya)

**EPZ:** Export Processing Zones

**GDP:** Gross Domestic Product

**GIS:** Geographical Information Systems

**GEF:** Global Environment Facility

**GoK:** Government of Kenya

**ILRI:** International Livestock Research Institute

**KWS:** Kenya Wildlife Services

**KCP:** Kitengela Conservation Project

**KILA:** Kitengela Land Owners Association

**LUMP:** Land Use Master Plan

**MCF:** Malignant Catarrhal Fever

**MSP:** Medium-sized Project

**NNP:** Nairobi National Park

**NGOs:** Non-Governmental Organizations

**NDVI:** Normalized Differential Vegetation Index

**PES:** Payments for Environmental Services

**TNC:** The Nature Conservancy

**TLU:** Tropical Livestock Units

**TWF:** The Wildlife Foundation

**USAID:** United States Agency for International Development

**WCL:** Wildlife Conservation Lease

#### References

1. Reid RS, Gichohi WH, Said MY, Nkedianye D, Ogutu JO, et al. (2008) Fragmentation of APeri-Urban Savanna, Athi-Kaputiei Plains, Kenya, Springer, Newyork.
2. Kimani K, Pickard J (1998) Recent trends and implications of group ranch sub-

- 
- division and fragmentation in Kajiado District, Kenya, *Geographical Journal* 164: 202-213.
3. Ogutu JO, Piepho HP, Owen-Smith N, Said MY, Reid RS, et al. (Submitted) Large herbivore dynamics in relation to climate and land use changes in Athi-Kaputie ecosystem of Kenya.
  4. Imbahale SS, Githaiga JM, Chira RM, Said MY (2008) Resource utilization by large migratory herbivores of the Athi-Kapiti ecosystem. *African Journal of Ecology* 46: 43-51.
  5. Gichohi WH (2003) Direct payments as a mechanism for conserving important wildlife corridor links between Nairobi National Park and its wider ecosystem: The Wildlife Conservation Lease Program. *Vth World Parks Congress: Sustainable Finance Stream*, Durban.
  6. Government of Kenya (2008) *Nairobi Metro 2030: A World Class African Metropolis*. Nairobi: Ministry of Nairobi Metropolitan Development (MNMD).
  7. Osano P, Said MY, Kifugo S, de Leeuw J, Ndiwa N, et al. (Submitted). Poverty, Inequality and Participation of Pastoralists in a Payment for Ecosystem Service Scheme Adjacent to a Semi-arid Protected Area in Southern Kenya.
  8. ACC (2005) *Will Kitengela die? (Fact Sheet 1)*: African Conservation Centre.
  9. Norton-Griffiths M Said YM (2009) *The Future for Wildlife on Kenya's Rangelands: An Economic Perspective*, Wiley-Blackwell, USA.
  10. AWF (2009) *Wildlife and Communities Gain New Lease on Land*.