



AFRICAN WILDLIFE FOUNDATION®



**SECURING FORESTED LAND THROUGH CARBON OFFSET
PROJECTS: PILOT PROJECTS FROM THE AFRICAN WILDLIFE
FOUNDATION IN EAST AFRICA**

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Executive Summary

The African Wildlife Foundation (AWF) is an international conservation organization working solely on the African continent. AWF's mission is to work together with the people of Africa to ensure that the wildlife and wild lands of Africa endure forever. AWF recognizes the complexity and severity of climate change in Africa and is focusing on increasing awareness and understanding of climate change, how various climate-induced changes will affect the landscapes, wildlife and people, and options for adaptation and mitigation measures. One of AWF's primary objectives is to protect and conserve strategic conservation land, this is also seen by AWF as a critical climate change mitigation measure. AWF uses a variety of conservation tools to secure land, such as conservation leases, land acquisition, zoning and land use planning. AWF is currently piloting the development of carbon easements as a new land conservation tool, wherein one uses the sale of carbon offsets to secure and fund land conservation in target areas wherein forest carbon presents a viable form of revenue. To date, AWF has been developing this tool in southern Kenya. AWF is working on a REDD (Reducing Emissions from Deforestation and forest Degradation) project in northern Tanzania. This project is a pilot REDD project that has been designed to inform the national REDD Readiness plan under preparation by the national REDD Task Force. One of the expected outputs is a legally binding benefit sharing scheme between the government and the local community for the sale of carbon and protection of the forest resources. Tanzania does not have easement legislation; however, the process of setting up the project is similar to that of an easement project and is therefore presented here as a case study along with the project in southern Kenya. AWF is also working on a REDD Project in the Democratic Republic of Congo. This project is not presented in this paper, but will benefit from the lessons learned of the projects highlighted herein.

AWF Background

The African Wildlife Foundation (AWF), founded in 1961, is an international non-governmental organization headquartered in Nairobi, Kenya. AWF, together with the people of Africa, works to ensure that the wildlife and wild lands of Africa will endure forever. AWF has an integrated large landscape-scale approach, demonstrated in its African Heartlands Program, which addresses threats to conservation, sustainable natural resource management and improving livelihoods. AWF's Program is currently operational in nine high-priority landscapes, known as *Heartlands*, across 15 countries in central, eastern, southern and west Africa.

Figure 1: African Wildlife Foundation Heartlands



In each Heartland, AWF implements its work through four main strategic areas: land and habitat conservation; conservation enterprise; capacity building; and applied science and research. Policy development and climate change are cross-cutting themes that are integrated into each of these programs. Through these programs AWF aims to facilitate practical, field-based solutions to global and local sustainable natural resource management challenges in Africa.

The International Panel on Climate Change recommends that a large landscape approach increases chances of mitigating and responding to climate variability and change.² AWF's Heartlands contain vast functioning ecosystems, including a sizeable area of the Congo Basin forest system, of great relevance to both containing and adapting to climate change. Six of the nine Heartlands are transboundary landscapes, and all are focused on delivering sustainable local solutions to the challenges of integrating sustainable resource management and adapting to climate change with the need for economic growth and sustainable livelihoods throughout Africa.

AWF and Land Conservation

The conservation of land and habitat has been a core interest to AWF for decades. Land conservation was incorporated as an explicit strategy of AWF in the late 1990s with the development of the African Heartlands Program. AWF has developed and uses a variety of conservation tools to protect strategic areas of public, private and communal land. These range from strengthening the management of Protected Areas and associated systems, land acquisition, land leverage through conservation-friendly commercial enterprise development, conservation leases easements, zoning and land use planning. While AWF has had success in conserving strategic lands, the rate of habitat fragmentation continues to escalate throughout Africa; therefore, there is a need for new and innovative conservation tools. AWF is piloting the use of carbon credit offsets and resultant financing to support the protection of land and improve community livelihood. This would be formalized through a carbon easement, as permitted by Kenya statute.

Climate Change in Africa

The planet is warming more rapidly than has ever been recorded before and climatic instability is increasing, particularly in terms of rainfall patterns. Historical records confirm recent climate change over most of Africa during the 20th century and in coming years warming over Africa is predicted to range from 0.2 °C per decade (low scenario) to more than 0.5 °C (high scenario)—significantly greater warming than the global mean predictions. These changes are expected to accelerate over the coming decades, though regional changes will vary greatly. (AWF Climate Change Strategy, 2007.)

While the African continent contributes the least to climate change through CO₂, it is believed to be most vulnerable to the consequences of climate change. This is due to its expansive aridity, the emphasis on natural resource-based development, high levels and prevalence of poverty, and the limited resources available to cope with impacts. (AWF Climate Change Strategy, 2007.)

Climate change is predicted to become the biggest single driver of terrestrial biodiversity loss over the next 50–100 years. Africa contains about a fifth of all known species of plants, mammals and birds in the world, and a sixth of known amphibians and reptiles. Temperature rises will result in climate volatility, including more frequent extreme conditions such as droughts and floods. This will result in altered hydrologic regimes and precipitation patterns; more rapid desertification; sea level

rise yielding increased coastal erosion and freshwater contamination by saltwater; and the disappearance of glaciers. The indirect impacts include: freshwater stress and scarcity; saline water movement inland; coral bleaching; increased food insecurity, insecurity because of competition of resources and an increase in cost of living; increased livelihoods vulnerability (especially for those dependent on agriculture); displacement of people because of flooding; and increased spread and prevalence of certain diseases. (AWF Climate Change Strategy, 2007.)

People across Africa will be severely affected by these impacts and the majority lacks the resources to adapt or cope. The predicted loss of species and biodiversity will impact key economic sectors including agriculture, fisheries and tourism. Pastoralism, practiced across two-fifths of Africa's land mass, will be hit particularly hard by desertification, periods of prolonged droughts interrupted by severe flooding and increased competition for resources. Some Southern African countries are projected to suffer reductions in agricultural yield up to 50% with small scale farms hit hardest. (AWF Climate Change Strategy, 2007.)

Forest Conservation as Mitigation

There is global consensus that much climate change relates to historic and current carbon emissions from fossil fuel consumption; however, an estimated 20% of emissions are due to deforestation, meaning that the management of natural systems, particularly forest systems, is a critical component of climate change responses. AWF firmly believes that better management and conservation of forest resources in Africa is an effective mechanism to help mitigate the impact of climate change and sequester carbon.

The role of natural ecosystems in the prevention and mitigation of climate change is being broadly recognized. There is strong anticipation of 'Reducing Emissions from Deforestation and forest Degradation' (REDD) being formally adopted and financed as a legitimate national level mitigation strategy within United Nations Framework Convention on Climate Change (UNFCCC). However, there are still hurdles to overcome in implementing REDD approaches, such as:

- a) the issue of 'leakage' e.g. deforestation shifting to other locations;
- b) compensating countries with good conservation records as opposed to current proposals which will channel most REDD funding to countries with high rates of recent deforestation;
- c) effective policy tools that enable national level REDD carbon targets and funding to be translated into local 'compensation' for carbon conservation;
- d) the development of a formal monitoring framework for carbon offset programs; and
- e) concerns that the growing focus on REDD may reduce pressure on northern countries to set and achieve ambitious carbon reduction targets at home.

The rapid development of official and voluntary carbon markets in Europe and the US has created a new framework for financing carbon emission reduction, with a growing interest in finding mechanisms that can finance projects in Africa. Some reliable certification programs are now in place for the voluntary carbon market, such as the Climate, Community and Biodiversity Project Design Standards (CCB), Voluntary Carbon Standard (VCS) and Plan Vivo (Figure 2.) While the CCB program does not certify the carbon, it evaluates climate, community and biodiversity impacts of land-based climate change mitigation projects. AWF aims to obtain VCS and CCB standards for each of its projects as it is committed to excellence in carbon offset programs, biodiversity

protection and community benefit. One of the main challenges is the high cost of certification, which is done through international private sector companies, which generally excludes small, local schemes.

In Kenya, approximately 2-3% of the landscape is forest (Kenya Forest Working Group). The need to protect existing forest and reforest other areas is critical for habitat conservation and water resources management, as well as carbon mitigation and sequestration. While Kenya's legislation provides a legal framework for protecting forest on communal and private land, the main limiting factor for forest conservation on community land in Kenya is the lack of funding. Where tourism is prevalent, communities often benefit from income and therefore maintain the natural resources that are the draw for visitors. Communities that live in remote areas that are not tourism destinations, lack the financial incentives to protect their forest. In such areas communities rely solely on the natural resources of the forest for their livelihoods and unless communities are provided with viable alternatives or financial incentives, they often will not protect the forests. The ability of these communities to access carbon markets provides a potential source of revenue for forest conservation.

The development of a voluntary carbon market is relatively new, and while there are several voluntary market carbon schemes and projects in development and operational, many of these are not certified. AWF has agreed internally that it will pursue certification for its programs as REDD+ to ensure that approved standards are applied and that any carbon being put out on the market can be verified and monitored according to set criteria. AWF has launched this work in two sites in Kenya, the Mbirikani Group Ranch in southern Kenya and the Mau forest in the Rift Valley in west/central Kenya. AWF's experience to date with the Mbirikani Group Ranch is described herein. AWF is working with communities to help them certify carbon offsets through the voluntary market, generate income to support the protection of community forest resources and generate income.

Figure 2: Voluntary Carbon Market Standards. (Kollmus, A. et al., 2008)

Main Supporters	Market Share	Additionality Tests (relative to CDM)	Third-party Verification Required	Separation of Verification and Approval Process	Registry	Project Types	Excludes Project Types with high chance of adverse impacts	Co-Benefits (relative to CDM)	Price of Offsets
Clean Development Mechanism									
UNFCCC Parties	large	=	yes	yes	yes	All minus REDD, new HFC, nuclear	no	=	€14–30
Authors' Comments:	The CDM is part of the Kyoto protocol and aims to create economic efficiency while also delivering development co-benefits for poorer nations. It has been successful in generating large numbers of offsets. Whether it also has delivered the promised development co-benefits is questionable.								
Gold Standard									
Environmental NGOs (e.g. WWF)	small but growing	=/+1	yes	yes	Planned	EE, RE only	yes	+	VERs: €10–20 CERs: up to €10 premium
Authors' Comments:	The GS aims to enhance the quality of carbon offsets and increase their co-benefits by improving and expanding on the CDM processes. ¹ For large scale projects the GS requirements are the same as for CDM. Yet unlike CDM, the GS also requires the CDM additionality tool also for small-scale projects.								
Voluntary Carbon Standard 2007 (VCS 2007)									
Carbon Market Actors (e.g. IETA)	new; likely to be large	= ²	yes	no	Planned	All minus new HFC	no	-	€5–15 ³
Authors' Comments:	The VCS aims to be a universal, base-quality standard with reduced administrative burden and costs. ² The VCS plans to develop performance based additionality tests. These tools have not yet been developed and are thus not included in this rating. ³ Prices are for projects implemented under VCS ver. 1.								
VER+									
Carbon Market Actors (e.g. TÜV SÜD)	small but growing	=	yes	no	yes	CDM minus large hydro	yes	-	€5–15
Authors' Comments:	VER+ offers a similar approach to CDM for project developers already familiar with CDM procedures for projects types that fall outside of the scope of CDM.								
Chicago Climate Exchange (CCX)									
CCX Members and Carbon Market Actors	large in the US	-	yes	yes	yes	All	no	-	€1.2–3.1 ⁴
Authors' Comments:	CCX was a pioneer in establishing a US carbon market. Its offset standard is part of its cap-and-trade programme. ⁴ Sales in USD: \$1.8-4.5 per metric tonne (October 07-February 08)								
Voluntary Offset Standard (VOS)									
Financial Industry and Carbon Market Actors	N/A	=	yes	no	Planned	CDM minus large hydro	yes	=	N/A
Authors' Comments:	VOS closely follows CDM requirements and aims to decrease risks for offset buyers in the voluntary market.								
Climate, Community and Biodiversity Standards (CCBS)									
Environmental NGOs (e.g. Nature Conservancy) and large corporations	large for LULUCF	=	yes ⁵	no	N/A	LULUCF	yes	+	€5–10
Authors' Comments:	The CCBS aims to support sustainable development and conserve biodiversity. ⁵ The CCBS is a Project Design Standard only and does not verify quantified emissions reductions.								
Plan Vivo									
Environmental and social NGOs	very small	=	no	no	yes ⁶	LULUCF	yes	+	€2.5–9.5
Authors' Comments:	Plan Vivo aims to provide sustainable rural livelihoods through carbon finance. ⁶ It verifies and sells ex-ante credits only. Third party verification is not required but recommended.								

Legal Tool

The legal mechanism AWF aims to use to secure the resident carbon in Kenya is a carbon easement, a legal agreement between AWF and the respective landowner that binds the landowner to protect the forest in exchange for benefits stemming from the sale of carbon offsets. Kenya's 1999 Environmental Management and Coordination Act (EMCA) includes a provision for environmental easements, Part IX of the Act, Sections 112 to 116. This section provides for the creation of environmental easements to facilitate the conservation and enhancement of the environment by imposing one or more obligations on land use. While EMCA has existed for over 10 years, because of the compulsory nature of this statute, this provision has not been implemented. However, advocates have argued that this language does not necessarily require an involuntary process. (Watson, et al. 2010)

Under S113, 'a person or a group of persons may make an application to the court for the grant of one or more environmental easements', the court imposing, 'such conditions on the grant ... as it considers to be best calculated to advance the object of an environmental easement.'

If a willing landowner wants to restrict their property for conservation and carbon sequestration, EMCA would permit the landowner to do so with an organization such as AWF holding the easement. As per section 113 in EMCA, the person or organization filing for the easement is the holder of the easement. While this would require a judiciary process, the fact that the landowner is voluntarily restricting their land would make the process less onerous. The only circumstance under which AWF would enter into such an agreement is if the landowner was voluntarily restricting their land. AWF supports the rights of community landowners and would not impose a conservation restriction on an unwilling landowner. Other draft statutes, such as the Draft Wildlife Bill (S51), include language on environmental easements, and would make environmental easements voluntary.

Section 116(1) of EMCA provides that any person with a legal interest in land on which an environmental easement is placed is entitled to compensation, "commensurate with the lost value of the use of the land." Thus, if an environmental easement is registered, a landowner is entitled to compensation. For carbon sequestration, a landowner is giving up the right to damage, destroy or degrade the forest. AWF would present to the court the carbon offset valuation as the proposed compensation value.

To qualify for the voluntary carbon market parties need to show longevity of a project. A one year project for example would not qualify. Therefore, to meet the voluntary carbon standards the agreement would be for approximately 15 years. The agreement would bind the landowner to conservation practices that would protect the forest resource, while ensuring the benefits from the carbon offset go back to the community, in support of their conservation efforts.

Tanzania's Environmental Management Act (EMA) of 2004, section 156, provides for the use of environmental easements for "facilitating the conservation and enhancement of the environment through the imposition of one or more obligations in respect of the use of that land." EMA provides for involuntary easements, but also provides an opportunity for easements to be voluntary. Section 157.-(1) states "Any person or a group of persons may make an application to the court for the grant of one or more environmental easements." Like Kenya, easements have not been used in Tanzania as a tool for conservation and need to be tested. Using an environmental easement in

Tanzania to secure carbon offsets and protect the forest from deforestation and degradation does seem to be feasible under EMA.

If environmental easements are not permitted by the court in Kenya or Tanzania, again, these models have yet to be tested, AWF will utilize other legal structures such as leases or contracts to secure carbon offsets, protect the forest resource and ensure returns to the community as owner.

Lessons from Rukinga, Kenya

The voluntary market is a new market that few in Africa have accessed successfully with certification. Rukinga Wildlife Sanctuary, 80,000 acres owned by Wildlife Works Ltd., a private company, completed Kenya's first carbon offset project. The term Sanctuary here does not mean formal protection. This land is privately owned and currently managed for conservation by the owners. Rukinga is located in southern Kenya between Tsavo East and West National Park. When Wildlife Works took ownership of the land in 1998, the property was overgrazed, intruded upon by poachers, and farmed and inhabited by squatters. Wildlife Works was successful in restoring the land, which now hosts a vast diversity of wildlife, as well as generating income to the local communities through enterprises, such as a T-shirt factory. Despite this positive work, the threat to the forest continued to be severe. The main threat was expansion of farmland and land conversion. In addition, this area of Kenya is riddled with charcoal makers; thus, Rukinga's trees were being poached by commercial charcoal-makers who service the markets in Mombasa.

The exact rate of deforestation was not quantified before the project started; however, at the time it was speculated that should the trend continue Rukinga would be barren in 20 years. Driven by the desire to stop the drivers of deforestation and take advantage of the emerging carbon markets, such as REDD and VCS, Rukinga was a pioneer in the carbon market area. Using local community members, Wildlife Works did a baseline for the property, determined rates and drivers of deforestation and the amount of carbon per hectare that would be saved should deforestation and degradation be halted. According to Rukinga shareholders Rob Dodson and Mike Korchinsky, they spent approximately \$400,000 over six months in 2009 measuring Rukinga's trees and getting their REDD application validated. This expense reflects the general high transaction costs and initial investment required to vet and verify the viability of a site for carbon storage and sale, as well as the fact that this was one of the first carbon offset projects and therefore, they were testing methodologies on the ground.

The project was certified by CCB, listed on their web-site under the Kasigau Corridor REDD Project. (www.climate-standards.org/projects/index.html) The carbon stored is approximately 7,143,785 tons GHG (CO₂). Wildlife Works was successful in selling their carbon on the voluntary market. According to Dodson, "We calculate that one third of the money [earned] from carbon will go to protect the forest. One third will be cash, like dividends for shareholders, and one sixth will go to the carbon broker. The rest is profit. About \$600,000 would go back into the environment every year to protect the trees. It would secure the jobs of the 150 people who already work on Rukinga and it could lead to 100 more jobs [phase 2]. We would need to employ tree patrols, administrators and others. The local shareholders who own 10% of the ranch would earn a lot of money. The wildlife would benefit from the habitat protection and it would cut climate change emissions."

AWF Carbon Offset Project Criteria

To assess pilot projects in its Heartlands, AWF established basic criteria for selecting voluntary carbon projects:

- **Willing landowner.** The landowner must be voluntarily engaging in the project.
- **Clear land tenure.** There must be clarity on ownership.
- **Free of claim/license/lease.** Pertaining to clear title, the land must be free of claims, leases, or other encumbrances, or if there is some sort of lease or claim, the encumbrance must be compatible with a carbon agreement and subservient to any carbon agreement.
- **15-30 years.** The landowner must be willing to enter an agreement for approximately 15-30 years.
- **Significant Threat.** There must be a clear threat to the forest of deforestation and/or degradation that can be documented.
- **Cost efficiency.** The cost of setting up a voluntary program is approximately \$150,000-\$200,000. The benefit must be far greater than the cost and enough of an incentive for the landowners.
- **Forest/Woodlands.** The property must be forest and/or woodlands. Currently there is no voluntary or regulatory market for grassland carbon.
- **Avoided deforestation.** The project must result in avoided deforestation and degradation.
- **Leakage.** The project must be able to address leakage, ie. the shifting of the threat from the focus area to another area.
- **Alternatives.** The project must provide sustainable alternatives to the drivers of deforestation.

Once an area is run through the above criteria, AWF's GIS team does an initial review to assess the rate of deforestation, project scope and scale, and vegetation type. This information helps determine whether a project should then be considered for a full feasibility study.

Based on the above criteria AWF selected pilot projects in consultation with the landowners, which in all cases thus far has meant communities and communally managed land areas, in its Heartlands. Because of the high cost of voluntary carbon projects, AWF hired a consultant to conduct rapid feasibility studies as an initial step and test on whether or not to pursue a given project. The rapid feasibility study includes information on:

- Current land use.
- Land use changes and drivers of change.
- Likely scenarios without project interventions. For example, if the project was not to take place, what would happen to the forest?
- Proposed project interventions and location.
- Determination of ownership of the carbon offset.
- Potential to generate income from carbon offsets.
- Appropriate market for carbon offsets—compliance or voluntary.
- Recommended mechanism for carbon offsets—VCS, CCB.
- Risks and sustainability, including additionality and leakage.

The feasibility studies enabled AWF to determine if a project is potentially viable from environmental and cost efficiency points of view. There have been a few areas AWF assessed with this methodology and found that it was not feasible for a carbon offset project because the amount of carbon stored per acre was minimal, the area was too small to qualify or the area did not meet voluntary standards. Had AWF done a full assessment, this would have resulted in a significant financial loss of limited conservation resources. AWF strongly recommends this initial step as a cost effective way to assess the feasibility of an area for a carbon offset project.

If the rapid feasibility study suggests a strong potential for a carbon project, and AWF is reasonably assured of community support based on preceding and concurrent consultations, the next steps include:

1. Full feasibility study and baseline carbon assessment (typically conducted by professional consultants/academics trained in this field) in compliance with chosen standard.
2. Verification and certification of carbon by a third party. Depending on the voluntary standard selected, there are auditors that are qualified to conduct the verification and certification.
3. Marketing and sale of carbon, and benefit sharing mechanism developed at the community level.
4. Development of household energy and alternative livelihoods activities to alleviate deforestation and degradation. (This step should be done simultaneously with the other project components.)

The full feasibility study includes:

- Detailed historical data assessment reviewing land use change and threat.
- Carbon baseline assessment to forecast carbon emissions based on projections of most likely future land use scenarios in the absence of project interventions. This service includes remote sensing and field work.
- Quantification of emission reductions and green house gas (GHG) removals by creation of carbon sinks and other project interventions based on actual interventions and selected carbon accounting methodology.
- Leakage assessment to define potential volumes of emissions, sources of leakage (displaced activities), location of leakage and risk of occurrence.
- Additionality tests (barrier analysis).
- Development and establishment of carbon monitoring systems (based on remote sensing and field measurements depending upon methodology selected).
- Launch of project design including a Project Idea Note (PIN) and Project Design Document (PDD).

The full feasibility study includes extensive field work in coordination with the landowner. Incorporating the community in this work is critical as it gives them ownership of the process as well as a full understanding of this complex program. Following the field work and the development of the PIN and PDD, the program can be presented to a voluntary carbon standard for review and certification, such as VCS or Plan Vivo and then to CCB for REDD+ certification. Once certified,

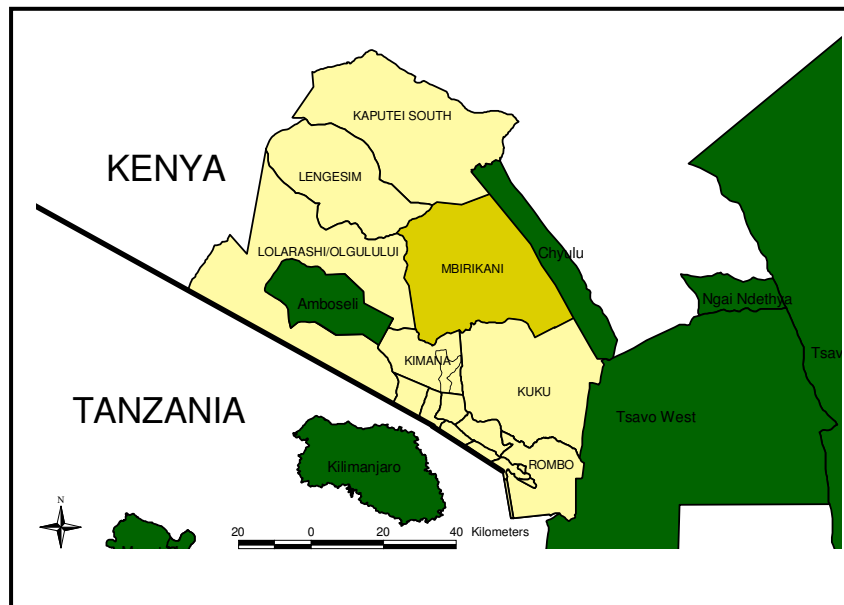
the project can then go to the market. This can be done through a broker or directly, pending access to carbon offset buyers.

Case Study I: Mbirikani Group Ranch

Mbirikani Group Ranch, located in southern Kenya, is approximately 1,300km² (320,000 acres), bordered on the eastern edge by the Chyulu Hills National Park, with the Tanzanian border just 50km to the south-west.

Mbirikani is owned and run communally by approximately 4,500 members of Ilkisingo Maasai. There are just over 10,000 people residing on Mbirikani, along with some 60-90,000 head of livestock. This estimate is before the 2010 drought, which resulted in a loss of approximately 80% livestock in arid regions of Kenya. (Western, 2010) The vegetation on Mbirikani ranges from upland grasslands to flat savannah grasslands to dense bush. Permanent water is scarce and restricted to a few swamps, the Kikaragot River along the southern boundary and a water pipeline, which runs south to north in the western quarter of the group ranch. Rainfall is erratic and averages between 350 and 500ml per year along an east-west gradient making it one of Kenya's driest areas. (MPT, 2007)

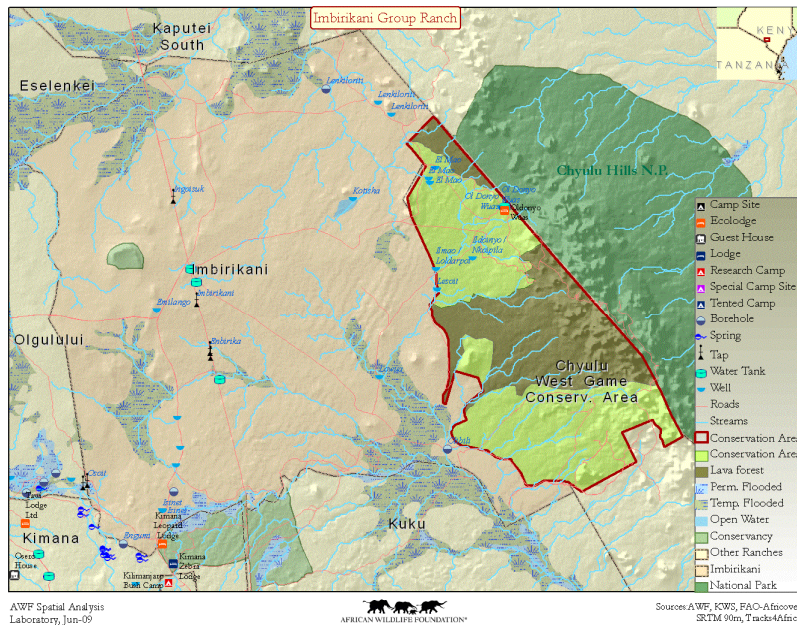
Figure 3: Mbirikani Group Ranch. Source: MPT.



Mbirikani Group Ranch lies between four major National Parks, Amboseli, Tsavo West, Chyulu Hills and Mt. Kilimanjaro. The Amboseli-Tsavo Ecosystem, of which Mbirikani is a key component, is one of the few places in East Africa where significant numbers of large mammals roam freely *outside* of protected areas. Mbirikani serves as a wet season dispersal area for wildlife from Amboseli and Tsavo and supports up to 30,000 head of wildlife. Key herbivore species include black rhino, elephant, buffalo, zebra, wildebeest, Coke's hartebeest (kongoni), eland, fringe-eared oryx, gerenuk, Maasai giraffe, impala and Grant's and Thomson's gazelles. Carnivores found in the area include lions, leopards, cheetahs, spotted hyena, striped hyena, black-backed jackals, side-striped jackals, bat-eared foxes, servals, civets and genets. (MPT, 2007)

AWF has been working with this group ranch for over a decade along with key partners such as the Maasailand Preservation Trust (MPT), a local organization based on the group ranch. The aim of AWF is to support Mbirikani in creating protected areas, generating income for livelihoods, and managing its natural resources sustainably. Overgrazing, lack of water resources, poorly-planned development, habitat fragmentation and the threat of sub-division pose the greatest threats to Mbirikani.

Figure 4: Mbirikani Group Ranch forest types.



For the past three years, the group ranch, MPT and AWF have explored the creation of a conservation areas abutting Chyulu Hills National Park to protect the forest and avoid deforestation. To support this proposed protected area, AWF suggested that the forested part of the area be supported through a carbon offset project; the rest of the land is savannah and savannah woodland, which currently does not qualify for carbon offset programs. AWF convened a meeting with community members and the Group Ranch committee, the elected management and governance body and AWF, to discuss the project proposal and share details on how a carbon offset project would work. AWF conducted a training session on climate change in Swahili and Kimaasai, the impacts on the landscape and livelihoods and an explanation of REDD. The participants had a fair understanding of the concept and approved it enthusiastically. They ended the meeting by stating “*Karibu Carbon*” (“Welcome Carbon”). The community clearly understood that money could be generated from the protection of their forest through “carbon.”

After receiving the endorsement of the community, AWF, through CAMCO, an international, private carbon consultancy firm with an office in Nairobi, conducted a more detailed feasibility study and developed the PIN for the project area. AWF, through CLOUT, a partnering NGO, in coordination with CAMCO assessed the drivers of deforestation and made recommendations for alternative livelihoods, including but not limited to development of woodlots, alternative energy sources, and alternative micro-enterprises, such as agriculture.

Deforestation and forest degradation on Mbirikani is driven primarily by harvesting poles for building materials, medicinal products and fires from honey harvesting attributable to local community members. Within the Group Ranch the most important underlying cause of deforestation is increasing population resulting in the construction of 100 new manyattas/bomas per/year. In addition there is deforestation for timber, sandalwood, carving, 'khat' (*Catha edulis*) and charcoal mostly by communities from outside Mbirikani. While Mbirikani has a policy against tree cutting on the group ranch without a permit, illegal tree harvesting is carried out mostly by organised groups from surrounding areas during the night. Timber is cut by these groups using chainsaws and hauled out by lorry. The Group Ranch lacks the capacity to monitor the entire area to prevent illegal harvesting. Where individuals are involved they are more likely to haul charcoal and timber products out manually, such as carvers who do rough conversion of logs on site to reduce load to be hauled out. (CAMCO, 2010)

A historical rate of deforestation analysis was done and it was determined that on average the rate of deforestation ranges between 2.5-5%. (Kenya Forest Working Group, 2010) To alleviate the deforestation pressure, alternatives and strategies are being employed, as per figure 5.

Critical to the project is the avoidance of leakage, the shifting of forest degradation from the project area to another area; therefore, no net reduction in forest degradation. In order to ensure the reduction of deforestation and forest degradation, alternative livelihood strategies are being implementing in Mbirikani as well as the surrounding areas.

Based on the initial analysis, CAMCO projected the potential income generation from carbon offset sales at a price of \$20/ton (Figure 6). It should be noted that the price of carbon is volatile, but if community and biodiversity benefits are documented clearly, the price/ton of CO₂ can increase significantly. It should also be noted that these figures do not represent the total project area. When AWF initiated this project, the Kenya DNA definition of forest was an area that has 30% tree crown cover with an average tree height of more than 2 metres. This definition has recently changed to 15% canopy cover; therefore, the project area has increased in size.

Figure 5: Drivers of deforestation for Mbirikani Group Ranch and proposed activities to prevent deforestation and degradation. (Clout, 2010)

Deforestation driver	Project activity					Primary location
	Forest management plan	Community policing	Reforestation	Other alternative livelihoods	Awareness raising	
Encroachment for agriculture		√		√	√	Project and reference forest areas
Harvesting poles for building manyattas (house)	√	√	√		√	Project forest areas
Harvesting poles for building bomas (cattle enclosure)	√	√	√		√	Project forest areas
Harvesting trees for medicinal products	√	√	√	√	√	Project and reference forest areas
Harvesting tree to make 'rungus' (walking sticks)	√	√	√	√	√	Project forest areas
Fires resulting from honey harvesting	√	√			√	Project and reference forest areas
Harvesting for carving						Project and reference forest areas
Harvesting for timber	√	√	√		√	Project and reference forest areas
Harvesting sandalwood	√	√	√		√	Project and reference forest areas
Harvesting 'khat'	√	√	√		√	Project and reference forest areas
Charcoal	√	√	√		√	Project and reference forest areas

Figure 6: Potential income for the sale of carbon offsets (t CO₂) at five year intervals over 40 year period from Mbirikani Group Ranch.

	Year 5	Year 10	Year 15	Year 20	Year 25	Year 30	Year 35	Year 40
Total	\$426,713	\$776,576	\$693,919	\$623,919	\$564,216	\$512,935	\$468,580	\$429,954

Based on the assessment and a clearer understanding of the project area, CAMCO recommended registration with CCB and VCS.

The ownership of the carbon rests with the Mbirikani Group Ranch, of which there are 4,500 members. One of the greatest challenges of any conservation scheme that includes income generation is the equitable distribution of income. Once the PDD, registration and sale of the carbon offset is completed, the income generated will go directly to the members of the Group Ranch. Traditional benefit sharing mechanisms have directed income to the elected committee, who are then charged with the task of distributing the benefits. In the past, benefits do not reach households and are often squandered by the committee; therefore, the community does not feel the impact of the program. To ensure the success of this program, AWF will distribute benefits to each household member so that the benefits can be felt directly. AWF hopes that by setting up this type of model, which mimics that of a company share, other conservation initiatives in Mbirikani will follow suit, thereby increasing the amount of income reaching individual members.

The next phase currently underway is a more detailed assessment of carbon, development of a PDD, certification, development, signing and registration of a carbon easement, and the sale of carbon offsets. AWF is cognizant of the fact that easements via EMCA have yet to be tested. Should registration not be feasible through the court, AWF will utilize other legal means available such as a conservation lease or contract to bind the conservation of the forest in exchange for the sale of carbon offsets.

Lessons Learned

Source of Deforestation

Once AWF and partners started assessing the forest and the drivers of deforestation, we realized that one of the major sources of deforestation originates from the eastern side of the Chyulu Mountains. This requires AWF to implement a number of conservation strategies on Mbirikani Group Ranch, as well as across the mountains in a different community. This has cost implications and will take much longer than anticipated; however, if we are unable to directly deal with the drivers of deforestation the project will not be viable.

Time Lag

When AWF initiated the project with a series of community meetings, the community enthusiastically endorsed the project. Carbon assessments take approximately 12 months from initial assessment to certification. During this period, the community is simply waiting and questioning the project and wondering why the time delay. AWF has had to consider different ways to engage the community so that the benefits start accruing and the community stays engaged. AWF has done so by:

1. Using community members to do the field work in the carbon assessments.
2. Keeping community members updated on activities through AWF, the Group Ranch committee and MPT.
3. Initiated alternative livelihood components simultaneously to the carbon assessment work.

Even with these initiatives, if the program is introduced highlighting the cash return to the community, these measures will likely not satisfy community members as they wait for the “money promised.”

It's Not All About the Money

There is a lot of discussion and excitement around carbon programs as a means of generating income. As noted from the projections of the carbon offset sales for Mbirikani and taking into account the cost of the project set up and maintenance, the amount of money generated is not massive. However, the potential revenue from carbon offsets combined with the other real benefits of the program result in a meaningful package of benefits for the communities. Therefore, AWF has been emphasizing the package of benefits, including:

- Job creation for the project development, implementation, administration and monitoring.
- Job creation for scouting and protection of forest areas.
- Income diversification through development of alternative livelihoods such as beekeeping.
- Preservation of existing natural habitat and income earning opportunities from conservation and tourism.
- Increased forest product availability through agroforestry and woodlots establishment at close range to the homestead/manyatta.
- Alternative energy products.
- Improved access to financial services.
- Improved water conservation

Project Area Size

When AWF initiated the project the estimated forest size was approximately 40,000 hectares. After more detailed field work and assessments, the project size decreased significantly because of more accurate assessments. This put the functional viability of the project at risk. As noted earlier, the cost of setting up a carbon offset project is significant. Therefore, a cost/benefit analysis must be considered in advance of any project. If the forest size is small and therefore benefits from carbon offset not significant, the project should not be pursued. Mid-way through the project, Kenya changed its forest definition from 30% canopy cover to 15% canopy cover so as to cover the dryland forests and the wooded savanna ecosystems, such as the ones found in Mbirikani. This meant that more forest area previously not included in the project could now be incorporated, which required additional field work and surveying.

Cost

The cost of carbon assessments and baselines is expensive. To date, on this project AWF has spent over \$100,000 to do the PIN, conduct drivers of deforestation survey, convene the community, staff time, data acquisition and GIS support. This is cost prohibitive for most communities and non-governmental organizations. It also means that organizations must have a fair level of certainty in the probability of a project before initiating it, which requires a level of expertise. In addition, as indicated in the project size section above, a cost benefit analysis must be completed to ensure adequate benefits for the level of investment.

GIS

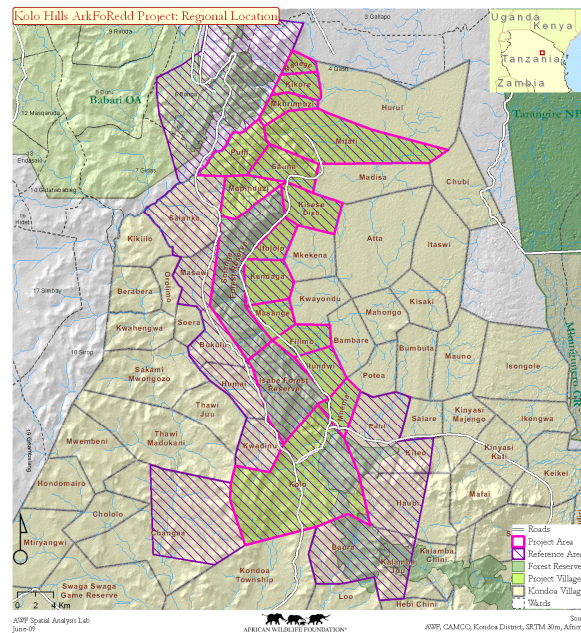
The amount of spatial analysis and GIS support and expertise was underestimated by AWF. To determine historical analysis and demarcate drivers of deforestation, GIS expertise is required along with relevant data, which in some cases needs to be purchased. AWF's GIS staff has dedicated significant time in the field and conducting desktop analysis. Once the full carbon assessment is complete, more GIS time will be required to enter the plot data.

Case Study: Kolo Forest, Tanzania

AWF is working on a pilot carbon offset project in the Kolo Hills Forests in Kondoa District of the Maasai Steppe in north-central Tanzania focused on contiguous community forest areas and government Forest Reserves, known collectively as Kolo Hills. This project is a pilot REDD+ project. The procedures for community engagement, quantifying carbon, determining drivers of deforestation and eventually marketing the carbon offsets are similar to the Mbirikani project described prior, which aims to access the voluntary carbon market. As explained further in the document, this project involves community and government land, as well as a Joint Forest Management agreement. Therefore, while environmental easements are permitted in Tanzania through EMA, AWF is assessing the most appropriate legal mechanism for securing the carbon offsets and forest protection given the complexity of land tenure and carbon ownership.

Kolo Hills forest is a critical watershed system that includes the headwaters of the Tarangire River, the dry season lifeline for wildlife and flora present in Tarangire National Park. Kolo Hills includes the eastern drainages of the Irangi Hills and the Irangi Escarpment, which in turn flow into the Irangi Plain, and three government Forest Reserves. The hills and escarpment, both inside and outside of the government forest reserves, are dominated by miombo (*Brachystegia spp.*) woodlands. The project focuses on the forest both inside and outside of the government reserves, as defined by the catchment basin of the Tarangire River, the main dry season water source for wildlife inside Tarangire National Park. Should the river flows decrease, impacts on downstream agriculture, aquatic and riparian habitat, and wildlife populations would likely be significant.

Figure 7: Kolo-Hills project location.



The ownership of the carbon in this project site is far more complicated than that of Mbirikani. Kolo-Hills covers mainly communal and forest reserve land. The total project area is 22,000 hectares, of which 10,114 hectares is inside Forest Reserves and 11,916 hectares on community or private land. The Forest Reserves are government lands falling under the jurisdiction of the Kondo District Council. Under the 2002 Forest Act, Councils are able to enter into joint management agreements. The carbon benefits resulting from forest protection and enhancement activities within the Forest Reserves currently belong to the Tanzanian Government. However, given the JFM agreement, the villages are entitled to some benefits. Agreement will be reached under JFM by MoU to ensure that sufficient carbon finance reaches the villages and individual community members who are ultimately responsible for the implementation of projects that result in generating carbon offsets. On the Village land the land holders have full carbon rights.

The primary objectives of the project are to:

- a) improve the current knowledge and scientific understanding of the forest by quantifying deforestation and current and prospective carbon impact and value;
- b) build village-level, local government and civil society organisational capacity towards understanding REDD in view of participating in the future, global forest carbon trading; and
- c) work to halt and reduce deforestation and forest degradation through ongoing sustainable joint forestry management (JFM).

Due to the absence of charismatic species for tourism attraction, communities in Kolo do not have the opportunity to develop wildlife tourism-based opportunities as an offset for the cost of conservation despite the vital function the forest plays in nourishing wildlife and tourism areas further downstream. The emergence of carbon markets, such as voluntary markets and REDD, as a vehicle to deliver benefits in return for sound forest management may help the communities living in and adjacent to the Kolo Hills Forest Reserves.

The Kolo Forest project was initiated in 2009 and has been set up to achieve the following objectives:

- Protect more than 22,000 hectares of forest from further deforestation and forest degradation.
- Prevent future green house gas (GHG) emissions from deforestation and forest degradation.
- Promote sustainable land use practices (agricultural, pastoral and use of forest products) in forest adjacent communities.
- Develop alternative livelihoods in forest adjacent communities.
- Increase and create new carbon sinks through the enhancement of existing forest areas and reforestation of deforested land.
- Build local and national capacity and understanding of REDD mechanisms.
- Increase scientific knowledge relating to the quantification of carbon benefits from REDD interventions.
- Develop systems to facilitate future replication and roll out to other locations.
- Sell carbon offsets to test use of carbon finance as a mechanism to enable the conservation of fragile forest ecosystems in such a way that local users and communities also derive benefit.

To achieve the above objectives, the simplified framework for the work plan involves the following main steps:

1. Conduct a baseline study, including a field based assessment, to estimate deforestation rates, carbon sequestration and emissions. Compile results and analysis of study, and assess the feasibility of engagement in an official or voluntary REDD market. Proceed with PIN, PDD and certification.
2. Build village-level, local government and organisational capacity towards understanding REDD. Conduct training programmes, including study tours, for community, local government partners on carbon, REDD and the potential integration of REDD into existing JFM.
3. Assess, address and mitigate the drivers of deforestation and forest degradation through improved and participatory forest management. Implement strategies in the JFM plans, which includes plans to create forest boundary markers by planting sisal plants, establish patrol teams to prevent and dissuade illegal actions in the forest, and conduct in-forestry surveys and mapping to establish usage and volumes of allowable take offs from the forest by the community and their payments value.
4. Work collaboratively with other projects to share learning about the application of REDD in JFM. Engage a broad range of stakeholders to learn from the experience of others in this rapidly changing domain, and to contribute its findings and field-based experience to Tanzania's National REDD strategy.
(Camco, 2010)

This project includes working with 21 villages, with a total population of approximately 60,000 that live in or adjacent to the forest. The forest consists of miombo woodland, bushland, short seasonal grasses and cultivated land. These remote communities rely on the exploitation of forest products for their livelihoods, which has resulted in a decreasing forest area, soil erosion and water run-off.

AWF is working with communities to develop alternative livelihood activities that will deliver socio-economic benefits while reducing current rates of deforestation and forest degradation.

The main drivers of deforestation were assessed and determined to be:

1. Shifting agriculture, crop cultivation for subsistence and cash is a major economic activity.
2. Overgrazing within the forest.
3. Firewood collection for domestic cooking, heating and brick making for buildings. Brick making requires the use of a lot of firewood.
4. Logging, this is done illegally for timber and poles.
5. Charcoal production.

A carbon assessment was completed and a PIN has been developed. The next steps include a more detailed carbon assessment, development of the PDD, acceleration of alternative livelihood programs, development of a monitoring program, carbon certification and market of the carbon offsets.

Lessons Learned

Leakage Area

After the baseline assessment was completed and assessments on drivers of deforestation done, it was realized that despite the already significant size of the project area, without the inclusion of an additional six villages, leakage would be a significant issue. Therefore, the project has had to expand to include these villages, which requires more funding, time, support and outreach.

Misperception

Despite intensive outreach to communities and various stakeholder meetings including participants at every level, ranging from government officials, to community members, there was miscommunication about REDD and what it means for the community. Communities were led to believe that they would lose access to the forest. As a result, the communities started cutting down as many trees as possible. In such remote and rural areas, it is extremely difficult to reach all community members to thoroughly describe, what appears to them as an esoteric concept of selling carbon, an invisible product. In addition, there is a long history in East Africa of false promises and removal of communities from natural resources for conservation; therefore, additional outreach, communication and community engagement is critical to the success of any program. In addition, as noted with Mbirikani, the development of meaningful alternative livelihood programs will enable community members to feel the true impact of the program.

Project Cost

The cost of the project, as referenced with Mbirikani, is expensive. In addition, the remoteness of the area has increased the cost because of travel costs, as well as the expansion of the project area to accommodate the leakage area.

Benefits from Alternative Livelihoods

The estimated income from carbon offsets, at \$20/ t CO₂, in the first five years is approximately \$950,000, 10 years is \$1.6M, and 15 years is \$1.3M. When the cost of the project as well as the high

number of beneficiaries (community members) as well as Government off take is considered, the benefits generated from carbon offsets alone are small. As referenced with Mbirikani, focus should not be on the cash benefits alone, but the entire benefit package.

Conclusion

Carbon and carbon-based REDD financing schemes offers potential means of creating and delivering new incentives and mechanisms for sustainable land and forest management across Africa, in turn, helping to mediate the impact of climate change in Africa. In particular REDD will help support the protection of forest areas that are unable to benefit from tourism income as a means of achieving benefits for conservation actions. The voluntary carbon market provides an opportunity for REDD readiness as well as the generation of benefits to landowners for forest and carbon conservation. Kenya's Environmental Management and Coordination Act provides a legal mechanism by which landowners can bind their land for carbon sequestration through an environmental easement—a carbon easement. In Tanzania EMA provides for the use of environmental easements; however, like Kenya, these have not been tested. Should the courts in either country not enable the use of environmental easements, AWF will utilize other legal mechanisms to protect the forest resource, secure carbon offsets and ensure legal benefits to communities for a particular period of time. While few projects have been successfully certified in East Africa by a third party because of the newness of the voluntary carbon market, Kenya can learn from Rukinga, a successfully certified program. AWF and others can also learn from AWF's initial phases in the pilot projects so that voluntary carbon projects can become more efficient in their development. In addition, the screening mechanisms put in place by AWF can help others determine whether a project has the potential and merits the investment of a full carbon assessment. Using these early screening tools will increase efficiency and save on cost. AWF aims to utilize its experience with forest based carbon projects and easements with other types of carbon easement projects, such as grasslands, as they become available.

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