The Kasigau Corridor REDD Project

Phase I - Rukinga Sanctuary

3RD MONITORING REPORT (M_3)

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Wildlife Works

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1 GENERAL

1.1 Summary Description of the Project (G3)

Provide a summary description of the project.

The Kasigau Corridor Phase I – Rukinga Sanctuary REDD Project *(hereby referred to as "the Project")* is estimated to avoid the emission of over 6 million metric tonnes of CO_2e that would have been emitted due to slash and burn deforestation over the 30-year project life. This project will achieve this emission reduction through a combination of dryland forest protection and extraordinary community sustainable development activities. This is an average of approximately 210,000 metric tonnes per year across the carbon pools of above and belowground biomass (forest carbon), and soil carbon.

The Project Area is home to a fantastic diversity of mammals (over 50 species of large mammal, more than 20 species of bats), birds (over 300 species) and important populations of IUCN Red List species such as Grevy's zebra (*Equus grevyi),* Cheetah (*Acinonyx jubatus),* Lion (*Panthera leo)* as well as over 500 African elephants (*Loxidonta africana)* seasonally.

The Project is clearly additional (under the project financial additionality tool) and the baseline, far from hypothetical, is an extension of actual deforestation that was occurring aggressively in the reference region adjacent to the Project Area at the time Wildlife Works came on the scene. This has also been clearly demonstrated from historic satellite image analysis.

Describe the project's major climate, community and biodiversity objectives (see G3.1).

The Kasigau Corridor REDD Project aims to leverage the financial support of the global carbon marketplace to:

- Prevent the *gross* CO_2e emission of approximately 7,600,000 tonnes over the 30-year crediting period of the Project by preventing any further deforestation of the Project Area and surrounding Project Zone.
- Add financial sustainability to the expansion of the world class conservation project that has been protecting biodiversity, avoiding deforestation on Rukinga Sanctuary and providing substantial community development benefits in the Project Area, so that we may continue through the project crediting period and hopefully well beyond to protect the area's magnificent biodiversity.
- Prevent the loss of spectacular biodiversity and protect the area as a wildlife corridor for important indigenous species such as African elephant (*Loxidonta africana*), Cheetah (*Acinonyx jubatus*), Grevy's zebra (*Equus grevyi*), African hunting dog (*Lycaon pictus*), Lion (*Panther leo*) and 50 other large mammal species both by direct protection of our Rangers within the Project Area and through our influence in the Project Zone.
- Expand the influence of Wildlife Works into the surrounding dryland forests within the Kasigau Corridor that are under similar threat to the Rukinga Sanctuary. These ranches are generally community owned, and not currently in a position to make the investments that Wildlife Works has made in biodiversity protection by co-venturing with those community landowners in Phase II of the Kasigau Corridor Project.
- Manage the protection of 30,168.66 ha of dryland forest in the Kasigau Corridor to maximize

biodiversity values, and provide substantial co-benefits to community members who in some cases have never received any financial income from their forested lands.

- Invest the proceeds of the carbon project back into alternative livelihood creation for people in the surrounding areas so that pressure on the forest is removed.
- Ensure long term community support for the conservation of the forests and wildlife through educational outreach in issues such as alternatives to slash and burn etc.
- Expand our organic greenhouse to implement community-based nurseries to provide agricultural and fuelwood growing alternatives that remove the need of the local people to deforest the land and surrounding areas.
- Identify, educate and implement community woodlots in the community lands with the aim of avoiding deforestation and enriching areas in the Project Area.
- Jojoba – initializing a campaign to introduce jojoba as a non-conflict cash crop into the existing largely agricultural communities.
- Implement education and awareness programs through existing and new women's groups, schools and other existing community forums such as Marungu Hills Environment Association.
- With increasing biodiversity, research, construct and market Kasigau Corridor ecotourism projects.
- Expand our innovative Eco-charcoal project to provide a viable cost effective substitute to firewood and lump wood based bush charcoal to meet the fuel consumption needs in the local communities surrounding the Kasigau Corridor REDD Project.

1.2 Project Location (G1 & G3)

Indicate the project location and geographic boundaries.

The Kasigau Corridor Phase I – Rukinga Sanctuary REDD Project is located in Southeastern Kenya, in Taita Taveta County, Coast Province. It is approximately 150 km northwest of the city of Mombasa. As part of the 2010 ratification of the Kenyan Constitution, counties were introduced as new geographical administrative units. These counties number the same as the old districts (47), but there are significant governance changes planned after the elections of 2013, including devolution to a new two-level governance system, which sees only national and county governments.

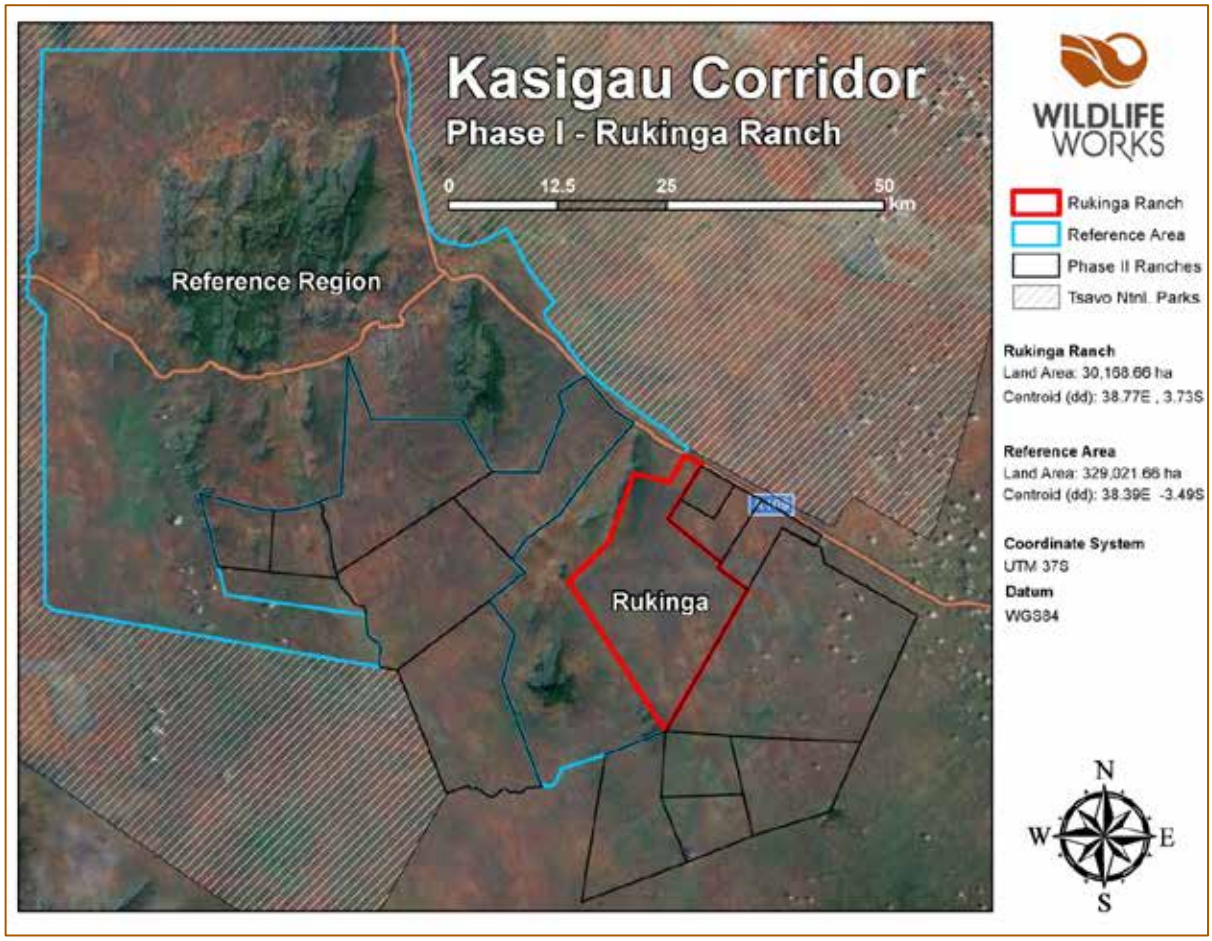
The Project Area covers all the land known as Rukinga Sanctuary, with a total of 30,168.66 ha (74,516 acres). The land was originally known as LR 12263, which had historically been reduced by subdivisions 12263/1 and 12263/2 at dates prior to the start date of this project.

Rukinga is part of that land that forms a corridor (the Kasigau Wildlife Corridor) between the Tsavo East National Park and the Tsavo West National Parks to the East of the Marungu range. The Project Area and Reference Area are clearly delineated in Figure 1 in the PD in section 5.1, and the shape files representing the boundaries have been made available to the project validator. The land within the project boundary has been tropical dryland forest[1] for at least 20 years and has been a primary forest throughout recorded history[2].

[1] UN IPCC, Good Practice Guidance for LULUCF, Table 3A.1.8;
[2] Earliest record that has been located is dated 1895 which identifies the area as forested [Hobley 1895 –

Describe the location of the project and basic physical parameters (e.g., soil, geology, climate), including specification of the project zone. Include a map identifying the project location and boundaries of the project area(s), the project zone and additional surrounding locations that are predicted to be impacted by project activities (see G1.1, G1.3 & G3.3).

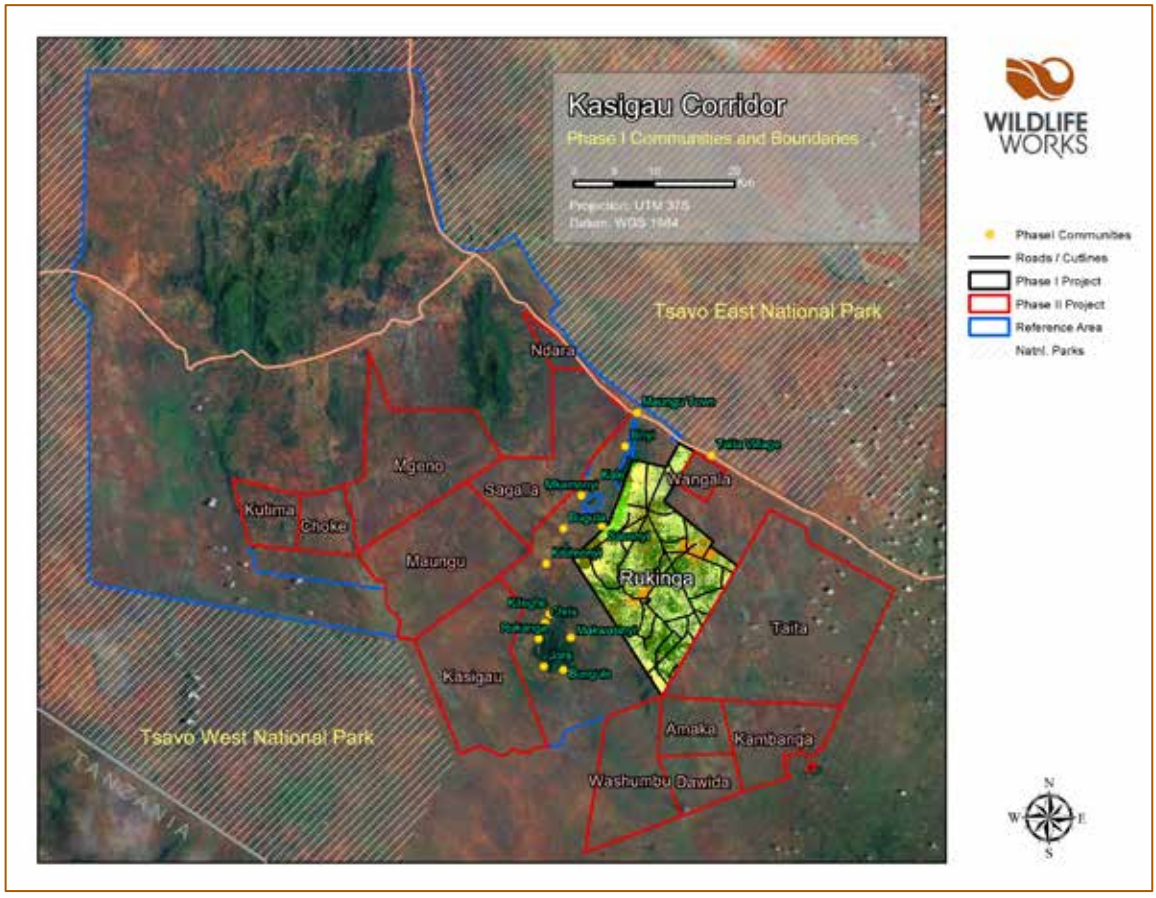
The Project is located in Southeastern Kenya; in the Coast Province about 2 hours drive from the port town of Mombasa along the Nairobi-Mombasa highway. The Project's Eco-Region is typified by a dryland forest ecosystem, dominated by acacia and commiphora drought-resistant species. The majority of people in the area descend from the Taita tribe, with significant populations of Duruma, Kamba and other less-prevalent tribes. More detailed information concerning the social, economic and geographic attributes of the Project Area can be found in the Project's CCB PDD.



The Kasigau Corridor Phase I - Rukinga Sancturay REDD Project and Reference Region Spatial Boundaries

The communities impacted by this Phase I Project will be those villages from Maungu south along the Kasigau up to the Northern population of Mt Kasigau.

Upon a Visit to Tsavo and the Taita Highlands – The Geographical Journal 1895 Vol 5 No 6 pp 545-561]



Communities within the scope of influence of the Phase I Project.

Climate

The climate in this region of Kenya is semi-arid, with average annual rainfall in the 300–450 mm range. There are no permanent water sources on the Project Area. Historically the rains occurred seasonally twice a year, in December and April. These are known as the grass rains and the long rains, respectively. However, over the past ten years the local climatic conditions have appeared to become more irregular, and there have been two periods of extended drought.

The Project is located at 3° South, and receives strong sunshine most days of the year. The coolest month is August, the hottest February.

Soils

The dominant soil type within the Project Area, and a common soil for this area of Kenya, is red laterite. This soil type characteristically contains high amounts of iron and aluminum. There are also small bands of black cotton soil occurring randomly within the Project Area, that account for a small amount of area, and is an insignificant contributor to the Project's soil carbon pool. There are areas within the project boundary where gneiss islands, rocky outcrops, penetrate the soil to form small rocky hills. These outcrops represent a small portion of the Project Area and were excised from the Project's soil carbon pool.

Geology

The Project Area is geologically dominated by the remnants of the Eastern Arc Mountains, which include the Taita Hills, Mt. Kasigau at the Centre of the Project Area, and lesser hills such as Sagalla, and the Marungu Range that runs North-South along the Western boundary of the Rukinga Sanctuary. These hills all fall within the Kasigau Corridor Project Area, and are home to remnant patches of montane cloud forest, and to several endemic bird and flora species.

1.3 Project Proponent (G4)

Provide contact information and roles/responsibilities for the project proponent(s).

The Project Proponent for the Kasigau Corridor REDD Project Phase I – Rukinga Sanctuary is Wildlife Works Inc., a California Corporation in good standing. Wildlife Works Inc. acquired the carbon rights from the landowner, Rukinga Ranching Company Ltd., after a process of Free Prior and Informed Consent (FPIC). The Carbon Rights Agreement/ Easement was approved by a full vote at a Rukinga shareholders AGM on February 13th, 2009. During this meeting, Managing Director and majority shareholder of the land, Mike Korchinsky gave an explanation of the potential of the carbon project. The decision was unanimously ratified at an extraordinary general meeting (EGM) on December 9th, 2009.

In the field the Project is managed by Wildlife Works Carbon LLC, a joint venture of Wildlife Works, Inc. and Colin Wiel Investments II. Wildlife Works Carbon LLC is then eligible for a share of any proceeds from the sale of the carbon credits generated by the Project. Details of this arrangement are specified in the Membership Agreement of Wildlife Works Carbon LLC, which was available to the project validators/verifiers.

Contacts

Wildlife Works Carbon LLC.: President – Mike Korchinsky
Tel: +1-415-332-8081
Fax: +1-415-332-8057
Email: mike@wildlifeworks.com

Where there are multiple project proponents, identify a single project proponent who is responsible for the project's design and implementation (see G4.1).

1.4 Other Entities Involved in the Project (G4)

Provide contact information and roles/responsibilities for any other entities involved in the development of the project.

Please see section 1.3 above.

Describe key technical skills that have been deployed to implement the project successfully and demonstrate that the implementing team's human and financial resources have been adequate to implement the project (see G4.2).

Wildlife Works is managed by **Mike Korchinsky**, a serial entrepreneur, with significant large company management expertise. Mike is supported by Colin Wiel who is a successful entrepreneur in his own right and the founder of the San Francisco chapter of the Keiretsu Forum, a world class angel investor forum.

Key personnel in this project include:
Wildlife Works' CEO and Founder - **Mike Korchinsky**, who has been a large-scale owner of conservation lands in Africa and Canada for almost 15 years. Previous to founding Wildlife Works, he followed a very successful business career. Through this he gained experience in managing multi-million dollar projects all over the world, some of which had as many as 5,000 team members, and in which he was he was responsible for all profit and loss accounts. In addition he also has experience in being a member of the executive team of a U.S. public company.



Mike founded Wildlife Works in 1997. Since then it has come to be respected by many leading conservation groups in the world as a model for community-based conservation. Mike and his team on the ground in Kenya have successfully steered Rukinga Ranch through many challenges over the years, and succeeded in creating the vibrant biodiversity sanctuary that it is today. Mike has contributed extensively to the development of AFOLU carbon accounting methods and credit markets, and his achievements would run off of this page if listed in their entirety.

VP African Field Operations - **Rob Dodson**
Rob has more than 20 years of experience in managing various aspects of development and conservation projects in Africa. Including building schools, tourism resorts and production facilities, to managing over 100 staff and interfacing directly with hundreds of community members on a regular basis. He speaks Swahili fluently and has gained the respect of administration officials at all levels of local and regional government in Kenya. In fact, Rob is so well respected he was recently elected Chairman of the Board of the brand new Secondary School, the first of its kind in the community. For the last 8 years, Rob has been responsible directly for all aspects of land management of the 30,168.66 ha Rukinga Ranch, the entire Project Area, plus additional lands of over 2,000 ha that Wildlife Works manages for conservation for the lands owners. He has extensive knowledge of local and regional biodiversity, is an honorary warden with the Kenya Wildlife Service (KWS), has a great appreciation for the needs of local peoples, having lived among them in the small rural village of Maungu for over 10 years. Rob has the experience of managing ecotourism both within the Project Area, and prior to joining Wildlife Works, in the world famous Maasai Mara. He is a world class auto mechanic and a qualified and highly experienced microlight pilot, an invaluable skill for aerial survey and monitoring of the Project Area.



VP Carbon Development – **Jeremy T. Freund**

With over 18 years experience in the fields of satellite remote sensing, GIS and applied geography, Jeremy brings broad technical and managerial skills to the Wildlife Works Carbon management team. Possessing a B.S. in Aerospace Engineering from the University of Colorado at Boulder, Jeremy specialized in satellite image processing with several years' experience working for prime US government contractors. He went on to receive his Masters in Geography from the University of California, Santa Barbara, where he developed a crop monitoring/ famine early warning system for the country of Kenya. He has spent several years working in applied natural resource science with emphasis on GIS/remote sensing for ecosystem services monitoring and applied forestry / biometric applications. As the technical lead for Wildlife Work Carbon, Jeremy's primary responsibilities involve management of AFOLU carbon accounting for REDD projects and project validation / verification. Jeremy also oversees all information and data both at the company's corporate HQ in California and in Rukinga, Kenya. Jeremy manages the writing of all technical documents for Wildlife Works, including CCB PDDs, VCS PDs, feasibility reports and methodologies. His recent achievements include: successful validation/verification of the Kasigau Corridor REDD Projects Phase I and Phase II, validation of the VCS methodology VM0009, "Methodology for Avoided Deforestation", and the recent successful validation and verification of the first Congo Basin REDD+ project, The Lac Mai Ndombe REDD+ Project in the DRC.



Other key management roles to ensure successful continuation of all Project Activities include the following:

Company Accountant – **Paschal Mulonzya**



Paschal is a qualified accountant having received a Bachelor's and Masters Degree in Commerce, Accounting Option, from Rani Durgavati Vishwavidyalaya University in India. He has been working in Kenya as Chief Accountant for a number of firms prior to joining Wildlife Works in 2005. Paschal is a Kenyan citizen, from the Kamba tribe, resident at the Northwest of the Project Area. He is responsible for all bookkeeping and accounting task, including interfacing with the external auditors. It was not possible for us to find someone with his skill set in the local community.

Sewing Factory Manager – **Daniel Munyao**

Daniel is a Kenyan citizen, also from the Kamba tribe. He is an experienced sewing factory supervisor, having held positions at several large factories in Nairobi and Mombasa prior to joining Wildlife Works in October 2002. He began his career in 1982 as a machinist and worked his way up through the management



ranks. His wide experience of all aspects of apparel production, together with his personal attributes of being an excellent team player, a positive reinforcement style manager, and needing little or no supervision on a day to day basis. This makes him an invaluable resource for us in managing our sewing factory in the bush.

Community Relations and Human Resources Manager- **Lenjo Laurian**



Lenjo is of Taita origin from the immediate community and was one of our first employees. He was hired in January 2001 as a storekeeper and assistant to the previous site manager Alice Ndiga He was trained into the position he now holds. His skills include people management, cultural knowledge of local community norms, basic administration computer skills such as Word and Excel, excellent verbal and written communication skills with fluency in English, Swahili and Taita and excellent conflict resolution.

Director of Biodiversity and Social Monitoring – **Dr. Mwangi Githiru**



As Director of Biodiversity and Social Monitoring, Mwangi's main role is to formulate biodiversity and social monitoring plans, and lead research teams undertaking surveys and studies geared towards evaluating the impact of Wildlife Works' REDD+ programmes in Africa. He has a Ph.D from the University of Oxford, England, and has held a Post-doctoral position at the University of Antwerp, Belgium and a fellowship at Brown University, USA. Previous to his employment at Wildlife Works, he worked on the governmental level as the Deputy Director of Research in the Ministry of Higher Education, Science and Technology.

Greenhouse and Selling-point Manager – **Antony Mwachofi**

Mwachofi joined Wildlife Works in 2012. He is a Taita from Sagalla Hills and has a background in accounting. Previous to his role as Greenhouse Manager, Mwach Mwachofi worked at a tourist lodge close to Voi, where he was in charge of bookkeeping and accountancy. He has always had a passion for trees and is very knowledgeable of the local tree species. In his current role, he oversees operations in the greenhouse as well as the Wildlife Works Selling Point. Through his experience in data management, Mwachofi is a key figure in recording and documenting greenhouse activities.



Carbon Development Associate - **Simon Bird**

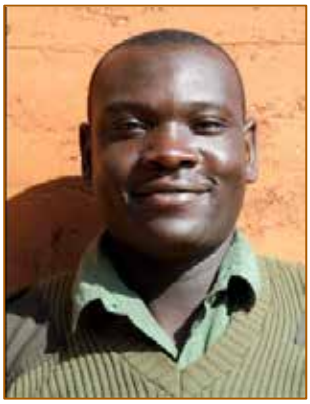


Simon has been working in the forest ecology and environmental conservation industry for over 10 years. Simon has a B.S. in Environmental Science and a M.S. in Soil Science from the University of Vermont. Simon works in the Carbon Technical Development department at Wildlife Works Carbon's San Francisco California office. There he assists with the development of REDD

projects, including the validation and verification process and the annual monitoring, reporting and verification for existing REDD projects. Simon's duties include overseeing biomass sampling methods and protocols, forest modeling, and technical writing and reporting to both the VCS and CCB standards. Simon has additionally participated in the revision process of VCS REDD methodology VM009.

Head Wildlife Ranger - **Eric Sagwe**

Eric grew up less than 1 mile from our project headquarters, and was originally hired as a young man with no formal training to be a wildlife ranger in the sanctuary. At that time the Head Ranger was Ekiru Mirimuk from a different region of Kenya, who had been brought in at the start of our project because he had specific knowledge and experience with managing a ranger force in the Kenyan bush, to patrol and to perform anti-poaching and other activities. When Ekiru retired, Eric was promoted to Head Ranger. His skills include motivation and leadership by example, tracking, patrol design and supervision, wildlife recognition and bush awareness and conflict management.



Carbon Operations Manager – **Jamie Hendriksen**



Jamie is in charge of the new projects and developments that are needed to ensure that the Project is feasible for its 30-year life span. His duties include supporting Rob Dodson and to oversee the design, budget, construction and management of the expansion plans to all the new ranches within the Project Area. Jamie has had over 11 years experience in running high-end tourist lodges throughout Africa. He is skilled mechanically, trained in technical design, and completes jobs quickly and professionally. He is fluent in Swahili and has had great experience operating in Wildlife Sanctuaries, often in high-conflict areas. He is a skilled communicator, negotiator and team player.

Conservation Office Manager – **Cara Braund**



Since joining Wildlife Works in January 2012, Cara has been based at the Kenyan Headquarters where she is in charge of managing the office operations. One of her primary roles is communicating with the local landowners regarding the progress of the Kasigau Corridor REDD Project, including producing their quarterly revenue reports. Cara also assists the VP African Field Operations in various aspects of work, in which she serves as a primary or secondary point of contact for external stakeholders and project partners such as NGOs, private sector operators and government agencies. Cara also handles the logistics of national and international visitors to the Project.



Strategic REDD+ Policy Advisor - **Christina Ender**

Christina joined Wildlife Works as an intern in March 2012, and now works full time in the Kenya office. Her main role is to assist in the writing of documents, including feasibility studies, proposals and PDs. As the Strategic REDD+ Policy Advisor, she also closely follows new developments on the REDD policy front and disseminates this information to the relevant people in the African operations sphere. Christina is in charge of the production of the periodic Kasigau Corridor community newsletter. She also provides support to management, including writing applications and creating PowerPoint presentations.

1.5 Project Start Date (G3)

Indicate the project start date, specifying the day, month and year.

The Project Start Date is January 1st, 2005. This monitoring period (m_3) is the third monitoring period and started on January 1st, 2012 and ended on December 31st, 2012.

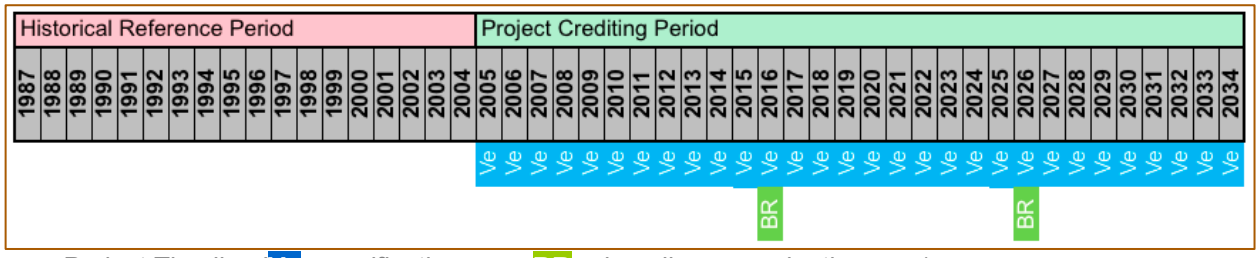
1.6 Project Crediting Period (G3)

Indicate the project crediting period, specifying the day, month and year for the start and end dates and the total number of years.

The project crediting period started on January 1st, 2005 and will end on December 31st, 2034 (30 years).

Include the project lifetime and implementation schedule and explain any difference with the project crediting period (see G3.4).

The project length for The Kasigau Corridor Phase I - Rukinga Sanctuary is 30 years, and will end on December 31, 2034.



Project Timeline (Ve = verification year, BR = baseline re-evaluation year)

Wildlife Works will monitor and plans to verify the Project every year, producing accurate and credible documentation for all VCS required project accounting. Per VCS minimum requirements, a baseline revision will be performed once every 10 years, on January 1, 2016 and January 1, 2026. If the VCS standard regarding baseline revision periodicity changes in the future, Wildlife Works will commit to performing baseline revisions whenever specified by the VCSA. The implementation schedule described above is in conformance with the project crediting period.

2 IMPLEMENTATION OF DESIGN

Describe the implementation status of the project's climate, community and biodiversity activity(s).

The Kasigau Corridor REDD Project Phase I – Rukinga Sanctuary has fully implemented its climate, community and biodiversity activities as described in the PDD and project monitoring plan. As carbon funding is realized throughout the Project's lifetime, Wildlife Works will continue to implement new and innovative activities as are deemed appropriate by the communities and the project stakeholders. These activities will be documented in future versions of this document.

2.1 Sectoral Scope and Project Type

Indicate the sectoral scope(s) applicable to the project, the AFOLU project category and activity type (if applicable) and whether the project is a grouped project.

The Kasigau Corridor REDD Project Phase I – Rukinga Sanctuary project falls under VCS sectoral scope 14: Agriculture, Forestry and Other Land Uses, under project activities Reduced Emissions from Deforestation and Degradation (REDD), and most specifically, Avoiding unplanned mosaic deforestation and degradation (AUMDD). This project falls into this category by the definition provided in the VCS Program Update of May 24th 2010, by virtue of the fact that more than 25% of the Project Area boundary is within 50m of land that was anthropogenically deforested in the ten years prior to the Project start date, as illustrated in the PD Template 'Kasigau Corridor Phase I VCS Template PD'. This project is not a grouped project.

2.2 Description of the Project Activity (G3)

Describe the project activity or activities (including the technologies or measures employed) and how it/they have achieved net GHG emission reductions or removals during this verification period.

Provide information regarding the operation of the project activity(s) during this verification period, including any information on events that may impact the GHG emission reductions or removals, the expected community or biodiversity outcomes, and monitoring.

All Project Activities described in the PD are underway during this monitoring period. The following is a list of Project Activities for Phase I (in most cases, the activities for Phase I also apply to Phase II, but some activities for Phase I do not apply to Phase II). All projects are currently operational and were operational during this monitoring period:

Wildlife Works Carbon Trust

- ***NEW*** *Wildlife Works Carbon Trust: School Construction, Bursary Scheme, and Water projects.*
- ***NEW*** *Community Based Organizations: Sagalla Conservation and Development Forum (SCDF), Mwatate District Stakeholders' Forum (MDSF) and Mwachabo Development Forum (MDF), Marungu Hill Conservancy (MHC), Kasigau Development Trust (KDT)*
- *Financial Aid to Marungu Hill Conservancy Association and Ksaigau Development Forum*

Wildlife Works business activities

- ***NEW*** *EcoFactory expansion and print factory*
- *Wildlife Works / Tsavo Soap Factory*
- *Wildlife Works Greenhouses and selling point*
- ***NEW*** *Amiran Greenhouses*
- *Jojoba propagation*
- ~~*Mushroom Farms from Elephant Dung*~~
- *Reforestation of Mt. Kasigau and surrounding area*
- *Wildlife Works Eco-Charcoal Production Facility*
- *Ecotourism Projects*
- *Community Wildlife Scouts*
- *Project Product Sales and Marketing*

Conservation and project infrastructure

- *Forest and Biodiversity monitoring*
- *Security and Ranger patrols*
- *REDD Carbon Inventory Monitoring*
- *Group Ranch Office Renovations / Construction*

All project activities are described in full detail in the PD, section 6.1 Baseline Scenario. These project activities were designed to mitigate deforestation and human-wildlife conflict, and therefore *by default* serve to mitigate leakage and uphold project permanence.

Several other projects have commenced and are currently active during this monitoring period, but are new enough that we have not yet collected data on them. We will do so throughout the next monitoring period and report on indicators within the next Monitoring & Implementation Report. These projects are mainly community projects operating through the Wildlife Works Carbon Trust, which is described in more detail in section 2.2.1:

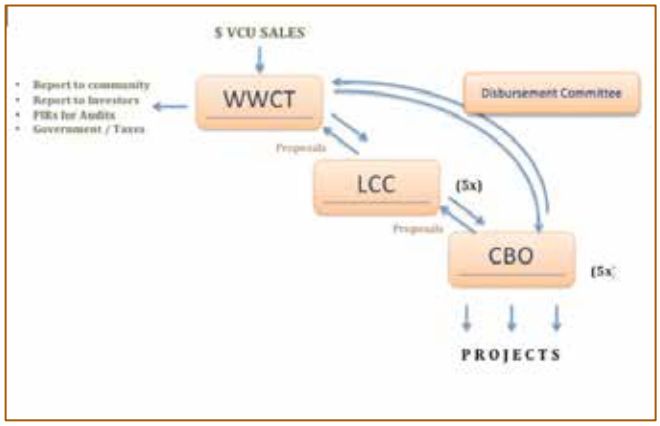
- JORA WATER TANK- Construction of a 100 cubic meter water storage tank and piping for the Jora community.
- SCHOOL FURNITURE UPDATE AT MOI HIGH SCHOOL- Fabrication of 50 steel chairs, 50 lockers and 50 bunk beds for Moi High School.
- MAKWASINYI WATER TANK- Construction of 25 cubic meter water storage tank for the Makwasinyi water tank.
- REHABILITATION OF NGANGU WATER PROJECT - Improvement/rehabilitation of a rainwater harvesting project. Construction of settling tanks to remove silt and debris from the water.
- CONSTRUCTION OF CLASSROOM AT MWATATE SECONDARY SCHOOL- An extension/expansion of existing classroom block, by adding a new building to accommodate secondary school pupils.
- WATER ROOF CATCHMENT AT MAILI KUMI PRIMARY- Installation of guttering and PVC water tanks for rainwater harvesting.

- OFFICE RUNNING COST FOR MWACHABO DEVELOPMENT FORUM- Initial purchase of office equipment, hardware and software as well as covering salaries for office staff and monthly rental of the office building.
- OFFICE RUNNING COST FOR SAGALLA CONSERVATION AND DEVELOPMENT FORUM-As above
- OFFICE RUNNING COST FOR MWATATE STAKEHOLDER FORUM - As above
- OFFICE RUNNING COST FOR KASIGAU DEVELOPMENT TRUST - As above
- OFFICE RUNNING COST MARUNGU HILL CONSERVANCY ASSOCIATION - As above
- SASENYI ROCK CATCHMENT- Restoration and expansion of a natural water catchment, to hold 630 cubic meters of water. This required clearing encroaching bush and scrub, and the extension of catchment walls.

Below is a description of each project activity, which have been operating during the current monitoring period.

2.2.1 Wildlife Works Carbon Trust

The Wildlife Works Carbon Trust works in conjunction with several Locational Carbon Committees (LCCs) and Community Based Organizations (CBOs) Projects are funded through the Wildlife Works Carbon Trust (WWCT), which manages distributions from the Kasigau Corridor REDD Projects. The Local Carbon Committees elected by community members decides where the funds are spent according to a proposal/award system. Funds flow directly to Community Based Organizations who oversee implementation of the projects approved by the WWCT. The LCCs, a group of independent, elected community members from varied backgrounds make decisions about proposed projects under this system to mitigate corruption and perverse incentive. The system is set up to ensure proper checks and balances. There are 5 locations that the LCCs and CBOs work from to ensure fair distribution of funds and specialized application of funds based on local needs. The diagram below displays this method of fund disbursement.



The method that Wildlife Works disburses revenue from project carbon credit sales to the communities.

We expect the list of community projects to grow over the lifetime of the carbon project as proceeds continue to flow.

2.2.2 School Construction and Bursary Scheme

After the successful distribution of bursaries to over 700 bright pupils, double orphans and vulnerable students in the first months of 2012, all Locational Carbon Committees took the decision to allocate between 40–50 % of the next year's income to bursaries. In September 2012, 26 students from the 5 project locations were chosen by the bursary committees to receive their first installment of tuition for universities, colleges and other further education institutions. As before, the bursary money has gone directly to the relevant institution to ensure transparency in the process.

During the monitoring period, the LCCs and Wildlife Works Carbon Trust approved five construction projects in schools. In Kasigau, Moi Secondary School received 50 beds, lockers and chairs fabricated in the region and in Mwachabo, the construction of a new classroom was completed at Mngama Primary School. In Mwatate, construction started on a new classroom at both Mwemba Primary School and Mwatate Secondary School. Additionally in Mwatate, construction is almost complete on a roof water-catchment at Maili Kumi Primary School.

2.2.3 Sagalla Conservation and Development Forum (SCDF), Mwatate District Stakeholders' Forum (MDSF) and Mwachabo Development Forum (MDF)

Three new Community Based Organizations (CBOs) were formed in the Project Zone this monitoring period (m_3). They are actively ramping up their capacity to manage carbon-funded projects under the tutelage of Wildlife Works. Their LCCs diverted funds from the first community income to equip and either build or refurbish their offices, with SCDF, MDSF and MDF receiving 750,000 Ksh, 833,000 Ksh and 669,000 Ksh respectively. The CBO staff have attended training days and workshops on subjects including the REDD process and financial management.

2.2.4 Financial Aid to Marungu Hill Conservancy Association

Wildlife Works has further increased its support of MHCA to 111,050 Ksh per month in order to cover salaries for a Project Coordinator, a Secretary, an Accounts Clerk, four Community Waste Technicians and eight Community Wildlife Scouts. There has been a sustained level of input in order to continue building capacity in the Community Based Organization, through workshops and training days.

2.2.5 Kasigau Development Trust (KDT)

Wildlife Works contributes 30,000 Ksh a month to cover salaries for five Community Wildlife Scouts. As with MHCA, there has been an increased level of input in order to build capacity in the Community Based Organization through training days and workshops. KDT has started administering water projects and construction projects in the Kasigau Location and has awarded further educational bursaries through the Wildlife Works Carbon Trust.

2.2.6 EcoFactory

Our core Consumer Powered Conservation[sm] project was the construction of the EcoFactory, just outside the Northeastern boundary of the Project Area, close to the main town in the reference region, Maungu. We employed over 150 people from the community in the construction phase. The EcoFactory grounds was then gazetted by the Kenyan Government as an Export Processing

Zone (EPZ) allowing for duty free export of products to Europe and the US.

The EcoFactory was built using rammed earth construction, an ancient technique that uses soil from the site as 95% of the wall material. The roofing material, Onduline, is made by a French company and uses recycled bitumen. The colors used for the roof and buildings are reds and greens in order to help the building blend with the natural setting. Inside the factory there are fluorescent lights spaced evenly throughout the building. The building also makes use of solar lighting via the skylights. The skylights are not glass but are instead made of a corrugated roofing material that allows light to pass through.

The climate here combined with the heat emitted from sewing machines and irons makes design intended to cool the building very important. Inside the factory there are ceiling fans spaced evenly throughout the building. The factory itself is also designed to take advantage of the wind and natural ventilation. There are windows every few feet around the building to take advantage of the breeze and cross ventilation. The roof overhang is designed to block the windows and the building from direct sunlight, thus helping to keep the temperature lower. Lastly, there is a second roof that is elevated from the first roof. The space between the roofs is screened in. This design feature allows for the heat to rise and escape. Furthermore, breeze can blow through the screens and help carry the hot air out of the building.

After construction, we then trained young women from the community to sew organic cotton clothing. The factory now creates garments under the Wildlife Works label made from only fully organic materials, and staffed by locally trained, employed and fairly paid members of the communities that border Rukinga. Creating employment for the initial 25 employees also provided a cash alternative to the unsustainable utilization of natural resources that threatens Rukinga today. The garments are mostly exported to the US and Europe for sale on the Internet and in fashion boutiques, although we do produce a small quantity for sale locally within Kenya, as allowed under our EPZ status.

In 2011, a partnership was made with the German sports lifestyle brand PUMA in which Wildlife Works is to produce and print some of the garments for the PUMA Wilderness and Sustainability Collection. As a result, an additional factory was built adjacent to the EcoFactory, which was financed by Phase I carbon revenues. A total of $150,000 was invested to complete this second production cell. The walls for this production cell had initially been built back when the first sewing cell was built, but it required roofing, flooring, and electrification. Additionally, a screen-printing unit was also constructed in which garments are printed. It is equipped with a manual printing-carousel, which uses water-based ink to print on natural materials.

As part of the production procedure for PUMA, we underwent a PumaSafe Audit. This was to ensure that the Wildlife Works EcoFactory met PUMA's standards for workers' rights, and health and safety. As part of this audit a first-aid room was built and equipped, as was a staff kitchen and canteen. By now, two first-aid courses have been taught to staff, training 40 EcoFactory workers, rangers and greenhouse staff in first aid.

The number of clients has also increased. In addition to the Wildlife Works collection, in 2012 the EcoFactory also produced garments for The Ministry of Tomorrow, Eden and SOKO. Through higher demand it was necessary to add capacity to the EcoFactory team. We therefore rehired ten women previously trained by Wildlife Works, which had been made redundant a few years ago due to lack of funding (staffing was down to 12 people prior to beginning the REDD project),

as well as employed and trained more men and women from the surrounding area. The number of full-time EcoFactory employees at the end of 2012 was 62, and four in screen-printing, giving a total of 66 factory workers.

In 2012, both of the factory building's roofs have been replaced by green *mabati*, as the previous material had disintegrated over time. Additionally, third factory was built in the EPZ by the separate company SOKO, adding to employment opportunities in the area.

We also improved our fabric store and inventory process, streamlining the production method. In September 2012, we an additional external audit to assess the standard and additional features needed to obtain the FairTrade trademark. We passed all of the required tests and the factory is now FairTrade certified!

2.2.7 Wildlife Works / Tsavo Soap Factory

We reported the soap factory as a Project Activity last monitoring period (m_2), but it was in a fledgling state, and we therefore had no indicator data. As of mid-2012, the soap factory is in the process of being moved into a newly built custom production facility, and has therefore been on a production hiatus (toward the end of 2012). Production is scheduled to start back shortly.

2.2.8 Organic Greenhouses

Wildlife Works is continuing its development of eco-friendly, water efficient income generating projects that can become an immediate solution for the Kasigau Corridor communities. Wildlife Works and Amiran Kenya have therefore agreed to collaborate in order to provide these communities with a reliable food source, and income generating business through the Farmer's Kit developed by Amiran for just these reasons. Working with local women's groups we have set up two greenhouses, one of which is completely organic, in order to test and potentially introduce these kits into our agricultural intensification program.

2.2.9 Jojoba Propagation and Extension into the Community

Wildlife Works is working in conjunction with a Ph.D student from the Sokoine University of Agriculture in Tanzania in order to characterize, propagate and manage the disused Jojoba plantation adjacent to Rukinga Ranch. The aim is to determine the genetic diversity of the shrubs and develop best practices for propagation and improved growth. The overall goal is to then distribute jojoba and work with the communities to build their capacity to propagate jojoba so as to improve the livelihoods of poor farmers in the communities.

2.2.10 Reforestation of Mt. Kasigau

During May 2012, our greenhouse team undertook the monitoring of trees planted in November 2011, locating 14,670 seedlings giving a survival rate of 58%. Due to a lack of good rainfall in 2012, we only had one tree-planting period, which took place in November and early December. During this time, 20,310 seedlings were planted with primary and secondary schools, community groups, government institutions and individuals.

2.2.11 Eco-Charcoal Production Facility

Based on the success of Wildlife Works Eco-Charcoal project during the last monitoring period (m_2), WWC decided to scale-up the efforts into a mechanized production system, including a production center at Mackinnon Road, just outside the southern edge of the Project Area. This decision was made in an effort to enhance and amplify the positive outcomes described in the original project documents as well as those observed from the test plots and pilot studies. Specifically, the expected outcomes are to enhance the role of alternative livelihood creation and the relief of pressure on local forest resources for providing fuel in the form of "bush charcoal". During the current monitoring period (m_3), and with the up-scaling, the eco-charcoal project has encountered some significant challenges. While the modus of collection of biomass will remain the same (i.e. harvesting the annual re-growth of hardwood shrubs and bushes and ensuring that regrowth is more significant than harvested biomass) the up-scaling has required that the project pass through a lengthy regulatory process, which has slowed production. Under the 2009 Charcoal Regulations, commercial charcoal production must be governed by a licensing agreement with the Kenya Forest Service (KFS). Additionally, the construction of a production center requires a full Environmental Impact Assessment Study Report, submitted to the National Environmental Management Authority (NEMA). The license to produce eco-charcoal from KFS is contingent on the results of the EIA Study Report and as of January 2013 NEMA have not yet released the results of the application allowing WWC to proceed with the construction. In the meantime, KFS remain tremendously supportive of the initiative and have expressed this in both written and verbal communiqués. WWC are confident that the successful resolution of this issue is forthcoming.

Concurrently, WWC continue to produce briquettes using the previous methods and maintain strong external institutional interest in the project. WWC believe that, with this continued interest, mainly by hotels and safari operators, that once WWC gain the regulatory licenses, the sustainability of the product will enhance the alternative livelihood creation in the area substantially while decreasing the pressure on unsustainable forest resource harvesting.

2.2.12 Ecotourism Projects

There are no major updates to the Ecotourism projects as of the current monitoring period. The Ecotourism project is focused on Camp Kenya, which is run by Camps International. This camp primary serves students from the United Kingdom on a gap year program. Individual tourists also stay at Camp Kenya. There are no direct Wildlife Works employees at Camp Kenya, but the camp is situated on Rukinga Sanctuary and pays dues for use.

The Eco Guide training program has ceased, due to the project partner pulling out operations. The program's goal was to train local community youth as Eco Guides for tourists.

2.2.13 Project Product Sales and Marketing

Wildlife Works has recently successfully negotiated the purchase of a roadside plot of land, where we will build a quality vending point for Kasigau Corridor products. This will provide a point of sale for quality crafts and art produced in the Project Area.

Meanwhile, through a small shop at Camp Tsavo on Rukinga Ranch and additional private sales, we have managed to increase the numbers of baskets sold from the Kasigau community.

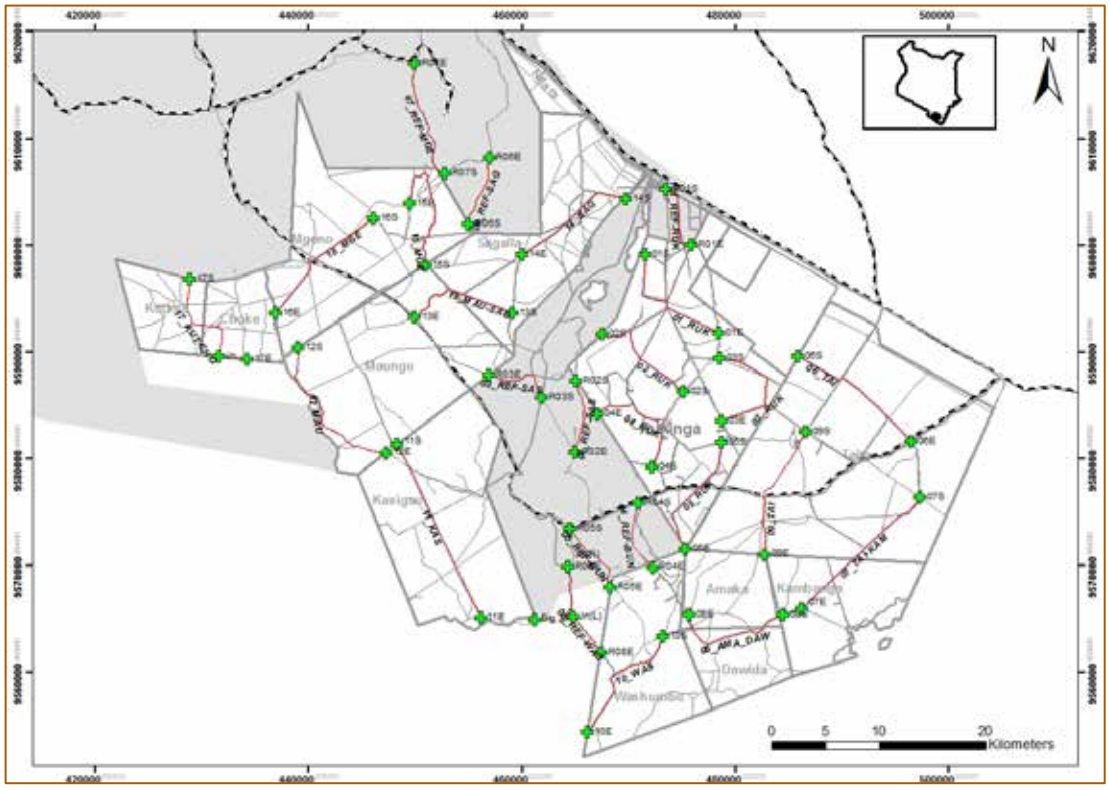
Working with a volunteer, quality baskets are encouraged in a variety of sizes to cater for different tastes and needs, and these are detailed with leather by a local craftsman.

2.2.14 Wildlife Works REDD Forest and Biodiversity Monitoring Plan

The following sub-sections describe any updates and/or new developments that have occurred in relation to Wildlife Works Biodiversity and Social Monitoring Program. All information in this section appears courtesy of Dr. Mwangi Githiru, Wildlife Works' Director of Biodiversity and Social Monitoring. For more detailed information, please refer to the official Biodiversity and Social Report.

2.2.14.1 Road transects

Twenty-five permanent transects ranging from 7-18 km were established in the Project Area to sample medium-sized to large mammals and bird birds: 5 in Phase I, 12 in Phase II and 8 in the Reference Areas (Figure below). Six sessions (every two months) of road transects were conducted in the one year between October 2011 and October 2012. A total of 82 species were counted along the transects during this time. Overall, the most common species encountered were Kirk's Dikdik (679 encounters), unstriped squirrel (352) and cattle (139); the 20 next species observed were a mix of mammals and various bird species (figure below).

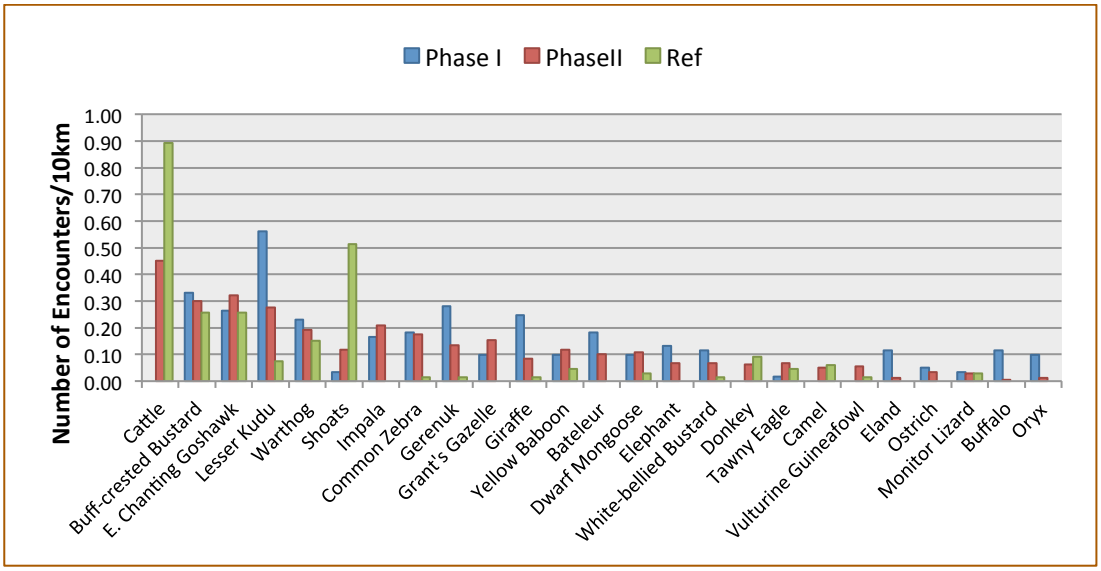


25 permanent road transects in the Kasigau Corridor Project Area including Phase I, II and the Reference Area

When broken down by the specific Project Area and corrected for transect lengths (total transect lengths were 60.5km in Phase I, 176.9km in Phase II, and 66.1km in the Reference Area), Kirk's

Dikdik and Unstriped squirrel were still commonest with a mean of 2.2 and 1.2 encounters per 10km of transect, respectively. There were two other notable patterns (Figure below): expectedly, livestock were commonest in the Ref and to some extent in Phase II but virtually absent in Phase I, while Phase I had a healthier mix of large and medium-sized mammals (e.g., elephants, giraffe, buffaloes, eland and kudu) than Phase II.

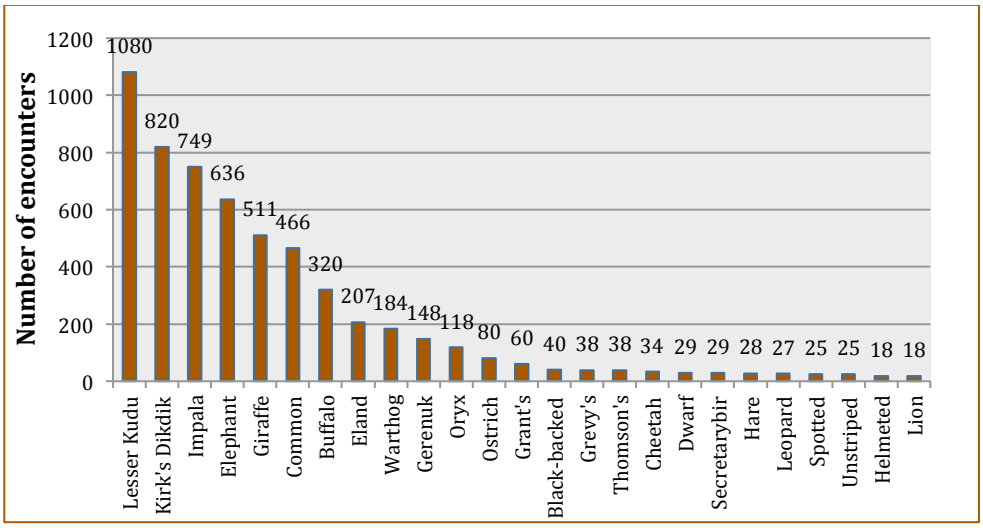
Finally, preliminary analysis of the elephant data, considering the numbers counted and the mean distances from the transect line, gave a density estimate of 1.6-2.4 individuals/km^2 in Rukinga, and 1.0-1.5 individuals/km^2 in Phase II, giving a total of 480-720 elephants in Rukinga and 1700-2550 individuals in Phase II. These figures will be refined when exact distances of observation are considered in the computations and the exact habitat types considered in the extrapolations.



Total number of encounters of the 25 commonest species (excluding the Dikdik and Squirrel) per 10 kilometers of transect in the three Project Areas: Phase I, II and Reference Area

2.2.14.2 Ranger and Community Scout Monitoring Transects

During the last year, our rangers recorded an impressive 5820 individual animals comprising 49 species across the entire Project Area in the course of their everyday operations. The top-five commonest species observed were: Lesser Kudu, Kirk's Dikdik, Impala, Elephant and Giraffe. Besides elephant, other species of conservation concern were observed regularly including Grevy's Zebra, Cheetah, Secretary bird Lion (figure below), while others were more rarely seen such as the African Wild Dog (spotted twice) and the more infrequently seen Striped Hyena (spotted three times). A refresher course for rangers is planned for 2013 in order to further improve their biodiversity data collection focusing on GPS and camera use and species ID amongst other issues.



Number of encounters for the top 25 most commonly seen species by ranger on patrol

2.2.14.3 Camera traps

As scientists, there is a limit to our capacity to observe and record wildlife activity. Remote photography is increasingly more widely used to sample wildlife populations especially for cryptic or shy species. Thus to add to the road transect monitoring efforts above, we have set up camera traps at 24 randomly selected sites on Rukinga Ranch. These are our 'eyes' in the field even in our absence; they enable us to observe and collect data on all animals passing near the camera, 24 hours a day, 7 days a week.

2.2.14.4 Community Monitoring

In 2012, we initiated a community wildlife monitoring scheme currently in seven areas across our Project Area: Zongowani; Talio Dip/Mazola; Kajire/Kishamba; Makwasinyi; Jora; Bungule; and Kale/Buguta/Mkamenyi/Birikani. In each of these areas, we have selected a community member who records all incidences of wildlife, especially focusing on the species of interest, either conservation-wise or human-wildlife conflict-wise.



In the long term, these data will inform Wildlife Works of the times when different animals appear in the community areas especially crop-raiding elephants and livestock predators in order to help planning of mitigation measures.

Some highlights in 2012 from these community monitors included several mentions of species 'interacting' with the community including: elephants, baboons, hyenas, lions, mongooses, buffalo, wild dogs and (an unconfirmed) leopard.

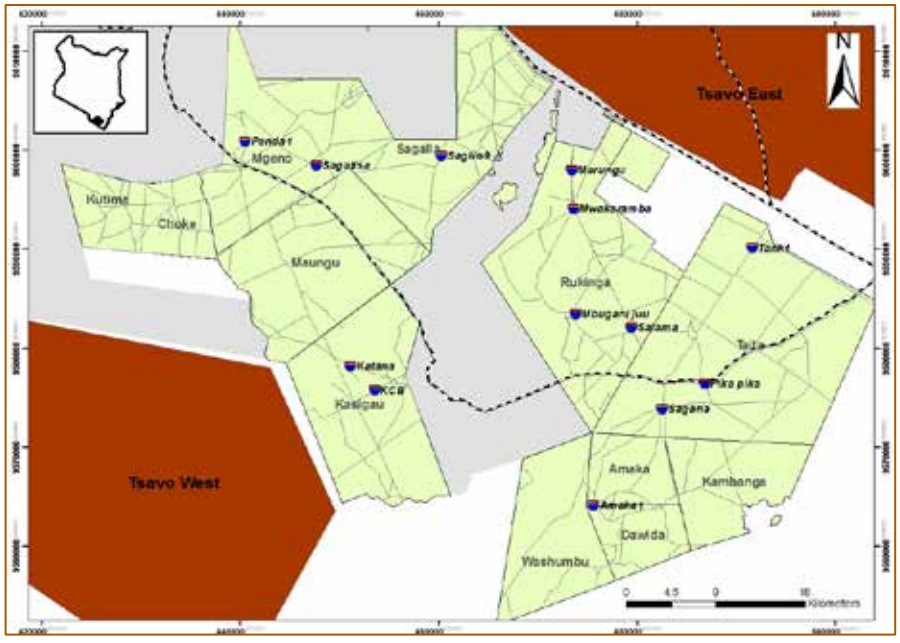
Commonest conflicts were crop raiding, chicken and goat predation, while cattle predation and destruction of property though mentioned, were more rare.

2.2.14.5 Habitat Monitoring

We have three habitat monitoring fronts, apart from the carbon monitoring. One key basis for this is to measure the impact of growing elephant populations on the vegetation, besides measuring other forms of disturbance and regeneration.

Carbon plots
From our permanent carbon plots, we have a database of more than 15,000 individual trees that we shall individually monitor over the project lifetime for various effects. In addition, number of saplings and seedlings are counted in smaller concentric plots within the permanent carbon plots to assess regeneration.

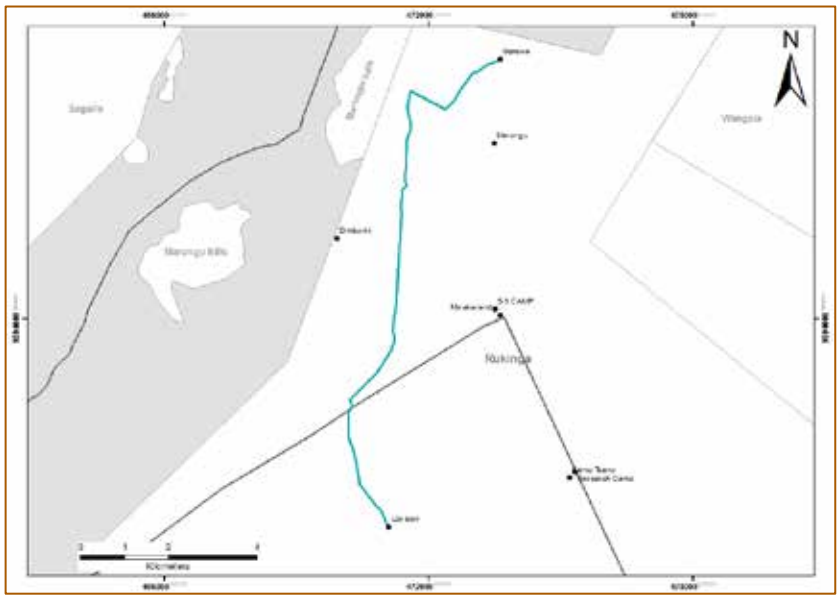
Waterhole transects – piosphere effects
We have selected 13 waterholes (some of which were recently re-scooped while others may be re-scooped at a later date; Fig. 9) from which we have set two permanent 1-km transects leading away from the waterhole in opposite directions. All trees 5m on either side of the transect line are assessed for elephant-related impacts to evaluate the impact of having water in the waterhole for longer periods (as is expected following re-scooping) has on vegetation. This research design will be refined in the coming year and monitoring conducted annually over the project lifetime, even if the selected waterholes fail to retain water.



Water holes from which two permanent 1-km transects have been set up to study piosphere effects of elephant feeding

Elephant feeding transect – Rukinga Ranch
Finally, we selected one 13 km transect running along the base of Marungu hills in Rukinga (figure below) which is an important dry season habitat for elephants being one of the last green areas due to the moisture from the hills. We set 55 30 m^2 plots every 250 m on alternative sides

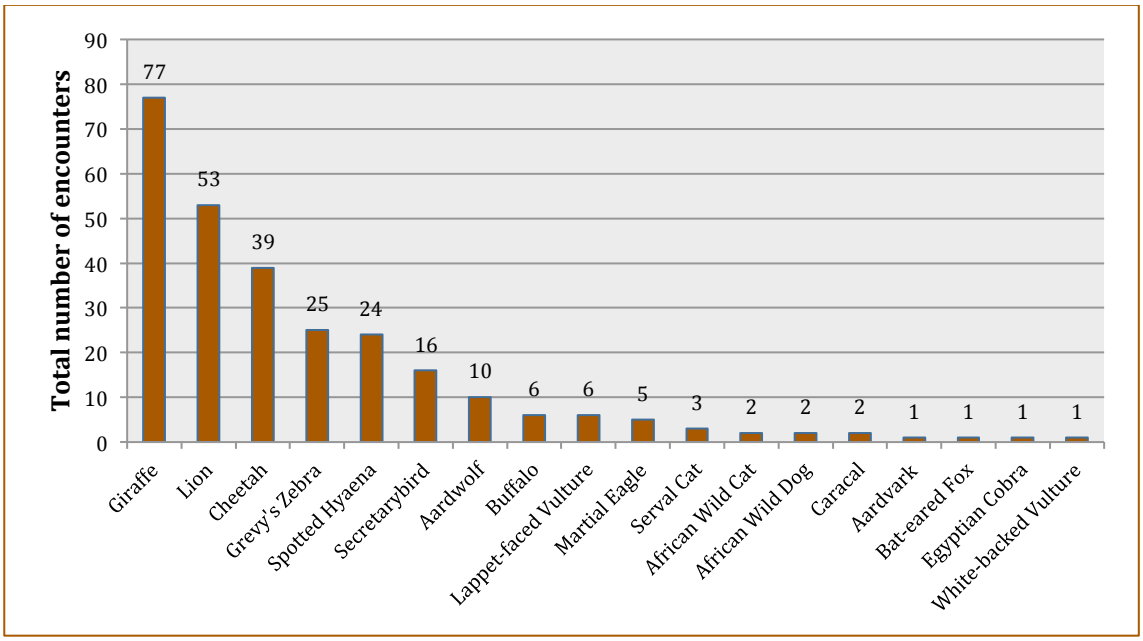
of the transect in which we assess impacts of recent elephant feeding on the vegetation (trees and shrubs) in the plot. This will be done twice a year – in the wet and dry seasons – both to assess the plant choices made by elephants and how the choices and intensity vary across seasons.



The 13-km transect running from Garawa Tank to Lokidori in Rukinga Ranch for monitoring elephant feeding patterns

2.2.14.6 Daily logs

A Daily Log system was constituted where different people going about their activities note down species of interest they encounter also noting their position using a GPS or on a prescribed grid system (for Rukinga Ranch). 579 species of interest were recorded across the Project Area, a vast majority of them (562) being in Rukinga. The Rukinga sightings were dominated by elephants (288, 51%); other commonly spotted species of conservation interest (HCVs) were lion, cheetah, Grevy's zebra and secretary bird, whilst others were less common such as the African wild dog, various vulture and raptor species (figure below). Also of interest was a Grevy's zebra sighting in Phase II (Washumbu Ranch), a first for this ranch. This will continue into 2013 with some refinement in the species of interest in order to focus mainly on the globally endangered species, and only a few other species.



Number of encounters of all species of interest recorded anecdotally in Rukinga Ranch

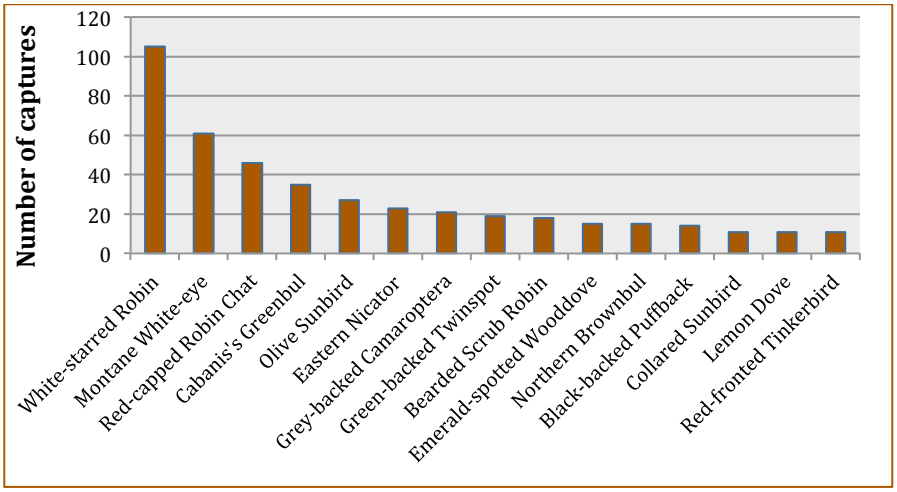
2.2.14.7 Mt. Kasigau Conservation Monitoring

Elevational bird ringing

Four mist net lines for bird capturing were set-up at different elevations at Mt. Kasigau (figure below): 850 m, 1100 m, 1,320 m, and 1,550 m. In 2012, 496 individual birds comprising 39 species were captured or re-captured in four ringing sessions conducted in January (151 comprising 23 species), April (88; 24 species), July (93; 25 species) and October (164; 20 species). Overall, the White-starred Robin was the commonest species captured (Fig. 12). Interesting species captured included the Taita sub-species of the Montane White-eye (until 2011 considered a separate species), and Palaearctic migrants (such as the Eurasian Cuckoo and Willow Warbler). Another one was the Striped Pipit, which is endemic to southeast Kenya and northeast Tanzania. Its range is described to be between 1,500 m and 2,000 m of elevation, therefore our capture could represent a confirmed altitudinal range extension, since it was captured at site II, which is at an elevation of 1,100 m.



Total number of individuals captured in Mt. Kasigau in 2012 across the 4 net-lines (shown are species with more than 10 total captures)



Total number of individuals captured in Mt. Kasigau in 2012 across the 4 net-lines (shown are species with more than 10 total captures)

Elevational vegetation monitoring

A total of 20 plots were set up from which vegetation measurements were taken from the base of the mountain to the top. They overlapped with the bird capturing sites (figure below) so that any concurrent changes in birds and vegetation characteristics can be captured and compared. Tree and shrub data were collected including species richness and diversity, as well as vegetation vertical diversity and canopy cover. Data analysis is underway; these vegetation data will be collected annually.

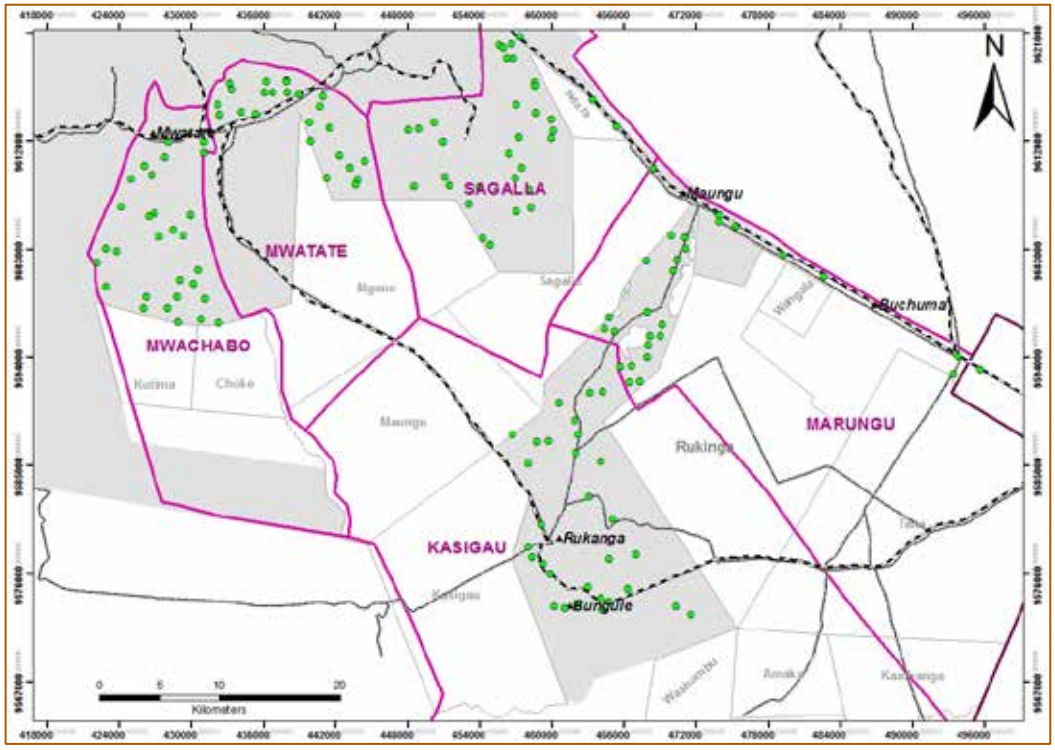
2.2.14.8 Social Monitoring

Household survey

The bulk of our social impact monitoring will take place via this household-level survey in 150 randomly selected households across the five Locations in the Project Area (see figure below). The first (baseline) survey was completed in April 2012 and will be repeated annually to assess progress with key indicators as the Project is implemented. While the complete household survey draft report is available for the auditors if desired, some key highlights included:

- Scope: Data were collected from about 60 villages across the five administrative Locations falling within the Kasigau Corridor REDD Project Area
- Basic household data: As expected, the majority (64%) of the 145 respondents were Taita, while the Duruma and Kamba made up 15% each. In about 80% of the households the man makes most key decisions. Number of persons per household varied from 1 to 18 with an overall mean of about 5±3; this did not vary much across locations
- Livelihood security and income: 87% of the households were subsistence farmers, with the majority of them (75%) not selling any of their on-farm produce. Most households (62%) did not obtain any livelihood-supporting products outside their farms, and for those that did, most off-farm sources (74%) were communal lands. A few households (15%) did not have any sources of cash income in the preceding 12 months
- Crop, Farm Animals, Soil, Land & Water Management: A vast majority (about 61-75%) said they had made no crop or animal changes on their farms over the past 10yrs; neither had they altered the ways they did their soil, land and water (SLW) management
- Food Security: Most households were food secure between May and September. About a quarter of the respondents suffered from food shortage year-round, whilst 25-30% did not have food shortage at any time of year
- Water use: household and agricultural: About a third of all households relied on rainwater harvesting, but sources of water for household use varied across locations. Less than 10% of households interviewed used additional water sources for agriculture apart from natural (rain-fed)
- Land: access and use: A majority (90%) of the households had access to some land for household use. Excluding 2 outliers, the overall mean farm size was 6.5±5acres, ranging from 0 to 30acres. About two-thirds of the respondents did not plant or protect any trees on their farms in the 12 months preceding the study; the commonest trees planted were: Mlezeni (13 mentions), Mkurumbutu (Melia volkensii), Mnago (Manilkara mochisia). Of those that received seedlings over the past year (about 27% of the respondents), most (46%) said they received them from Wildlife Works
- Weather and Markets Information: A vast majority of the respondents (83%) did not receive any weather or market-related information that they could use, e.g., drought and flood forecasts, rains start forecasts, daily or monthly weather and pest or diseases forecast
- Governance and association: Household participation in decision-making processes at the Village and/or Location levels was average, with 45% of respondents saying they were not involved in any committees dealing with education, water and other key issues; an overwhelming majority (83%) of the households were not members of any community groups.

- Climate crises: A majority (71%) of the respondents said they had experienced some form of climate-related crisis (e.g., flood, drought, fire) in the last five years
- Education & fees: Overall, 13% (of 247) students were not in school due to fees at primary level, 57% (of 37) at secondary level, and 71% (of 9) at tertiary level. Except for free primary education, fees are overwhelmingly footed by the households themselves; none of the households had received Wildlife Works-connected bursaries
- Infrastructure and Services: By the respondents own estimation, the mean distances the household members had to cover in order to access key services were: 2.9km to a primary school, 7.7km to a secondary school, 6.4km to a health facility, 3.4km to a shopping centre or market, and 4.3km to a permanent water point
- Income and Expenditure: In good (normal) years, almost half (45%) of the respondents said they earn between Ksh 1,500 and 5,000 per month, while another 32% make between Ksh 5,000–10,000. Crucially, in bad years, most drop to below the region's poverty line of about Ksh 1,500 (54%), while only a third manage Ksh 1,500–5,000
- General knowledge about Environment and REDD: In terms of the perceived relationship between environmental protection and livelihoods, most (84%) of the respondents thought it was bad. This was predominantly related to conflicts with elephants damaging crops, property or humans; a few mentioned livestock predation and other wildlife conflicts (e.g., baboons). Although 75% of the respondents said they had heard about the REDD carbon project, a majority (78%) of them said it had had no effect to them. Crucially, 17% stated that it had effected, or feared it would affect, their access to forest-related products.



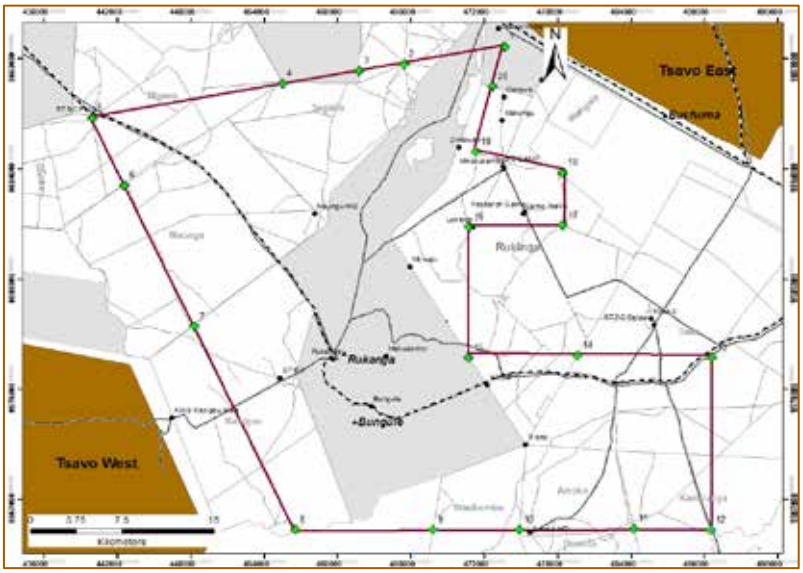
Households where the Social Impact Assessment questionnaire was administered for the Kasigau Corridor REDD Project in 2012

2.2.14.9 Aerial Transect

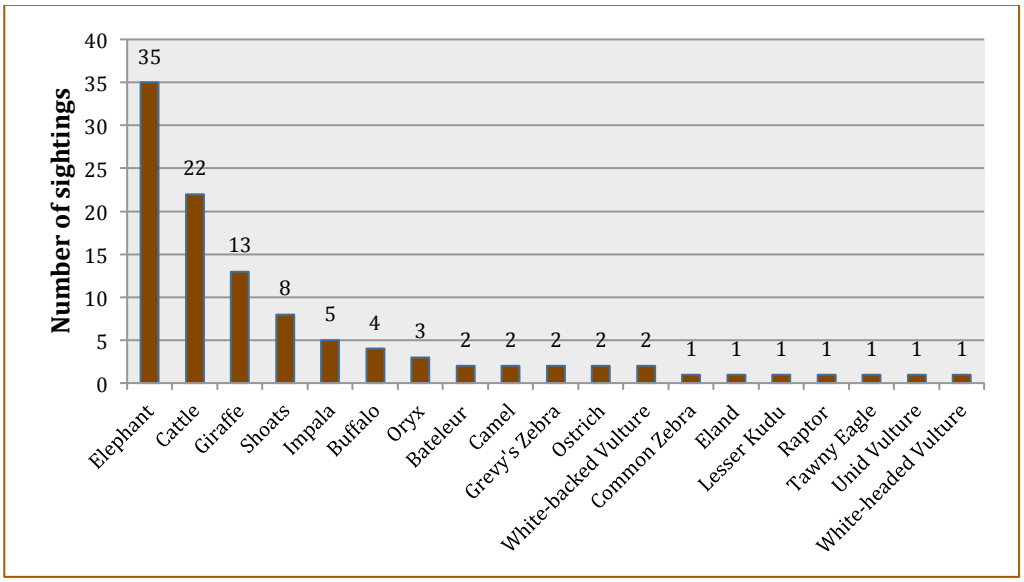


In October 2012, following a few trial tests, we conducted our first proper aerial transect from a gyrocopter. This is a 180 km transect line traversing the entire Project Area (See figure below) which takes approximately 2 hours to complete. This will be conducted at least once every two months for the coming year monitoring both wildlife as well as other incidences such as livestock, charcoaling activities, poaching etc.

Two transect-runs were completed in October and December 2012 from which a total of 160 entries were made: 79 species, 56 incidences, 17 bomas with livestock; the rest were waterholes which we monitor the water levels. Elephant was the most commonly encountered species (including, an exceptional group of about 120 individuals with 20 juveniles in Mgeno Ranch), followed by cattle and giraffe (see figure below). Other species of interest included Grevy's Zebra and the rarely seen White-headed Vulture.



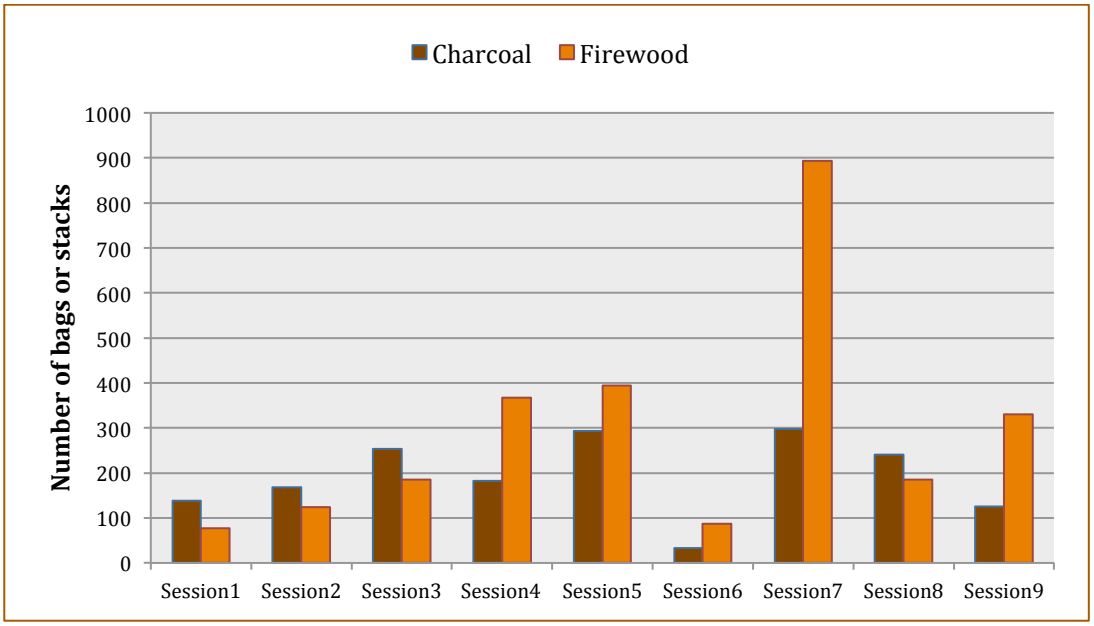
The permanent aerial transect in the Kasigau Corridor Project Area, mainly covering Phase I & II



Total number of encounters of all species (including livestock) seen during aerial transect counts in October and December 2012

2.2.14.10 Charcoal and Firewood Monitoring

Since February 2012, we have been conducting monthly counts of the amount of fuel wood along the Nairobi-Mombasa Highway along the section that touches our Project Area i.e., Voi town to McKinnon Road town, a distance of about 63 km. Over nine sampling sessions, a total of 332 incidences were encountered, 196 of which were charcoal and 136 firewood. There was an average of 21 and 15 charcoal and firewood encounters along the transect, respectively per session. Over the nine sessions, there was a mean of 192 charcoal bags and 294 firewood stacks along the 63 km stretch; this would be slightly higher if the July session (Session 6), which had unusually few records is omitted (see figure below).



Number of charcoal bags and firewood stacks counted along the Nairobi-Mombasa Highway between Voi and McKinnon Road in 2012

2.2.14.11 Charcoal Traders Survey

In 2012, we also conducted a short survey of the charcoal and firewood traders along the stretch of the road from Voi to McKinnon Road. This was meant to complement the charcoal and firewood monitoring above by understanding the people behind the trade in this area as well as the business itself, key drivers, and potential alternatives. This data is currently being analyzed. The questionnaire used focused on five key areas besides the preamble where the interviewers introduced themselves and obtained consent:

i. Basic household information: including household size, ethnicity, age and other income sources

ii. Buying price: this included whether they were predominantly primary or secondary producers, plus the costs of acquiring a bag of charcoal or stack of firewood. This also included a question on the commonest and/or most preferred trees, if they have changed over the years, and how this impacts on prices

iii. Retailing price: this was about the prices they sold their charcoal or firewood at, and what influenced this

iv. Sales: was about the numbers moved and how these change over the course of the year or any changes in the medium term

v. Final general issues: these included sources of the fuelwood; their major customers; and general feelings about the business – why they do it and any alternative that they would prefer/accept.

2.2.14.12 Amara Radio Survey

Wildlife Works was also involved in this short radio listening survey in collaboration with Amara Conservation Group, designed to establish both what various people in the Project Area like to listen to at the moment, and why, and what they would be looking for in a new station. Although not a Wildlife Works initiative, it was deemed strategic to get involved due to the potential synergies, both for spreading the REDD-carbon message as well as other key information e.g., weather-related forecasts, which our household survey above showed to be lacking. Some of the knowledge gained from this study, e.g., preferred means of communication would also be directly useful for Wildlife Works' Community Liaison teams in designing modes of information dissemination.

A total of 108 questionnaires were administered across the five project locations within which the Kasigau Corridor REDD Project Area. Within each Location, 2 shopping centres were selected, within which 4 villages were selected. Some highlights included:

- Best qualities of a new radio station: Three general themes that stood out as best qualities were: (i) candidness and open discussions; (ii) a local touch (employment, local language and local issues); and (iii) a good signal and wide coverage. These desired qualities were similar across different age groups and sexes
- Preferred programmes in the new station: Local news topped the list of the programmes that the respondents would like to listen to in the new station, followed by good music and

(environment) conservation issues. Advice programmes and religious matters completed the top-five of preferred programmes

- Best modes of presentation: When asked which of the four modes of presentation they preferred the most to deal with difficult matters, a majority mentioned calling-in as the most preferred mode; expert talking and comedy programmes made up most of the other responses. These preferences did not vary by age or gender.

2.2.15 Community Wildlife Scouts

Wildlife Works is continuing to fund eight CWSs in Marungu location and CWSs in Kasigau location. The locational Community Based Organizations (CBO) primarily manage CWSs. At this time, the CBOs in the Mwachabo, Sagalla and Mwatate locations do not have the capacity to manage new CWS recruits. However, Wildlife Works will be working with the CBOs to build their capacity to recruit similar numbers of CWS in these locations.

2.2.16 REDD Carbon Inventory Monitoring

As per VM0009 and the VCS Project Description (PD), 20% of the 115 plots have been sampled for annual monitoring of carbon by Wildlife Work's team of 13 samplers. The teams have also worked on the Leakage and Quality Control plots.

2.2.17 Rukinga Sanctuary infastructure improvements

In the 2012 monitoring period several additions and improvements were made to the Rukinga Sanctuary carbon office and staff facilities. As the primary carbon office has been placed on the Rukinga Sanctuary several improvements were needed to accommodate the expanding staff and functions that are housed at this site. This was an essential activity to maintain oversight of the Project and be able to expand the capacity of the project staff.

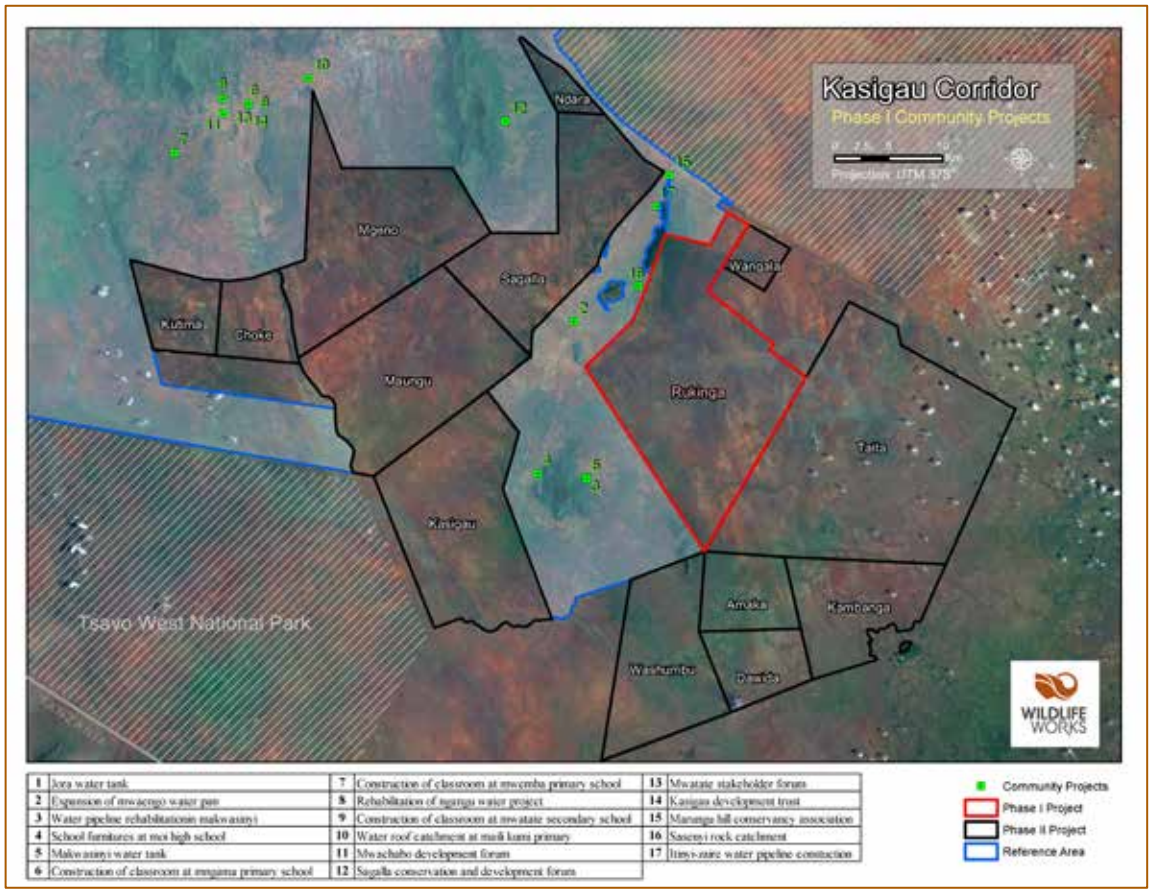
Describe how each project activity has achieved the expected community and biodiversity impacts, and any unexpected impacts not included in the project description, and their relevance to achieving the project's objectives (see G3.2).

Wildlife Works has been engaged in the Project Area for over ten years, and unlike previous NGOs in the area, that typically set up projects, left the area, and pay sporadic visits to "see how things are going", Wildlife Works has had employed a hands-on approach since the very beginning of our presence in Kenya. The company employs now over 400 local people in a range of activities that has significantly expanded with carbon funding, and has reached full stride during this monitoring period (m_3) The activities are also listed above in Section 2.2, but are listed below as well:

Wildlife Works Sustainable Development Initiatives

Wildlife Works implemented a wide range of sustainable development initiatives in the Project Area over the past ten years, and has started a new range of innovative co-benefits for the communities now that carbon funding has begun to flow. These initiatives collectively form the basis of Wildlife Works' leakage mitigation strategy, and an implementation schedule for these Project Activities, with timelines and budgets is perpetually available to the auditor for perusal.

In Section 2.2 above a list is provided of Project Activities that have were initiated during the first verification period and are continuing to thrive during this monitoring period: m_3: January 1st, 2012 to December 31st, 2012. Descriptions of each activity and updates on their status are provided in the subsequent sub-sections above, with fuller descriptions provided in the CCB PDD Section G3.2. These activities were originally supported using carbon funds from Phase I (Rukinga) of this project and are now sustained with both Phase I and Phase II carbon credit proceeds. It should be noted that the bulk of Project Activities were designed to be implemented at or near the commencement of the Project. This list, therefore, remains relatively constant throughout the project crediting period. Any additions to the list, in the form of newly initiated activities, or significant changes to existing activities will be described in this and all subsequent monitoring report/PIR documents. The following map shows the location of the projects implemented during the current verification period, m_3: January 1, 2012 through December 31, 2012:



Major Project Activities commenced in the current verification period

2.3 Management of Risks to Project Benefits (G3)

Describe the implementation of measures to mitigate likely risks to the expected climate, community and biodiversity benefits during the project lifetime. Describe the implementation of measures to maintain and enhance the climate, community and biodiversity benefits beyond the project lifetime (see G3.5 & G3.7).

Major identified risks that could have impact on the Project are listed as follows:

- Change in legislation – government expropriating the land through compulsory purchase for development scheme. As the Government of Kenya is very supportive of our project, and has no recent history of expropriation of private conservation lands, this risk is however very low. We will continue to seek international press for our project, as keeping it in the spotlight promotes awareness, and reminds the Government of the value it is adding to the country of Kenya.
- Income – risk that revenues from the sale of carbon credits do not meet projected sale volumes or credit values to sustain the project financially. Financial sustainability was modeled at extremely conservative carbon offset credit sale values and volumes. This project is a very popular project with high potential value in the marketplace. The likelihood of financial insolvency is therefore deemed to be very low.
- Crop failure - substantial and repeated crop failure in surrounding communities could lead to increased poaching and use of the forests for financial benefit. The risk of the occurrence of this is deemed to be high. Virtually all of our alternative economic development efforts are aimed at mitigating this risk.
- Invasion of cattle grazers due to famine in adjacent communities, or lack of grazing elsewhere. Even though an influx of cattle would affect the quantity of grass in the Project Area, it would not lead to any significant change in carbon stock. There is a risk of this happening, especially as Somalis have used the land in this area to feed and water their cattle over the years, sometimes with permission from landowners and sometimes without. However, given the increasing aridity in the area, we believe Somali cattle herders will be forced to look elsewhere for rangelands. We will be using carbon funding to increase ranger patrolling to better protect the Project Area from illegal incursion.
- Drought – drought is an increasing reality in this area of Kenya. We anticipate that climate change will worsen this problem throughout the project-crediting period. Drought inherently introduces two additional risks:
    - Wildlife – drought places severe stress on wildlife in the Project Area. However, many of the species living in this ecosystem are extraordinarily drought-adapted, and have little problem surviving in extended periods without rain. For those that aren't, we plan to continue to provide emergency water sources at all the ranches in the Project Area. More detail on this issue is provided in the CCB PDD in Section GL1.2.
    - Cash crops – drought will render the survival of cash crops, such as jojoba and citrus trees more difficult. However, these high value cash crops will be planted sparingly so as to minimize water demand. Additionally, these crops require much less water than a comparable maize field, and are able to survive higher temperatures, provided they receive some water. Farmers will be in a position to provide this in order to preserve the financial value of the crop under project funding.
- Fire – grass fires are common in the region due to intense heat and dry conditions. Naturally occurring fires are extremely rare, with the majority caused by humans, either accidental or intentionally set. Our strategy is to continue educating the local population, especially the youth, about the dangers of burning fallows, which is often done to improve grazing for their animals. Fires tend to burn the grasses and shrubs, but move very quickly, and typically don't kill trees, as the species present are generally grass-fire tolerant.

Measures Taken to Enhance CCB Benefits Beyond Project Lifetime

The Kasigau Corridor REDD Phase I Project is a component of a comprehensive conservation project being executed by Wildlife Works since 1998. It is our intention to utilize carbon funding provided by the REDD project to make necessary investments in job creation and income generation activities in order to sustain financial stability into the foreseeable future. We have demonstrated the effective management of carbon proceeds throughout the first and second verification periods, achieving consecutive successful verifications, making it the most advanced REDD+ project validated under VCS and CCB. The Project has executed carbon right agreements in the Project Area and received carbon proceeds through the sale of credits in the voluntary market as an operational REDD project. As a result, landowners now realize the value of their carbon. It is our intention to get these CRAs registered as full easements against the title deed of the land, although there is no perfected mechanism under Kenyan law as of yet. Our approach to transfer knowledge and our assistance in creating conservation institutions within the community speak to the efforts to ensure the CCB benefits extend indefinitely into the future.

It is Wildlife Works' intention to create a lasting culture of employment and financial health in the Project's sphere of influence. To that end, every job created thus far, and every job slated for creation in the future upon receipt of carbon funding, is designed to last not only throughout the project crediting period, but well beyond. Through job training, such as in our EcoFactory, members of the surrounding communities are building their capacity and gaining new skills, which will be lasting result of this project into the future. Carbon revenues have, and will continue to change the face of these communities, and Wildlife Works has effectively raised awareness about the link between forest / wildlife protection and the availability of sustainable employment. We have made detailed job creation information available to the public, and included many of the metrics in the various versions of this document. For virtually each and every Project Activity, as one of the measures of success, we will be tracking the number of jobs created as a direct result of that activity. Employment information will be reported in each PIR/Monitoring report throughout the lifetime of the Project. The types of job created by the Kasigau Corridor REDD Project activities, whenever possible, are full-time, permanent positions, designed to last well beyond the crediting period.

2.4 Measures to Maintain High Conservation Values (G3)

Describe the implementation of specific measures to ensure the maintenance or enhancement of High Conservation Values attributes identified in the project zone (see G3.6).

The Kasigau Corridor Phase I REDD Project holds a dryland forest biome that doubles up as an important migratory corridor and range extension area, especially for elephants and other wide-ranging wildlife such as big cats from the protected parts of the Tsavo Conservation Area. It contains several critically endangered wildlife including Grevy's Zebra and African Wild Dog, as well as others considered to be under threat globally (e.g., Lion, Cheetah, Elephant, several vultures, and the Secretary Bird). In addition, adjacent to the Kasigau Corridor REDD Project Area is the majestic Mt. Kasigau, an important site holding a threatened cloud forest ecosystem that provides basic services for wildlife in critical (dry) situations. It also provides critical and fundamental livelihood and cultural resources for local communities.

Wildlife Works' entire Kasigau REDD+ Project set-up is designed to maintain these High Conservation Values (HCVs) within the Project Area and at Mt. Kasigau from four main fronts: security provision, habitat enhancement, community engagement and a commitment to long-term

monitoring.

1. **Security provision and enhancement:** 2012 saw a sharp increase in elephant poaching, both locally and globally. In an effort to counter this, Wildlife Works instituted several initiatives:

    - *Increased ranger force:* our ranger force was increased from 72 in January to 84 in December 2012, including the hiring of 4 female rangers. In addition, we increased the number of watchmen from 14 to 24 during the same period in order to free up rangers for wildlife security matters. These rangers maintain approximately 10 daily foot and car patrols from 8 outposts distributed across the entire Project Area. These patrols are coordinated by Eric Sagwe on each day focusing on particular areas of risk, such as entry points and high charcoal production areas.
    - *Ranger Posts:* Conditions in the 6 existing ranger outposts were improved by supplying them with improved solar power supply. Additionally, the surveying of sites for two mobile outposts (for easy deployment of units in areas of greatest need) was completed in 2012. These mobile outposts will initially be set up in Sagalla and Kutima ranches.
    - *Kenya Wildlife Service (KWS) collaboration:* Wildlife Works rangers remain an unarmed force. To help protect the rangers and coordinate larger actions the working relationship with the KWS Special Operations Teams was strengthened in 2012. This included providing accommodation for their teams at our key outpost (called 6-0) during times of heightened poaching activity.
    - *Collaboration with other organizations:* Lastly, whenever appropriate, Wildlife Works also engages like-minded conservationists in fighting the poaching menace, and in 2012 flew in tracker dogs from Mbirikani Ranch in the Chyulu Hills to track poachers who had murdered two KWS rangers.

2. **Habitat enhancement in Project Area:** Water being the critical limiting resource in this dryland ecosystem, we improved water availability for wildlife in the Project Area in 2012 by scooping 4 more waterholes in Rukinga Ranch (in addition to the four scooped in 2011). This effort will be strategically expanded into the other ranches immediately. 2012 also saw a pilot effort at improving vegetation cover by re-foresting areas previously cleared for cattle *bomas* (kraals). 7,000 seedlings were planted in one such big boma in Rukinga ranch around Mwakaramba Tank (see picture). Survival will be closely monitored, evaluating the usefulness of a temporal solar-powered electric fence to keep away elephants, so as to inform future re-forestation efforts of such areas across the Project Area



    - *Habitat enhancement in Mt Kasigau:* a total of 2,450 seedlings were planted in November 2012 around the mountain in neighbouring schools and farms in an effort

to reforest the landscape and reduce pressure on the trees on the mountain. Sites planted included: Bungule Primary, Jora Primary, Rukanga Primary, Ngambenyi Primary, Moi High, Malewa Trust (private), Kiteghe Primary, Ian Pesa (private), Makwasinyi Primary and Kasigau Girls. Survival will be monitored in 2013.

3. **Community engagement:** this took place on both the local and international fronts:
   - Locally, other than community outreach efforts of the Community Liaison team at Wildlife Works, in an effort to reduce human-wildlife conflict, one community – Sasenyi – was provided with deterrents (e.g., bright torches) and food at the height of elephant crop-raiding to help them stay outside at night to repel elephants.
   - Internationally, in 2012, Wildlife Works hosted and supported the filming of an anti-poaching documentary aptly named **Ivory Wars.** This exciting documentary highlights the plight of the African Elephant, the intricacies of the trade and dangers facing those assigned to protect them. It was shot in Rukinga Ranch as a three-part series set to be aired in 2013 on a major U.S. cable network. To further increase awareness, we set up, and currently maintain, an anti-poaching blog on our website.

4. **Entrenching monitoring:** the detailed biodiversity and social monitoring activities (outlined in 2.2.14) illustrate Wildlife Works' efforts to monitor both wildlife and vegetation in and around Mt. Kasigau, including foot, car and aerial surveys and camera traps. To backstop these efforts, a fully functional Research Camp was completed and furnished inside Rukinga Ranch in 2012. It currently holds residential houses for the Biodiversity and Social Monitoring staff and functional office complete with internet and power options as well as basic GIS capability (see photo at right). This compound will be expanded to house a campsite and extra accommodation for visiting researchers. Wildlife Works supports a long-term view of entrenching the monitoring and research components that will support implementation of the REDD programme.



5. **Donation to Bird conservation:** Within the Reference Area of the Kasigau Corridor REDD Project lie the Taita Hills, whose indigenous forests hold globally important biodiversity (as part of the Eastern Arc Mountains Hotspot). They are recognised as an Important Bird Area in Kenya, due to the presence of the two Critically Endangered bird species: the Taita Thrush and Taita Apalis. In an effort to aid in the conservation of these two important species, Wildlife Works contributed Ksh 23,1800 (USD $2,800) in 2012 for their monitoring in the six small forest fragments in which they continue to subsist. This was completed under the auspices of BirdLife International's *Species Guardian initiative*. Dr. Mwangi Githiru, Wildlife Works' Director for Biodiversity and Social Monitoring is the 'Species Guardian' for both species (http://www.birdlife.org/extinction/pdfs/Taita_spp_Guardian_Action_Update.pdf).

2.5 Project Financing (G3 & G4)

Describe how financial mechanisms have provided an adequate flow of funds for project implementation and to achieve the anticipated climate, community and biodiversity benefits. Document the financial health of the implementing organization(s) (see G3.11 & G4.7).

Project Financial Support

Wildlife Works is responsible for project implementation and support with funding coming from successful sale of credits from Phase I and Phase II of the Project. Project financial information, including the project profit and loss statement and carbon credit sales all demonstrate the financial strength of this project. This information is commercially sensitive and will be shared with project auditors at the site visit upon request. All costs associated with carbon inventories and development of project design documents have been met by Wildlife Works.

Financial Health of Implementing Organizations

Wildlife Works Carbon LLC. is a Delaware registered Limited Liability Corporation in good standing, majority owned by Wildlife Works, Inc. and Mike Korchinsky.

Wildlife Works, Inc. is a US registered corporation and, as such, is governed by the corporation laws of California which ensure that, at all times, the company remain financially solvent and able to meet its liabilities.

The company is owned by independent shareholders of good standing and has a Board of Directors comprised of 4 members. It is sufficiently capitalized through its Joint Venture with Wildlife Works Carbon LLC to ensure completion of the Project. Wildlife Works Carbon LLC has also received several high-profile investments from international corporations who support Wildlife Works' mission and believe wholly in its cause. Such deals include multi-million dollar investments from Allianz SE and PPR as well as advance purchases from BNP Paribas, Nedbank SA and PPR Home. For more information on the details of these investments and pledges, visit the following links:

PPR Home Invests in Wildlife Works
Wildlife Works / Nedbank Agreement
BNP Paribas Invests in Wildlife Works
Allianz Invests in Wildlife Works

Please see the CCB PDD, Section G3.11 for further details on project finance. All project financial information is held at the Carbon Office in Rukinga, Kenya. Wildlife Works also employs a full-time bookkeeper and accountant who is assigned to both the Phase I and Phase II projects.

2.6 Employment Opportunities and Worker Safety (G4)

Describe training provided for the project's employees and relevant people from the communities. Describe how people from the communities have been given equal employment opportunities. Describe the implementation of measures to inform workers of risks to their safety and to minimize such risks (see G4.3-4 & G4.6).

Capacity Building and Community Employment Opportunities

Wildlife Works has always provided training for its employees in Kenya, starting from the early days when we built a factory and taught local women how to sew from first principles. We have trained local wildlife rangers, factory workers and supervisors, organic greenhouse workers, personnel managers, and forest inventory specialists (plot sampling teams). We have provided the validator with training programs for Wildlife Works rangers, factory workers and greenhouse workers. The most recent specialized hires have been for the Biodiversity Monitoring Team, which involves geo-location of animal sightings, detailed inventory management and reporting and skilled field techniques.

As mentioned above in section 2.2.1, Wildlife Works has supported the development of community based organizations (CBO), whose aim it is to win and manage carbon-funded activities. The CBOs are trained in grant writing and management, project management, accounting and other key skills pertinent to developing the communities in the area. The goal is for these CBOs to eventually become 100% self-sustaining, but at their request they are currently under the tutelage and financial support of Wildlife Works. Without carbon funding, the CBOs would not have been implemented, and Wildlife Works is proud to be able to present the communities in the sphere of influence of the carbon project with the capacity to manage their funds accordingly.

Employee Safety

Wildlife Works is committed to worker safety and has a very strong track record thereof. In the field of wildlife management, it is impossible to remove all risks, as our rangers walk every day in the bush that is now full of wild animals. Additionally, due to the illegal trade in ivory, armed poachers are also present in the Project Area. In January of 2012, one ranger was killed and a second severely injured in an ambush attack by poachers. In response to this incident, rangers have been outfitted with improved field medical kits designed for application in life-threatening situations in remote areas. Additionally, special training in the use of these kits has been provided to reduce the risk of serious injury or casualty. We provide full training and close guidance to our rangers, educating them on how to avoid conflict with armed poachers and dangerous wildlife. We also insure all our full-time employees under the National Health Insurance Fund (NHIF) and the National Social Security Fund (NSSF), which also covers spouse and children. In addition, as a company policy, we provide each employee with up to Ksh 10,000 worth of medical allowance at the local doctor in the town of Voi.

As part of our partnership with PUMA, we underwent a PumaSafe Audit. This was to ensure that the Wildlife Works EcoFactory met PUMA's standards for workers' rights, and health and safety. As part of this audit a first-aid room was built and equipped, as was a staff kitchen and canteen. The Kenyan Red Cross held two training sessions in first aid and personal health, training 40 EcoFactory workers, rangers and greenhouse staff.

Hazards associated with jobs performed are as follows;

Hazard	**Mitigation**
Sewing Factory Employees	All risks are identified in training manual provided to Validator along

	with how to avoid risk.
Needle sticking fingers	Finger guards are provided, sharps bin is provided for safe disposal of needles that are replaced
Inhalation of fibers	Face masks are provided
Fire	Fire exits clearly marked, no smoking in factory, fire fighting stations in factory, three doors out of facility
Greenhouse Employees	All risks are identified in training manual provided to Validator along with how to avoid risk.
Exposure to Chemicals	Only non-toxic chemical free organic materials used in Greenhouse therefore no toxic or caustic chemical exposure. Rubber gloves and protective eye gear provided if needed.
Inhalation Hazard	Only non-toxic chemical free organic materials used in Greenhouse therefore no toxic or caustic chemical exposure. Masks provided during spraying of organic pesticides.
Temperature Extremes	Frequent breaks and availability of water during hot conditions. Shade cloth covering of work area.
Slip, Trip and Fall	Ensure work is clear of all slip or trip hazards before work begins.
Lifting	Use proper lifting techniques, always get help for lifting heavy objects.
Cuts	Wear gloves, keep tools sharp and always be aware of the proximity of fingers to blades when making cuts.
Electric Shock	There is no electricity at all at the Organic Greenhouse.
Pinching and Crushing Points	Wear gloves, keep tools sharp and always be aware of the proximity of fingers to blades when making cuts.
Inclement/Adverse Weather	Organic Greenhouse located adjacent to Ranger station so employees can

	retreat indoors in adverse weather.
Snakes, animals	Keep greenhouse floor clear of organic debris for clear visibility, always be aware of the possibility for snakes, spiders, scorpions to be present, and do not approach or touch if seen.
Wildlife Works Rangers	All risks are identified in Ranger training manual provided to Validator along with how to avoid risk.
Elephants, Lions, Buffaloes, Snakes etc.	Training is given in how to approach, identify and stay a safe distance from potentially dangerous animals. First Aid training is provided in cuts, limb fractures, snakebites, dehydration and other possible health risks. Team design of 6 minimizes risk.
Poachers	Training is given in how to track, and peacefully apprehend poachers if possible and how to avoid confrontation with armed and aggressive poachers. Team design of 6 minimizes risk.
Sun Exposure, thorns etc.	Rangers are all provided with uniforms with long sleeves and long trousers and brimmed hats and boots. Lots of drinking water available at Ranger posts.
WW/Tsavo Soap Factory	All risks are identified in Soap Factory Safety training manual provided to Validator along with how to avoid risk.
Lye	Comprehensive instructions are given on how to mix lye safely, and goggles and gloves are provided for employees.
Oils, Gas heating	Vegetable oils are only heated to 50-55° C, so are only hand warm. Gas stove is simple self-igniting LPG camp stove.

2.7 Stakeholders (G3)

Describe how communities and other stakeholders potentially affected by the project activities have been involved in project design through effective consultation, and how their submission of comments on this monitoring & implementation report to the Climate, Community & Biodiversity Alliance (CCBA) has been facilitated during the CCBA public comment period. Describe the implementation of the formal process for handling conflicts and grievances that arise during project planning and implementation (see G3.8-10).

Stakeholder Engagement

Please refer to sections G3.8-G3.10 in the CCB PDD for details of Wildlife Work's commitment to stakeholder engagement and consultation.

Public Comment Period

The Kasigau REDD Project, Phase I – Rukinga Sanctuary Project Monitoring and Implementation Report (MR/PIR) has been posted for public comment on the CCBA website (http://www.climate-standards.org) and it was open to comments for 30 days (January 25th to February 24th, 2013). The document was also made available to the public in hard copy during the public comment period at our carbon offices in Rukinga, and at several other communities involved in Phase I. Affording local stakeholders an opportunity to review the documents and to raise any issues.

The hours for the Carbon offices are 8:30 am to 4:45 pm Monday through Friday.

Grievance Policy and Process

Wildlife Works' Conflict Resolution Process has been formalized in a document called the "Wildlife Works Community Conflict Process" which was provided to the validation/verification auditors upon request, and is available at the Rukinga carbon office. Any comments that are submitted, which require adjustment of the document will be addressed promptly, and for the life of the Project. We aim to continue our open door policy with members of the community. All comments and conflicts are documented for the life of the Project, together with their resolution, which will typically involve mediation by the local administrative chief. We are familiar with this process throughout interaction with community for ten years, and we are committed to providing written responses within 30 days.

Wildlife Works' grievance policy was updated as a result of CL2 from last year's monitoring report (m_2):

Wildlife Works' open-door policy is always communicated to the project stakeholders through the frequent community barazas (meetings) organized by the Community Liaison. In future, we will enhance the grievance airing mechanism in two ways. First, in order to ensure that all stakeholders in the Project Area know and understand about Wildlife Works' open-door policy, we shall (i) hold quarterly Locational barazas specifically for providing project updates and providing a forum for airing grievances, and (ii) have a permanent insert into our quarterly newsletter informing the readers of this policy and various avenues of airing grievances. In addition, we have established suggestion boxes at each chief's offices in the five locations for persons wishing to remain anonymous. We shall establish an inclusive and transparent mechanism for opening and dealing with any complaints dropped in the boxes. Lastly, notice boards have been put up outside

of chief's offices where project updates are posted regularly posted for the entire community's access. This update was successful in satisfying the audit clarification, and it was closed henceforth.

During the m_3 monitoring period no grievances or conflicts were reported to Wildlife Works. This includes comments from the community barazas, the chief's suggestions boxes or any verbal complaints to Wildlife Works office staff or to chiefs.

3 LEGAL STATUS

3.1 Compliance with Laws, Statues, Property Rights and Other Regulatory Frameworks (G4 & G5)

Identify and demonstrate compliance of the project with all and any relevant local, regional and national laws, statutes and regulatory frameworks.

Include a list of all relevant laws and regulations relating to worker's rights and all applicable international treaties and agreements and, where relevant, demonstrate how compliance was achieved. Provide evidence that the project has ongoing approval from the appropriate formal and/or traditional authorities, as appropriate (see G4.5 & G5.1-2).

Wildlife Works operates within all local and national employment laws, and has been doing so for over 14 years in the country of Kenya. Like any business, Wildlife Works is subject to periodic audits by the Government Employment Officer. We have always passed all inspections, whether from local officials or International agencies such as Verite.

The laws that are relevant to this project are as follows:

EMPLOYMENT LAWS.

Export Processing Zone's Act (Cap. 547)
As an Export Processing Zone (EPZ) company we are exempted from the standard Labor Laws of Kenya. Instead we must conform to those laws that that have been deemed applicable to General Provisions of the Employment Act (Cap 226-229) or amended for EPZs as covered by the Export Processing Zone's Act (Cap. 547).

National Health Insurance Fund
N.H.I.F was established on 12th July 1966 by an Act of Parliament (Cap 255) of the Laws of Kenya, and later became a state corporation on the 15th February 1999 through an Act of Parliament no.9 of 1998. The objective of its establishment is to enable majority of Kenyans to access healthcare services at supplemented costs. Contribution to the fund are compulsory for all persons whose income is Ksh.1000/= and above. To ensure our full compliance with this regulation a Wildlife Works representative visits the NHIF offices in Voi monthly. Our monthly payroll is submitted and the NHIF staff calculates our monthly contribution, which is then paid in full. Additionally, we are subject to random checks by the NHIF inspector, who makes unannounced visits to our facility to inspect our books. We have always been found to be in full compliance of this act.

The National Social Security Fund Act (Cap 258)
The National Social Security Fund Act of 1965 created this fund for the benefit of the members. It is a compulsory savings scheme into which the employer pays a statutory contribution for every employee who is a member. We physically go to the NSSF offices in Voi monthly to submit our monthly payroll on a NSSF form, and we pay the monthly dues. We are subject to strict audit checks by the NSSF inspector who visits our facility every two months and on passing the audit provides us with an official letter indicating we are in compliance. We have always been found to be in full compliance of this act.

Pay As you Earn (P.A.Y.E)
Section 37 of the Income Tax Act.
The "Pay As You EARN" method of deducting income tax from salaries and wages applies to weekly wages, monthly salaries, annual salaries, bonuses, commissions and directors fees (whether the director is resident or non-resident). We are required to go to the Kenya Commercial Bank (KCB) on a monthly basis to pay the withheld tax from our employees' wages and salaries. The bank takes one folio from our KRA receipt book, and stamps the other two folios, one of which we then take to the KRA office in Voi and provide it to them.

The Factories and Other Places of Work Act (Cap 514)
The Factories Act deals with the health, safety and welfare of an employee who works in a factory or other place of work. This Government department has never audited our facilities, as it is very small and covers the entire country. However, we have good reason to believe we are in full compliance with this act as a result of a third party audit of our factory and operations performed by the independent NGO Verite, from the USA.

FairTrade
As of 2012, the 3 Wildlife Works EcoFactories are now certified Fairtrade.

The Work Injury Benefits Act (Cap. 236)
This Act ensures that companies have systems in place so as to provide any employees who are injured on duty with adequate compensation from the employer. We are required to maintain private insurance to cover our responsibility under this act.

Regulation of Wages and Conditions of Employment Act (Cap. 229)
This act sets the conditions of work and the minimum wage guidelines. The EPZ Act supersedes this act with regard to minimum wage and in fact the EPZ minimum wage guidelines are slightly higher than the National Employment Act guidelines.

Labor Relations Act, 2007 (Acts No. 14)
This is the new version of the old Trade Unions Act and the Trade Disputes Act, revised to harmonize the old Trade Acts with Kenya's recent ratification of many of the elements of the ILO Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87). We are required to provide our workers with the freedom of association. We are required to honor a dispute process as laid out in the act. We currently have no collective bargaining agreement in place nor are we required to do so. We have never had a dispute with any employee that resulted in any collective action, lock out etc. and we have no disputes at all at this time, and we believe that we are in full compliance with this Act. To ensure that employees are aware of their rights under the Act, the following language is included in all employment contracts issued by Wildlife Works in Kenya.

"Wildlife Works, EPZ Ltd. acknowledges the importance of the recently enacted Labor Relations Act 2007, and therefore we wish to inform you that you are entitled to Freedom of Association, and specifically to join the Kenya Textile Workers Union (KTWU) should you so choose. Should you choose to join the KTWU, all membership dues and agency fees for the Union will be payable directly by you."

3.2 Evidence of Right of Use (G5)

Provide evidence of right of use with respect to the GHG emission reductions and removals (see G5.6)

At present, it is not common practice to register a carbon easement against title in Kenya, although the Environment Act did envisage such a concept, but not explicitly. Wildlife Works has committed written approval from the landowners that should such a possibility exist, they would cooperate fully with Wildlife Works in ensuring the successful registration. As it stands, Wildlife Works has conducted a full Free, Prior and Informed Consent campaign with the Ranch Owners (see CCB PDD Section 5.3).

3.3 Emissions Trading Programs and Other Binding Limits (CL1)

Where applicable, demonstrate that net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions (see CL1.5).

Kenya, at the present time, has no nationally instated emissions cap, and it is likely that as a poor country with very low historic emissions, it will not be subject to one in the near future. Wildlife Works is in close contact with the Kenya Forest Service, the focal point for REDD within the Kenyan Government, and we expect no issues with double counting even when and if Kenya formalizes a jurisdictional / nested approach. We are currently working with the Government of Kenya (GoK) to integrate the Kasigau Corridor REDD Projects into the first Jurisdictional program in Kenya, which will be focused in the Coast Conservancy area (formerly the Coast Province).

3.4 Participation under Other GHG Programs (CL1)

Indicate whether the project has been registered, or is seeking registration under any other GHG programs. Where the project has been registered under any other GHG program, provide the registration number and details (see CL1.5).

The Kasigau Corridor Phase I – Rukinga Sanctuary REDD Project is not registered with any other GHG program, nor is it seeking registration with any. This is with the sole exception of the possible inclusion of the Project into a Kenya wide jurisdictional / nested REDD+ initiative (JNRI) approach. As Wildlife Works will be instrumental in the development Kenya's JNRI Program, the Kasigau Corridor Projects will be the first projects to participate in the jurisdictional program, and it will therefore be ensured that there are no conflicts with any existing or other GHG programs. In fact, Wildlife Works is in wide support of the VCS JNR program, and wishes to assist in its implementation. Any existing VCS project is guaranteed not to conflict with their own JNRI system.

3.5 Other Forms of Environmental Credit (CL1)

Demonstrate that the project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program, or that any such credit has been or will be cancelled from the relevant program (see CL1.5).

The Kasigau Corridor Phase I – Rukinga Sanctuary REDD Project neither has, nor intends to generate any other form of GHG-related environmental or GHG emission reductions or removals claimed under the VCS program.

3.6 Projects Rejected by Other GHG Programs (CL1)

Indicate whether the project has been rejected by any other GHG programs. Where the project has been rejected, provide the relevant information (see CL1.5).

The Kasigau Corridor Phase I – Rukinga Sanctuary REDD Project has, and we don't believe ever will, be rejected from any other GHG program, or any GHG program.

3.7 Respect for Rights and No Involuntary Relocation (G5)

Demonstrate that free, prior and informed consent has been obtained from those whose rights may be affected by project activities. Demonstrate that the project has not required the involuntary relocation of people or of the activities important for the livelihoods and culture of the communities (see G5.3-4).

Nobody currently or historically lives within the Project Area. Therefore, the Project does not involve the relocation of any people. The Project will never re-locate any people that could encroach on the Project Area lands, although we actively prevent this from occurring. Prior to the project start date members of the community and/or immigrants had illegally cleared almost 4,000 hectares of the Project Area for farmland but those involved had returned to their home province or voluntarily relocated to the newly formed Sasenyi Valley Land Cooperative prior to the project start date.

3.8 Illegal Activities and Project Benefits (G5)

Identify any illegal activities that could affect the project's climate, community or biodiversity impacts and demonstrate that project benefits are not derived from illegal activities (see G5.5).

The illegal activities that may be conducted from time to time in the Project Area include poaching of animals, both for animal products, such as elephants for their tusks, or for bush meat. Additionally, hardwood trees may be cut down for charcoal production or for building poles. Land could also be cleared for small-scale farms by members of the surrounding communities.

No project benefits are derived from any illegal activity. Wildlife Works has established a long and successful track record of monitoring the Project Area for any illegal activities and stopping them. As described in other sections of this report, our rangers have caught many poachers and charcoal burners before they were able to do significant damage to the ecosystem, and have established a close working relationship with Kenyan government authorities. Wildlife Works

always employs non-violent practices when dealing with perpetrators of illegal activities on the Project Area. Neither the Project, nor members of the community related to the Project, benefit in any way from these illegal activities.

4 APPLICATION OF METHODOLOGY

4.1 Title and Reference of Methodology

Provide the title, reference and version number of the methodology(s) applied to the project.

The Project utilizes VM0009 *Methodology for Avoided Mosaic Deforestation of Tropical Forests* V1.1, approved by the VCS for Sectoral scope 14 on November 10th, 2011.

4.2 Deviations from the Monitoring Plan

Describe and justify any deviations from the monitoring plan in the project description.

The following deviations were listed in the previous VCS monitoring plan for m_2, and will be listed here to carry forward every deviation made from the PD for the lifetime of the Project. The deviations listed below were accepted during the m_2 verification:

m_1 Deviations
There were no deviations in the first monitoring period

m_2 Deviations
There is one change from the parameters described in the Project Description. The parameter $\delta_{LE}, \hat{\delta}_{LE}$ was listed in the PD with a value of 0.4498, it was subsequently discovered that the equation was incorrect and with the corrected equation the parameter was recalculated at -0.564. There have been no other major deviations from the monitoring plan described in the PD, section 13 Monitoring, or in the monitoring standard operating procedure documents: 'Standard Operating Procedure - Biomass' and 'Standard Operating Procedure - Soils'.

The plot sampling team has been expanded to 13 members, and the biomass monitoring team is now fully implemented and operational, with a manager, Mwangi Githiru, a Biomass Monitoring center and 3 full-time members as well as seasonal interviewers.

m_3 Deviations
There is one change from the parameters described in the Project Description. In the first year of the Project 5 leakage plots were moved, however in this monitoring period it was discovered that due to an over-site the leakage model had not been updated to reflect the new plot values. With this update the parameter $\delta_{LE}, \hat{\delta}_{LE}$ has changed from -0.564 to -0.762.

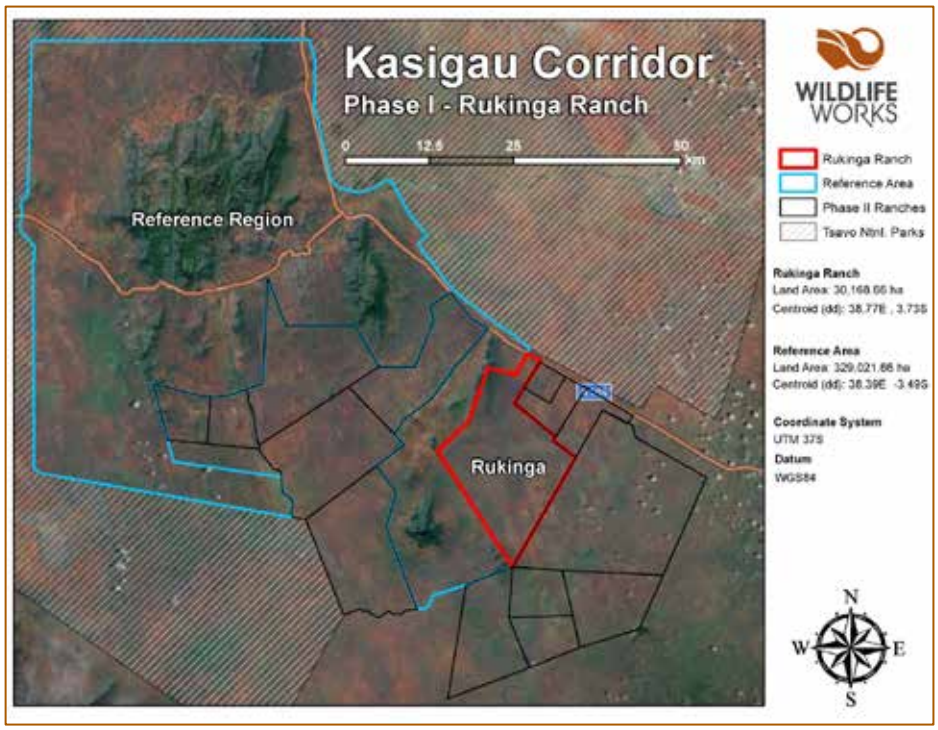
4.3 Project Boundary (G1)

Define the VCS project boundary and identify the relevant GHG sources, sinks and reservoirs for the project and baseline scenarios (including leakage if applicable).

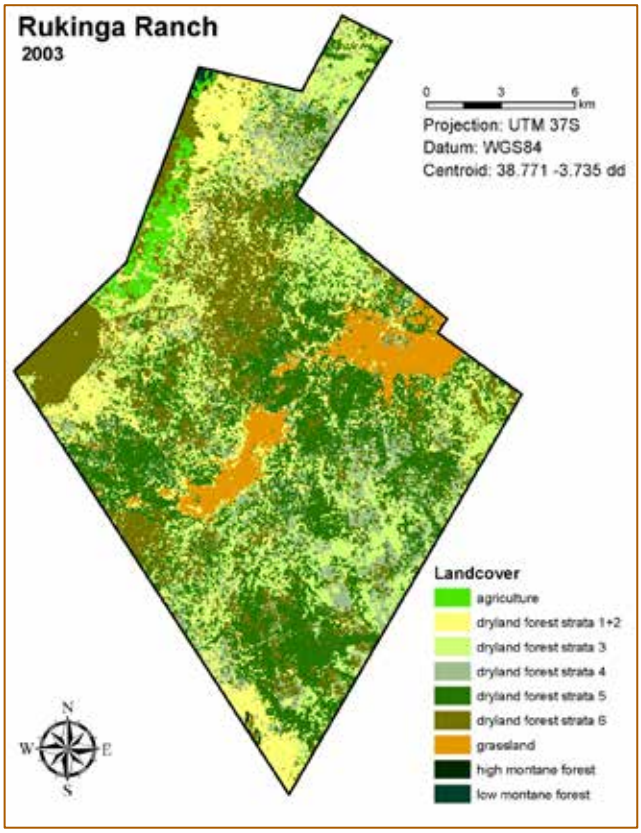
Kasigau Corridor Phase I - Rukinga Sanctuary

The Phase I Project covers 100% of the land known as Rukinga Sanctuary (see map below). The land has previously been used as a cattle ranch under the name of Rukinga Ranch, LR 12263. The original land tract was historically reduced by the subdivisions 12263/1 and 12263/2, these were divided prior to the start date of the Project. The total area covers 30,168.66 ha (74,516 acres).

The Project land conforms to the latest VCS definition of forest, with an average canopy cover of 39%, and mature tree height of 5–10 m. The Project Area has been primary forest since historic times. A GIS database with canopy measurements for Rukinga Ranch is available upon request.



Kasigau Corridor Phase I – Rukinga Ranch REDD Project and Reference Region Spatial Boundaries



Kasigau Corridor Phase I – Rukinga Ranch REDD Project landcover Map, Classified from *Landsat 7 ETM+ Acquired February , 2003*

The following table shows the landcover strata for Rukinga Ranch and their respective areas. Strata sum to the total area for the Ranch, 30,168.66 ha.

Landcover Strata area included in the Kasigau Phase I Project Area

Stratum	Area (ha)
ag active	713.7
dryland forest strata 1+2	6,883.6
dryland forest strata 3	5,651.1
dryland forest strata 4	2,773.4
dryland forest strata 5	8,133.4
dryland forest strata 6	4,345.5
Grassland	1,610.9
montane forest	570.6
Total area:	**30,168.66**

For additional maps and detailed geographic information, please refer to Section 1.2 of this Document and the CCB PDD Section G1.1 / VCS PD Section 5.1.

Major carbon pools included in the Kasigau Phase II Baseline Scenario and Project Scenario

Source		Gas	Included?	Justification/Explanation
Baseline	Above-ground Large Trees (AGLT)	CO_2	X	Major Baseline Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
	Below-ground Large Trees (BGLT)	CO_2	X	Major Baseline Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		
	Above-ground Non-tree /shrubs (AGNT)	CO_2	X	Major Baseline Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
	Below-ground Non-tree /shrubs (BGNT)	CO_2	X	Major Baseline Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
Project	Above-ground Large Trees (AGLT)	CO_2	X	Major Project Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
	Below-ground Large Trees (BGLT)	CO_2	X	Major Project Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
	Above-ground Non-tree /shrubs (AGNT)	CO_2	X	Major Project Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		De minimis
	Below-ground Non-tree /shrubs	CO_2	X	Major Project Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis

	(BGNT)	Other		De minimis

4.4 Baseline Scenario (G2)

Identify and justify the baseline scenario.

Include a description of how the most likely land use scenario associated with the baseline scenario would affect communities and biodiversity in the project zone (see G2.1 & G.2.4-5).

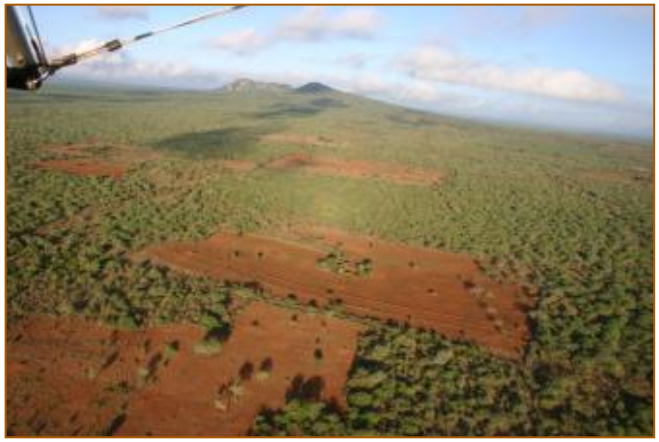
Unlike with many REDD projects, it was not difficult to identify the baseline scenario for this project: rapid deforestation due to unplanned slash and burn agricultural expansion by subsistence immigrants at the frontier of human expansion. Virtually all the conditions of the baseline were in place before the arrival of Wildlife Works. There is little need for speculation as to what would happen in the absence of the Project if protection ceased, and the presentation of alternative livelihoods for the community wasn't continued along its successful pattern: the mosaic pattern of deforestation would (and has before the Project) certainly expand into the Project Area.

Aggressive cutting of trees (see picture below) for the production of unsustainable charcoal is also another source of land use in the area. The income derived from this activity however will only benefit a few, whilst being detrimental to the broader land area and community. This activity was widespread across the Project Area upon Wildlife Works arrival on the scene, and is in fact a very serious problem throughout East Africa. The result of such practices is a thoroughly degraded forest. Because charcoal makers target the hardest wood (it makes better charcoal because it burns hotter and longer), only softwood is left, containing minimal carbon content. Therefore, illegal charcoal practices not only hurt the environment, but also lower carbon values and therefore potential benefits for carbon project stakeholders. The Project has successfully quelled most of the illegal project activity and aims to keep up efforts to do so throughout the project lifetime.



Non-Sustainable Charcoal Kiln used to create "bush-charcoal"





Typical deforested area in the Kasigau Corridor reference region. View from the ground and from the air.

Baseline Effect on Communities

As the Project Area is such an arid ecosystem, most likely deforestation would not lead to an increased deterioration of local climatic conidtions, in terms of even lower rainfall and/or increased mean temperature. However, it would be expected that soil erosion, soil carbon and soil fertility losses would all most likely increase. What is more, we have demonstrated over the past ten years our commitment to the economic wellbeing of the community. This is demonstrated by our direct employment of community members, who make up over 90% of our permanent Kenyan staff of over 277. In addition we have brought other income generating ecofriendly activities to the Project Zone, including ecotourism as well as other employers (e.g. SOKO factory in the EPZ). Furthermore, we have built schools, trained local people in better dryland farming techniques and provided resources to health clinics. We plan to expand these benefits with the additional financing that the carbon project will provide.

Baseline Effect on Biodiversity

It is not hard to estimate the Baseline or without-project-scenario and its effect on biodiversity. At the time when Wildlife Works entered the Project Area, wildlife numbers were very low, due to having being poached for bushmeat. Since active conservation activities began, these numbers have recovered and animals have returned. There is now a vibrant balanced ecosystem once

again. Nevertheless, in the Baseline it is likely that there would be no or insignificant wildlife residing in the Project Zone.

Furthermore, our general conservation influence on the community has lead to community based conservation initiatives in community trust lands, and community supported de-snaring activities in the National Parks themselves. It has as well as lead to new less violent means of dealing with wildlife conflict. Bushmeat poachers are still regularly caught on the Project Area by the Rangers. These often are commercial hunters often from outside the Project Zone coming to harvest bushmeat for transport back to the cities. As such, the baseline scenario would suggest that rampant poaching would continue without any effort of regulation. Finally, as the dryland acacia-commiphora forests grow and regenerate very slowly, any loss of trees or deforestation under the baseline would likely result in a permanent change in ecosystem.

4.5 Additionality (G2)

Demonstrate and assess the additionality of the project, undertaken in accordance with the applied methodology.

Within the Project Area, none of the proposed Project Activities violate any law.

a) Identification of alternative land use scenarios
   a. Continuation of the pre-project land use as private wildlife sanctuary:

   Prior to the implementation of the REDD project on Rukinga, the Project Proponents had spent a significant and unsustainable amount of money over the last ten years financing activities to attempt to protect the forest from destruction. Those activities provided no significant sources of income from the land to offset the land protection costs, and therefore this project would eventually have failed financially if carbon funding were not made available.

   b. Uses in the ten years prior to Project start date:

   Cattle Ranching - When the current majority landowners acquired their interest in Rukinga Sanctuary in 2000, the previous owners were operating a financially unsuccessful cattle ranching operation on the land. With severe water shortages in the area however, it was too dry for successful cattle ranching. Predation by lions on the cattle was also a problem. As a result the operation failed financially, which lead to the eventual sale of the land to the majority shareholder of Wildlife Works.

   Ecotourism - The prior owners also operated an ecotourism facility on the Project Area (now known as Camp Tsavo). However, the facility struggled to be financial viable, and with the increasing threat of slash and burn clearing, which at one point had encroached as close as 200m, this operation failed entirely.

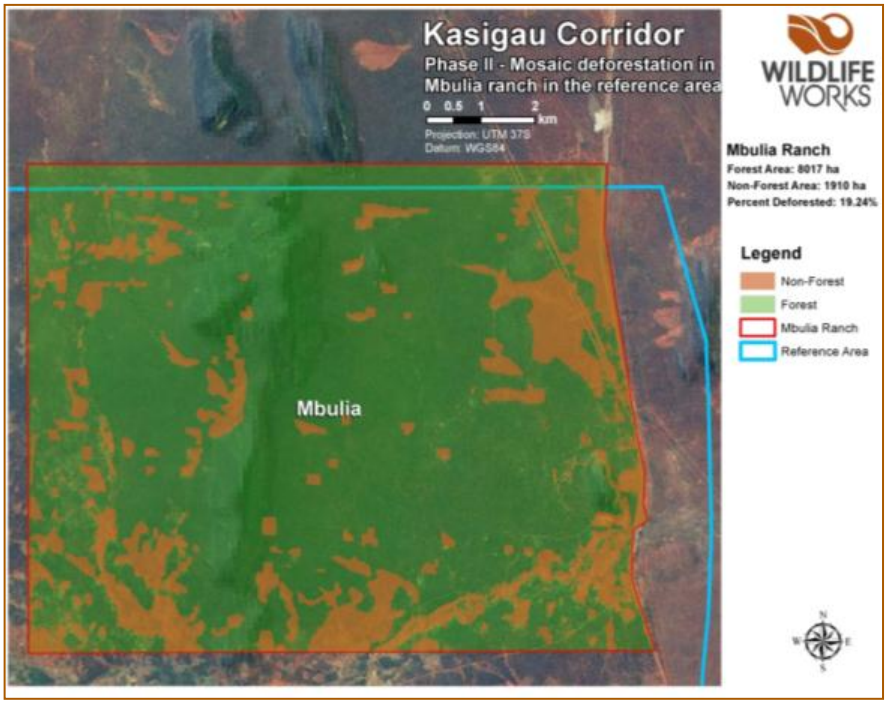
   c. Slash and Burn Agriculture by subsistence farmers:

   Prior to the Project Proponent taking over management of the land in 2005, local people had begun to clear part of the Project Area. Additionally, they had systematically cleared the dryland forest from a majority of the Project Reference Area in order to provide land for annual crops.

This is evidently the most likely Baseline scenario, as it had been carried out routinely throughout the Reference region, in clear violation of land laws.

b) Consistency of credible land uses with enforced mandatory laws and regulations:

All of the alternative land use scenarios above represent legal land uses, with the exception of slash and burn agriculture. This essentially consists of squatting on privately owned land, which is illegal under Kenyan law. However, there is overwhelming evidence that this law had been largely unenforced, as more than 30% of the area of the administrative unit that encompasses the Project Area had been deforested in the ten years prior to the project start date. Thus, all the land uses above are credible.



Mbulia Ranch in the Kasigau Corridor Reference Area

c) Investment Analysis – Simple Cost Analysis:

Physical protection of the Project Area as well as provision of deforestation mitigation activities cost the Project Proponent approximately $300,000 - $400,000 per year in the years prior to implementation of the VCS REDD+ project. The mitigation activities included classroom construction, bursary schemes, reforestation and security and ranger patrols for the community. There exists no significant income to offset these costs. In the absence of active protection, both physical and that created by partnering with the communities to create economic alternatives, it is clear the land in the Project Area would be cleared aggressively for subsistence agriculture, as that was in fact what was already happening prior to our arrival. Slash and burn agriculture faces no economic barriers, and is therefore once again the most likely Baseline scenario.

d) Common Practice Analysis

It is common practice to protect wilderness in Africa, and to provide sustainable development support for rural African communities. However, the funding for these activities is typically from governments or donor agencies as opposed to by a financial return derived from the Project Activities. It is NOT common practice for private companies that are not donor funded, such as the Project Proponent to protect forested wilderness in Africa for financial return, in the absence of AFOLU revenues. The Project Proponent's Rukinga Sanctuary project was the first AFOLU and REDD+ project activity of its type in Kenya, and one of the very first in Africa.

Summary of Additionality Test

In summary:

- The Kasigau Corridor Phase I REDD Project is not the only credible alternative land use consistent with enforced mandatory applicable laws,
- One of those alternative land uses, that of slash and burn agriculture, is by far the most likely baseline land use,
- The Kasigau Corridor REDD+ project passes the Investment Analysis Test, as it is not a financially viable land use without the AFOLU VCS project revenues
- The Project Activities are NOT common practice.

Therefore, the Kasigau Corridor Phase I – Rukinga Sanctuary is additional under the rules of VT0001 Tool for the Demonstration of Additionality in VCS AFOLU Project Activities.

Include a justification that community and biodiversity benefits would not have occurred in the absence of the project (see G2.2).

Protecting this 30,168.66 ha piece of dryland forest has cost the Project Proponents a significant amount of money over the last ten years. There are no significant sources of income from the land to offset those protection costs, and therefore this project would eventually fail financially if carbon funding were not made available. In the absence of active protection, both physical and that through partnering with the communities to create economic alternatives, it is clear the land in the Project Area would be cleared aggressively for subsistence agriculture. As this was the case prior to the arrival of Wildlife Works.

The local agents of deforestation in our Project Area are the Taita people who have traditionally farmed the fertile cloud forested hills of the Eastern Arc Mountains, Mt. Kasigau and the Taita Hills. As their population exceeded the carrying capacity of the land on the hills they moved down into the dryland acacia-commiphora forest that dominates the lower elevations of the district. However, in this new ecosystem their traditional farming practices did not work, due to extremely low average rainfall. Consequently, after first colonizing all the land with permanent water sources they began to clear any available unprotected land.

The larger blocks of remaining land in the area outside of the communally owned land, which is protected by local administrations, were privately held group ranches designated as cattle carrying areas for the communities of the hills in the 1970s. Due to the remoteness of these areas and the lack of permanent water sources, they had never been developed as cattle ranches, and remained as natural forest. However, in the mid 1990s a population boom occurred, fueled both by the rainfall patterns and the improvement of the main Mombasa highway and a local arterial

road that runs along the edge of the Rukinga Project Area.

A second group of agents of deforestation in our Project Area are the Duruma, coming from over one hundred kilometers away in Coast province. They are historically a very poor tribe that opportunistically and illegally sought farmland that was unprotected throughout Kenya. The Duruma people arrived in the Project Area the early 1990s, as a result of a corrupt politician who promised them land (that was not owned by him) in return for votes. As the families realized they could find unprotected land in the district, more and more families came.

Both these populations began aggressively converting land in the late 1990s, just prior the arrival of Wildlife Works on the scene in 1999. Shortly after Mike Korchinsky funded the first ranch, called Rukinga, and Wildlife Works began to protect the land in 2005, the immigration slowed, and in fact some families returned to the coast.

m_3 Updates
As of the third monitoring period, The Kasigau Corridor Projects remain in disbursement mode, and the owners of Rukinga ranch and communities continue receiving regular distributions. Wildlife Works has successfully sold all credits from the 2010, with hopes to sell the remaining 2011 and 2012 vintage at a premium. This will allow the continuation of support to the communities through the Project Activities described in this document. Many Project Activities are in full swing, and many Project Area community members being directly employed by Wildlife Works at this juncture. Wildlife Works have made great strides towards creating alternatives to slash and burn agricultural practices and illegal charcoal production through job creation. The core Project Activities show no sign of slowing down during this monitoring period.

5 MONITORING DATA AND PARAMETERS

5.1 Description of the Monitoring Plan (CL3, CM3 & B3)

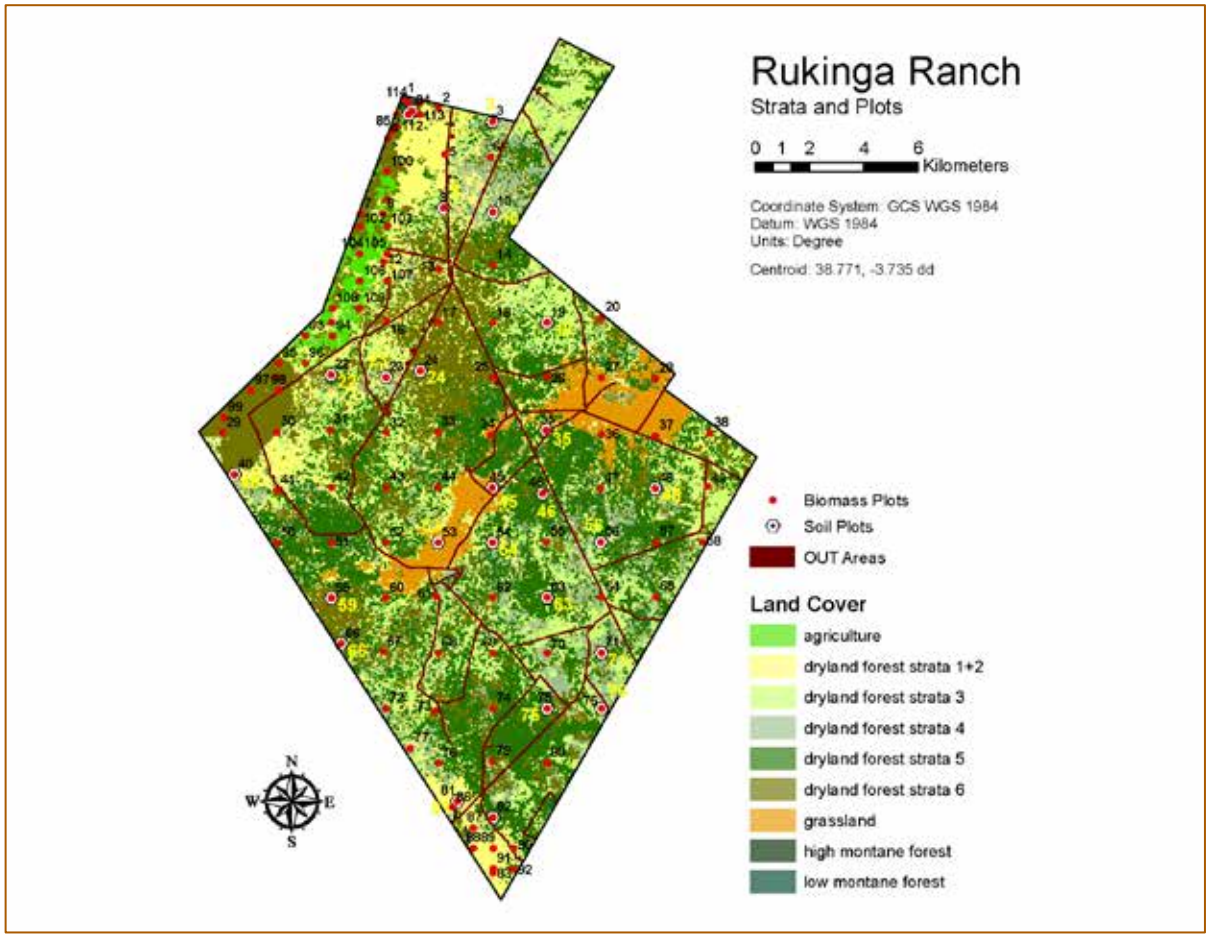
Describe the implementation of the monitoring plan.

- *Identify organizational structure, responsibilities and competencies.*
- *Describe methods for generating, recording, storing, aggregating, collating and reporting data on monitored parameters.*
- *Describe procedures for handling internal auditing and non-conformities.*

Line diagrams may be used to display the data collection and management system.

The following is an overview of the monitoring plan, a detailed rendition of which can be found in the PD under Section 13.14 *Monitoring of Carbon Stocks in the Project Area* (the field procedures are detailed in the documents ‘Standard Operating Procedure - Biomass’ and ‘Standard Operating Procedure – Soils’).

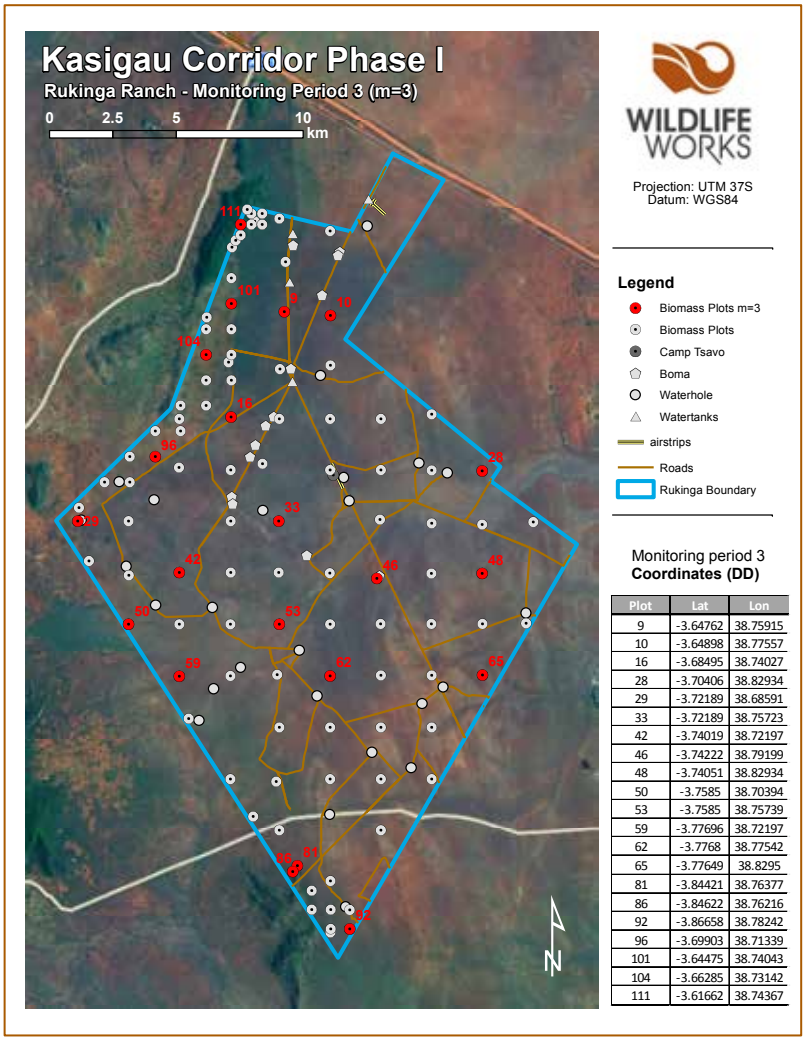
In order to most accurately estimate biomass in the Phase I Project Area, with reasonable time and expense, we divided the area into 9 landcover strata based on ecosystem type. This was done as there exists a high perceived variation in average biomass across the 8 forest strata, with larger trees in high density in the dense montane forest stratum, medium to large trees and lots of shrubs in the middle dryland forest strata and scattered trees, very few shrubs and heavy grass cover in the grassland / sparse stratum. An additional stratum was created that encompasses all of the roads and developed areas in the Project Area. Overall, the 9 strata sum to the total project land area, depicting overall the landcover in the Phase I Project Area:



The Kasigau Corridor REDD Project Phase I – The Rukinga Sanctuary landcover strata and biomass and soil plot locations.

Biomass plot sampling was conducted throughout the monitoring period under the supervision of Wildlife Works VP Carbon Development Jeremy Freund and VP African Field Operations Rob Dodson. All plot sampling was conducted using the same successful, exacting protocol that was used for the first monitoring period for this project. Proper adherence to the updated SOP was ensured throughout the sampling process.

A total of 115 plots were placed in the Rukinga Sanctuary Project Area. 83 plots were placed utilizing a systematic sampling method to overlay a 2 km x 2 km grid over the sanctuary and select sample plot centers at the center point of each square. The upper left corner of the grid was randomly positioned to ensure the ultimate random nature of the individual plots. 32 plots were overlaid on the ranch in a stratified random pattern. The methods described in the Biomass SOP were used to collect a comprehensive forest inventory. It was determined that it was both redundant and too time consuming to monitor every plot each monitoring period, so the decision was made to monitor 100% of the plots every five years, thereby monitoring 20% of the plots (selected at random) each yearly monitoring period. For this monitoring period (m_3), 21 plots were measured across the Rukinga Sanctuary.



Plot	Lat	Lon
9	-3.64762	38.75915
10	-3.64898	38.77557
16	-3.68495	38.74027
28	-3.70406	38.82934
29	-3.72189	38.68591
33	-3.72189	38.75723
42	-3.74019	38.72197
46	-3.74222	38.79199
48	-3.74051	38.82934
50	-3.7585	38.70394
53	-3.7585	38.75739
59	-3.77696	38.72197
62	-3.7768	38.77542
65	-3.77649	38.8295
81	-3.84421	38.76377
86	-3.84622	38.76216
92	-3.86658	38.78242
96	-3.69903	38.71339
101	-3.64475	38.74043
104	-3.66285	38.73142
111	-3.61662	38.74367

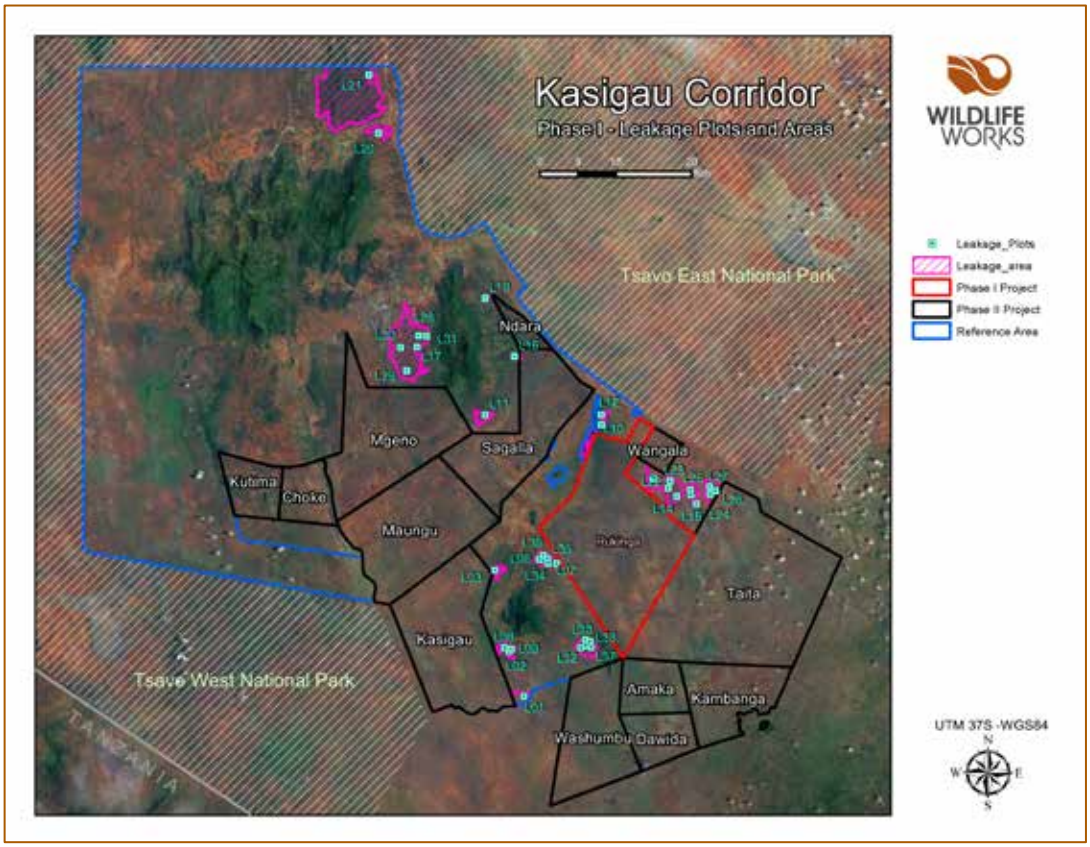
Biomass plots for m_3 – 20% of the 115 permanent plots are measured every monitoring period

Leakage plots are assessed differently than biomass plots. Although they are permanent, they are located in the leakage area, and necessarily placed in random spatial locations. They therefore cannot be conspicuously marked as are the biomass plots. The Northeast corner of each leakage plot is recorded in a GIS system, and the plot is evaluated by the leakage plot sampling team using two walking transects per plot. The teams were specially trained by Jamie Hendriksen, Wildlife Works' Operations Manager, to recognize and measure degradation due to charcoal burning and kilning, a phenomenon that is typical to this particular area.

The leakage assessment is a qualitative analysis based on the trained judgment of the team members to assign a leakage factor, an amount of forest degradation, to each plot. Two team members walk each plot, and their results are compared to get a leakage factor for each plot. Since this is a qualitative factor, dependent on the personal assessment of plot team members, the cumulative leakage factor reported for a plot could conceivably decrease from one year to the next. This could be due to a difference in plot team member judgment, time of day of measurement, or the forest degradation state of plots measured previously in the day. If the reported leakage factor of a plot is more than 2 bins lower than the previous years reported factor, then the previous year's factor will be used. If more than 10% of leakage plots have a

reported leakage factor more than 2 bins lower than the previous year's factor than these leakage plots will be remeasured.

A detailed rendition of the degradation estimation procedure is listed in Standard Operating Procedure - Leakage provided to the validators.



Leakage plot locations for Kasigau Corridor Phase I Project.

Organizational Structure

Wildlife Works has 2 dedicated plot sampling teams, with each team containing 8 sampling specialists. The teams are under the supervision of Rob Dodson, VP of African Field Operations. Each team is directed by a team leader, who is trained in GPS operation and forest sampling techniques. The team leader must additionally demonstrate proficiency in species identification and biometric estimation techniques (calculating DBH, height, measuring angle from north, etc.). These team leads have typically grown into their position with experience and proven acumen in the field, and this position is coveted within the Wildlife Works hierarchy. The overall team leader is Joel Mwadigha, while each team also has an operation leader: Joshua Kitiro and Mattias Kakoi. Collectively, these three are responsible for all data collection and its transfer to the main Rukinga office. Their names are attached to each and every soil, leakage and biomass plot data sheet. All discrepancies can be easily traced back to date and time of collection, as well as team members who collected the data. In an effort to minimize any conflict between team members, or complacency in their job, plot team members continuously change jobs, and the team members are mixed between teams.

As mentioned above, leakage plot teams are specially trained by the VP African Field Ops and the Operations Manager to recognize the specific type of forest degradation typical of the Kasigau Corridor. An internal audit was conducted prior to project validation to ensure consistent measurement techniques; such an audit will be carried out every monitoring period. Additionally, at each monitoring period 20% of the measured plots are remeasured by a different plot team as part of the QA/QC process.

Data Collection, Storage and Aggregation
Data collected in the field is systematically translated into the carbon model developed by Jeremy Freund, VP of Carbon Development. The carbon model contains dropdown lists and pre-filled formulas to ensure accuracy of entry and minimize human translation error. Data for this monitoring period were entered by Defence Mghoi, who was been trained by Rob Dodson, the VP of African Field Ops. Data entry is crosschecked internally, as well as by staff in the US office. The data goes through a final check by the U.S. based carbon development staff, where any outlying or otherwise inconsistent or unusual data is analyzed.

Carbon model aggregation is ultimately the responsibility of the VP of Carbon Development, and all Carbon accounting procedures were developed by him, and adhere to the VCS methodology. Digital copies of all data and models are maintained at Wildlife Works' San Francisco office.

Field Training
The standard operating procedures (SOP) for biomass and soils were produced using the experiences and expertise of field techniques by the initial plot sampling team. Whenever necessary, the biomass and soil sampling SOPs are revised to encompass new techniques, methods or metrics. Two teams have been trained using this procedure, and undergo several checks to ensure consistency in method. Before each monitoring event, plot teams undergo field training from Mwangi Githiru and Jamie Hendrickson to refresh their knowledge and incorporate any additions to the SOP.

Internal Auditing
Internal checks are routinely performed on biomass, soil and leakage plots. The VP of Carbon Development, VP of African Field Operations and Operations Manager routinely embark on "check cruises" to evaluate the employees' work, and often, management will audit individual measurements. Wildlife Works has also instituted an official Quality Assurance and Quality Control system for biomass plots, which has been reviewed by the validators (see QA/QC Standard Operation Procedure). As mentioned above, once the data is translated into electronic format, various internal checks are performed to eliminate errors. Wildlife Works management continually reviews the work done by other members of management to ensure there are no outlying data or unexplained inconsistencies. It is the policy of Wildlife Works that all work products shall be internally reviewed by a second person before publication.

- *Describe monitoring and reporting frequency, and plans for publication and dissemination to the communities and other stakeholders (see CL3, CM3 & B3).*

The following is a summary of the plans to monitor Climate, Community and Biodiversity (CCB) impacts on the environment as a result of the carbon Project's direct influence. For a detailed monitoring plan please refer to the CCB Project Monitoring Plan (PMP), which was provided to the CCB validation auditors at the time of project validation. Please also refer to Sections CL3, CM3 and B3 for Climate, Community and Biodiversity monitoring plans, respectively, in the

Project's CCB PDD.

Climate Monitoring

As this project seeks full CCB/VCS accreditation, all climate monitoring is assumed to fall under the VCS monitoring plan, which is fully described in the Project Monitoring Plan sections above, and also in the Project's VCS PD Section 13.14 *Monitoring of Carbon Stocks in the Project Area.* Additional specific monitoring information can be found in the Standard Operating Procedures for Biomass, Soil and Leakage. All of the aforementioned documents were made available for review by the validation/verification team.

The following Carbon Pools will be monitored, as specified under the VCS methodology *VM0009 Methodology for Avoided Deforestation of Tropical Forests V1.1:*

Pool	Required	Included in Project?	Justification
Above-ground large tree biomass	Yes	Yes	Major pool considered
Above-ground small tree biomass	Yes	Yes	Major pool considered
Above-ground non-tree biomass	Optional	Yes	Major pool considered
Below-ground large tree biomass	Optional	Yes	Major pool considered
Below-ground small tree biomass	Optional	Yes	Major pool considered
Below-ground non-tree biomass	Optional	Yes	Major pool considered
Litter	No	No	Conservatively excluded
Standing dead wood	Optional	Yes	Major pool considered
Lying dead wood	Optional	No	Conservatively excluded
Soil	Optional	Yes	Major pool considered
Long-lived wood products	Yes	Yes	May be a significant reservoir under the baseline scenario

The purpose of the carbon-monitoring plan is to ensure:

- That the Project has protected the dryland forest within the Project Area from any unplanned GHG emissions during the project crediting period, and;
- That no identifiable leakage has occurred that can be attributed to this project.

Emissions reductions calculations were based on two models, both according to the VCS methodology VM0009. The first is a current carbon inventory of the Project Area, conducted using a stratified-random, fixed permanent plot methodology, which is accepted as a more accurate method for forest carbon inventory than remote sensing. The second model is based on satellite imagery covering a period of 20 years prior to the beginning of the Project, clearly and empirically demonstrating the deforestation rate in the Project Area.

For the first model, we carry out annual resampling of 20% of the total number of permanent plots originally created for the forest inventory. The plot sampling is normally performed at the same time of year as the initial inventory to ensure minimum seasonal variability in carbon stocks, which in southeastern Kenya can be considerable. We re-measure the diameter at breast height (dbh), height, and status of each tree for each plot. Annual resampling is rotated such that every five years we have performed a complete (100%) resampling of the forest biomass plots. We will also fund the external auditors of our project to verify our sampling plan on an annual basis.

Soil carbon is monitored once every five years. We monitor this pool less regularly as soil carbon content changes on a much slower timeframe than biomass. It is additionally very difficult and expensive to collect the number of soil samples needed to run our very robust soil carbon model. The methodology employs a soil carbon decay model, which estimates the release of carbon from soil after being converted from forested land to cropland. This soil model, accepted at the validation of this project, does not require yearly re-measurement of each soil carbon plot to maintain an accurate depiction of soil carbon behavior.

Disturbance Monitoring
We have developed a monitoring system and plan for disturbances, reversals, catastrophic events and any other potential large negative effect on carbon levels within the Project. This system is described as follows.

Identification of Disturbances
In order to quickly identify disturbances in the Project Area resulting from natural events (e.g., fires) or encroachment, the Project Proponent performs the following monitoring activities:

a) Forest ranger patrols and community scouts: Regular patrols of the Project Area are carried out in order to detect encroachment or other disturbance. In addition, designated ‘community scouts’ have been instructed to notify the Project Proponent when they observe newly disturbed areas within the Project Area.

b) Analysis of imagery: Analysts periodically examine one or more imagery products in order to detect encroachment or other disturbance. Imagery products may include Landsat, MODIS, FEWS NET, Google Earth imagery, or aerial imagery or videography collected by the Project Proponent.

Frequency of Disturbance Monitoring
In addition to the regular forest patrols, Project Proponents use aerial imagery each year in order to quickly and accurately identify potential disturbances within the Project Area.

Definition of a Significant Disturbance
A disturbance is considered significant if:
The disturbed area is greater than 250 ha, or the disturbance results in a decrease in carbon stock estimates (tCO_2e/ha) of greater than 5%. The magnitude of the change in carbon stocks shall be determined by comparing the carbon stock estimates of the disturbed area’s stratum prior to disturbance with the results of a pilot sample of approximately 5 plots in the disturbed area.

Accounting of Disturbances

If a disturbance is determined to be significant according to the criteria listed above, the Project Proponent shall do the following:

a) Delineate a new stratum for the disturbed area. This delineation can be performed in the field using a GPS or using a remote sensing product.

b) Install plots and re-measure above- and below-ground biomass.

c) Determine new Project Area carbon stocks with the new stratum included.

Community Monitoring

Wildlife Works gathers data relevant to community impact in a variety of ways and at a range of frequencies. At one end of the spectrum is human population data for the Project Reference Area are gathered every ten years from Kenya's national census data. At the finer scale, Dr. Mwangi Githiru conducts annual household surveys amongst the communities in the Project Area. The focus of these surveys is to collect vital data on population, household size and composition and livelihoods. This household survey is described in detail above in Section 2.2.14.8. To collect suggestions and grievances from communities in the Project Zone 5 suggestion boxes have been placed village chief offices.

Sales and production data are collected by each of the Project Activities, such as the nursery operations, and reported to the main office at Rukinga. This information is then reported annually in this report as metrics of their success. Employment, both permanent and temporary, is tracked by the HR department and reported annually in this report.

As mentioned above in the Climate Impact Monitoring section, Wildlife Works will conduct verifications annually against the VCS and CCB standards. Therefore, once a year, we summarize all of the data collected and include that summary in the CCB and VCS Verification reports for each monitoring period.

Biodiversity Monitoring

Wildlife Works has been gathering data on wildlife populations for over 10 years. Dr. Mwangi Githiru continues to function as Wildlife Works' Biodiversity and Social Monitoring Director. He is in charge of the Biodiversity team, whose role is to gather, verify, analyze and report key biodiversity indicators. Additional biodiversity data is collected by the forest rangers, who record the location of HCV wildlife and other points of interest throughout their daily activities. The goal is to demonstrate that the Project is delivering on the stated commitment to improving the situation of the HCV species present in the Project Area. All of the biodiversity data that is collected is managed and analyzed by Dr. Githiru and his team at the Rukinga Sanctuary. Dr. Githiru produces a robust Biodiversity and Social Monitoring Report yearly. The data and biodiversity trends seen are also summarized annually in this report (see section 2.2.14).

5.2 Data and Parameters Available at Validation (CL3)

Describe data and parameters available at validation using the following table (copy table for each data unit/parameter (see CL3.1).

The following data parameters were available at the point of project validation. These include data for the baseline (without-project scenario) and project carbon pools (soil and forest). Please

refer to section 5.1 of this document for more detailed information about the monitoring plan for net-positive climate influence from the Project. None of the variables in this section change with each monitoring period and are thus not periodically monitored. They are, however, used extensively in all sections of the Project, and are reported within each Monitoring & Implementation Report.

Data Unit / Parameter:	$\delta_{LE}, \hat{\delta}_{LE}$
Data unit:	Time
Description:	Lag parameter of leakage model.
Source of data:	The parameter is estimated from the observed cumulative forest degradation and deforestation, $\hat{d}_t$, observed at the beginning of the Project, t_0. This proportion is observed using a sample of plots in the leakage area, and the parameter is calculated using equation 9.
Value applied:	-0.762
Purpose of the data:	To produce a parameterized leakage model that can be used to predict cumulative deforestation and degradation at any point in time.
Any comment:	

Data Unit / Parameter:	$\hat{\eta}$
Data unit:	Real
Description:	Estimated linear predictor of cumulative deforestation model.
Source of data:	Calculated using Equation 7. Equation 7 is fit using historic observations of forest state in the reference area.
Value applied:	0.031649
Purpose of the data:	The linear predictor is used to predict the future degree of forestation in the Project Area at any point in time after the project start date.
Any comment:	

Data Unit / Parameter:	$\hat{\lambda}$
Data unit:	Proportion
Description:	Exponential soil carbon decay parameter
Source of data:	Calculated using empirically measured, project specific data.
Value applied:	0.55

Purpose of the data:	To predict the decay of soil organic matter in the Project Area under the project scenario.
Any comment:	

Data Unit / Parameter:	ρ_{sp}
Data unit:	$\mathrm{kg} \cdot \mathrm{m}^{-3}$
Description:	Wood density of species sp.
Source of data:	Literature
Value applied:	0.24
Purpose of the data:	Value is used as the wood density of standing dead wood with decay class of II. It converts the calculated wood volume to biomass.
Any comment:	Value was taken from: Harmon, Woodall, Fasth, Sexton and Yatkov. 2011. Differences between standing and downed dead tree wood density reduction factors: A comparison across decay classes and tree species. Research Paper NRS-15. Newton Square, PA. U.S. Department of Agriculture, Forest Service, Northern Research Station.

Data Unit / Parameter:	$\hat{\sigma}_{DF}$
Data unit:	Standard Deviation
Description:	The estimated standard deviation of the state observations used to fit the cumulative deforestation model.
Source of data:	Value calculated from the point observations in the cumulative deforestation model using Equation 17.
Value applied:	0.3127
Purpose of the data:	Used to determine the uncertainty in the cumulative deforestation model and number of leakage plots required.
Any comment:	

Data Unit / Parameter:	$a_{project}$
Data unit:	Hectares (ha)
Description:	Total Project Area
Source of data:	Measured using GIS analysis and from the land deed.
Value applied:	30,168.66
Purpose of the data:	Total Project Area used for determining total

	carbon quantities from inventory.
Any comment:	

Data Unit / Parameter:	a_{LE}
Data unit:	Hectares (ha)
Description:	Total leakage area.
Source of data:	Measured using GIS analysis.
Value applied:	30,168.66
Purpose of the data:	Used to define the area within which plots are established to measure any potential leakage from the Project Area.
Any comment:	

Data Unit / Parameter:	cf_{sp}
Data unit:	$\mathrm{t\ C \cdot t.\ d.\ m.^{-1}}$
Description:	Carbon fraction of dry matter for dead wood.
Source of data:	In cases where an adequate value is not available from peer-reviewed literature, the methodology calls for the IPCC default value of 0.5 to be used. In this project the IPCC default was used
Value applied:	0.5
Purpose of the data:	Used to convert the calculated total dry biomass of wood to carbon for each tree measured.
Any comment:	

Data Unit / Parameter:	$d_{j,k}$
Data unit:	Meters (m)
Description:	Depth of soil sample in plot j in stratum k.
Source of data:	Measured, defined in the Soil carbon SOP "Standard Operating Procedure Kasigau - Soil v1.0_5_24_2011.pdf"
Value applied:	1
Purpose of the data:	Used in the soil carbon model for estimating total soil carbon quantities.
Any comment:	

Data Unit / Parameter:	$f_{sp}(\cdot)$

Data unit:	Function
Description:	Allometric equation for species sp.
Source of data:	Derived from destructive sampling of trees in the same region of the Project.
Value applied:	Please see section 5.1, List of Allometric Equations for a table displaying the species-specific allometric equations used in the carbon analysis.
Purpose of the data:	Used for calculating tree biomass.
Any comment:	

Data Unit / Parameter:	$\hat{\ell}_{max}$
Data unit:	Proportion
Description:	The estimated maximum proportion of soil carbon lost over time.
Source of data:	Measured and calculated by quantifying soil carbon in cultivated areas within the reference area where the time of deforestation is known. The mean soil content from these measurements is then divided by the mean soil carbon measured within the Project Area.
Value applied:	0.4557
Purpose of the data:	Used to determine the proportion of the total soil carbon in the Project Area that would be lost under the without-project deforestation scenario.
Any comment:	

Data Unit / Parameter:	$\hat{m}_{LE}$
Data unit:	Count
Description:	The sample size in the leakage area.
Source of data:	Equation 10 calculates the sample size of plots needed in the leakage area.
Value applied:	38
Purpose of the data:	To determine the number of sample plots needed to measure forest degradation and deforestation in the leakage area with the desired confidence levels.
Any comment:	

Data Unit / Parameter:	n_{SCL}
Data unit:	Count

Description:	The actual sample size used to estimate the maximum proportion of soil carbon loss.
Source of data:	Is equal to the variable $\mathcal{A}$, the set of all sampled farms in the reference area to estimate $\hat{\ell}_{max}$, the maximum proportion of soil carbon loss.
Value applied:	25
Purpose of the data:	Used in equation 19 to determine the uncertainty in the soil carbon loss model.
Any comment:	

Data Unit / Parameter:	p_{forest}
Data unit:	Proportion
Description:	The proportion of the Project Area that is forested.
Source of data:	Measured using GIS and remote sensing analysis.
Value applied:	0.92
Purpose of the data:	Used to determine the total amount of the Project Area that is forested. Used in equation 33.
Any comment:	

Data Unit / Parameter:	p_{BGLT}
Data unit:	Proportion
Description:	Proportion of below-ground large tree biomass removed as a result of land conversion to agriculture.
Source of data:	Default value from methodology based on the fact that Project Area would be converted to agriculture in without project scenario.
Value applied:	1
Purpose of the data:	Used in equation 24 to determine the baseline emissions in below-ground large tree biomass.
Any comment:	

Data Unit / Parameter:	r_{sp}
Data unit:	Unitless
Description:	Ratio of below-ground biomass to above-ground biomass (root to shoot ratio) for species sp.
Source of data:	Value taken from the IPCC Guidelines for National GHG Inventories, for AFOLU (2006), Table 4.4. Value is for Tropical Shrubland, the Ecological type

	of the Project Area as determined from FAO Africover landcover dataset.
Value applied:	0.4
Purpose of the data:	Used in Equation 64 to estimate the belowground carbon stock in non-trees and trees from the above ground measured component.
Any comment:	

Data Unit / Parameter:	r_{WP}
Data unit:	Proportion
Description:	Proportion of above-ground large tree biomass converted to long-lived wood products.
Source of data:	Expert local knowledge or peer reviewed literature.
Value applied:	0
Purpose of the data:	To account for carbon stored in biomass from the Project Area that is converted to long-lived wood products during any monitoring period.
Any comment:	

Data Unit / Parameter:	x
Data unit:	Real, vector
Description:	Vector of observed covariates to deforestation.
Source of data:	Independent variable used in the disforestation model, derived from expert local knowledge or peer-reviewed literature.
Value applied:	0
Purpose of the data:	Used in the parameterization of Equation 7, the linear predictor of deforestation, part of the logistic deforestation model.
Any comment:	

Data Unit / Parameter:	U_{DF}
Data unit:	Percent
Description:	Estimated uncertainty in the cumulative deforestation model.
Source of data:	Calculated from Equation 15.
Value applied:	5.9
Purpose of the data:	Used in Equation 36 to determine the average uncertainty in carbon stocks and the baseline model at monitoring period $[m]$.

Any comment:	

Data Unit / Parameter:	U_{SCL}
Data unit:	Percent
Description:	Estimated uncertainty in the soil carbon loss model.
Source of data:	Calculated from Equation 19.
Value applied:	13.9
Purpose of the data:	Used in Equation 36 to determine the average uncertainty in carbon stocks and the baseline model at monitoring period [m].
Any comment:	

Data Unit / Parameter:	–
Data unit:	Percent
Description:	Moisture content of Tree green biomass.
Source of data:	Measured on site by cutting discs from destructively harvested trees. The value was calculated by the difference of the disc's green mass and its dry mass.
Value applied:	50
Purpose of the data:	To convert the green weight of tree biomass as calculated by the allometry to dry tree biomass.
Any comment:	

Data Unit / Parameter:	–
Data unit:	Percent
Description:	Moisture content of Shrub green biomass.
Source of data:	Value was derived from the literature for African woody plants, based on moisture content at the Genus level for the primary shrub species. The source document is Simpson, William T., 1996. "Method to Estimate Dry-Kiln Schedules and Species Groupings: Tropical and Temperate Hardwoods." Research Paper FPL-RP-548. Madison, WI: United States Department of Agriculture, Forest Service, Forest Products Laboratory.
Value applied:	45
Purpose of the data:	To convert the green weight of shrub biomass as calculated to dry shrub biomass.

Any comment:	

5.3 Data and Parameters Monitored (CL3, CM3 & B3)

Describe data and parameters monitored subsequent to validation using the following table (copy table for each data unit/parameter) (see CL3). Include parameters for assessing anticipated and actual impacts (positive and negative) on communities and biodiversity resulting from the project activities (see CM3 & B3).

The following data and parameters were monitored during this period (m_3) subsequent to project verification. These include project carbon pools (biomass) and leakage. Baseline data is only measured at the point of baseline-reevaluation, and soil data is measured once every 5 years. Those pools are therefore not measured during this monitoring period. Values for those parameters were measured at initial project validation, but as they are utilized within this monitoring report, they are reported herein and in fact within every Monitoring & Implementation Report.

It should be noted that with the new format of this document (combination of the VCS Monitoring Report and the CCB Project Implementation Report), this section must necessarily contain "climate" variables monitored from both standards. We firstly list the carbon inventory and carbon model variables from the VCS analysis (as reported in the VCS monitoring report). Next, we report all CCB metrics associated with net-positive climate benefits as listed in the CCB Project Implementation Report.

Data Unit / Parameter:	$\rho_{soil,j,k}$
Data unit:	$g \cdot cm^{-3}$
Description:	Mass-equivalent bulk density of fine portion of soil sample. ρ_{soil} is the lower of the two mean values for bulk density a) within the Project Area and b) in the reference area for all plots j across all strata k.
Source of data:	Measured in the Project Area and Reference Area.
Description of measurement methods and procedures to be applied:	Measured according to the SOP: 'Standard Operating Procedure Kasigau - Soil v1.0_5_24_2011.pdf'.
Frequency of monitoring/recording:	Updated at the monitoring event [at least] once every five years.
Value monitored:	Please see table in Section 9.2 for a table displaying all of the data from the soil sampling for this monitoring period.
Monitoring equipment:	As described in the SOP: 'Standard Operating Procedure Kasigau - Soil v1.0_5_24_2011.pdf'. • Handheld GPS receiver • Shovel(s) • Garden hoe

	• Large tarp • Sharpie markers • Soil collection bags.
QA/QC procedures to be applied:	QC: Wildlife Works' VP Carbon Development checks the accuracy of the stratification with sample plot information sourced from the inventory data and also with other available geographical datasets. QA: The accuracy of the classification is also checked partially by the CEO of Wildlife Works Carbon and by the other staff in the Carbon Development department, all of who possess GIS and remote sensing expertise.
Calculation method:	Calculated using Equation 60.
Any comment:	

Data Unit / Parameter:	$a_{j,k}$
Data unit:	Hectares (ha)
Description:	Area of plot j in stratum k
Source of data:	Measured.
Description of measurement methods and procedures to be applied:	Plot radius, and therefore area, are determined according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Tree biomass plots have an area of either 0.02 or 0.2 ha (radius of 8 and 25 m) and Shrub biomass plots an area of either 0.005 or 0.07 ha (radius of 4 and 15 m) depending on the strata within which the plot is located. Please see the file 'Rukinga Carbon Model and NERs_M=3_3.xlsm' for area of specific plots.
Monitoring equipment:	Field measuring tapes for plot delineation and measurement.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Calculation method:	N/A.
Any comment:	

Data Unit / Parameter:	a_k
Data unit:	Hectares (ha)

Description:	Area of stratum k
Source of data:	Measured
Description of measurement methods and procedures to be applied:	GIS analysis is used for the mapping and measurement of the strata within the Project Area.
Frequency of monitoring/recording:	Measured at each monitoring event.
Value monitored:	**Stratum name** / **area (ha)** **ag active** 704.25 **dryland forest strata 1+2** 6,859.05 **dryland forest strata 3** 5,622.55 **dryland forest strata 4** 2,766.93 **dryland forest strata 5** 8,123.51 **dryland forest strata 6** 4,326.41 **grassland** 1,600.18 **montane forest** 56.98 **out** 108.80 **total area** 30,168.66 Additionally, please see the Project Area and strata map in Section 5.1.
Monitoring equipment:	Supervised classification of the Project Area was accomplished using commercial software to perform Land-use/Land-cover classification, as well as to perform QA/QC procedures. Wildlife Works used a common software package to perform this stratification.
QA/QC procedures to be applied:	QC: Wildlife Works' VP Carbon Development checks the accuracy of the stratification with sample plot information sourced from the inventory data and also with other available geographical datasets. QA: The accuracy of the classification is also checked partially by the CEO of Wildlife Works Carbon and by the other staff in the Carbon Development department, all of who possess GIS and remote sensing expertise.
Calculation method:	After identifying strata within the Project, the classes are converted to GIS vectors (polygons) and their area calculated. A map is then created depicted the strata within the Project.
Any comment:	

Data Unit / Parameter:	$cf_{soil,j,k}$
Data unit:	Dimensionless: (kg · kg^{-1}; kilogram Carbon per kilogram soil)

Description:	Carbon fraction of soil sample *j* in plot in stratum *k*
Source of data:	Measurement
Description of measurement methods and procedures to be applied:	Measured according to the SOP: 'Standard Operating Procedure Kasigau - Soil v1.0_5_24_2011.pdf'.
Frequency of monitoring/recording:	Updated at the monitoring event at least once every five years.
Value monitored:	Please see Section 9.3
Monitoring equipment:	As described in the SOP: 'Standard Operating Procedure Kasigau - Soil v1.0_5_24_2011.pdf'. • Handheld GPS receiver • Shovel(s) • Garden hoe • Large tarp • Sharpie markers • Soil collection bags.
QA/QC procedures to be applied:	QC: The VP of African Field Ops and the Director of Operations, Kasigau Corridor are in charge of carrying-out consistency checks of all data and confirming that the field team has followed the SOPs, and they perform regular field audits and data collection checks. QA: The processing of the samples and the soil analysis is done by a third party laboratory, "Cropnuts". The Laboratory has its own measures of control and its management is independent to that of the Project Proponent. A complete description of the company and its procedures can be found at http://www.cropnuts.com
Calculation method:	Calculated from laboratory analysis.
Any comment:	

Data Unit / Parameter:	$dbh_{i,j,k}$
Data unit:	Centimeters (cm)
Description:	Diameter at breast height (DBH) of the ith tree in plot j in stratum k.
Source of data:	Measurement
Description of measurement methods and procedures to be applied:	Tree diameter is measured with a metric diameter tape according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for $dbh_{i,j,k}$ for all plots.

Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: • **Handheld GPS** (with plot coordinates pre-entered in UTM) • **Steel rebar and plot-center caps** for marking plot centers • **Diameter tape** (D-tape) for measuring DBH • **Metric tape** at least 50m long, preferably fiberglass or weatherproof material • **Tree tags** (preferably aluminum to prevent rusting, stamped with successive numbers) • **Flagging tape**, multicolored for marking direction, etc. • **Compass,** preferably with mirror • **Clinometer / Inclinometer** for measuring tree height • **Notepads/plot sheets**, preferably waterproof • **Pens**, preferably waterproof • **Backpack**, equipment holder • **Water, food, sunscreen, bug spray** • **First-aid kit** • **Cell phone, sat-phone or 2-way radios**
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$h_{i,j,k}$
Data unit:	Meters (m)
Description:	Height of the *ith* tree in plot *j* in stratum *k*.
Source of data:	Measurement
Description of measurement methods and procedures to be applied:	Tree height is measured with a metric measurement stick according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf.'
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for $h_{i,j,k}$ for all plots.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following

	equipment is utilized: Tree height measurement stick and/or clinometer
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	v
Data unit:	Count
Description:	Shrub size class per species.
Source of data:	Measurement.
Description of measurement methods and procedures to be applied:	Shrub count is measured using ocular methods according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for the full database of shrub counts for each plot.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: Shrub height measurement stick and field metric measurement tape.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$m_{dry,j,k}$
Data unit:	Kilograms (kg)
Description:	Dry mass of non-tree sample harvested from clip plots in plot j, stratum k.
Source of data:	Measurement.
Description of measurement methods and procedures to be applied:	Dry mass of non-tree sample is measured using destructive harvesting methods according to the procedures detailed in the SOP: Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	As required by the VCS Standard version 3 this parameter is remeasured at least once every five years.

Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for the full database of shrub counts for each plot.
Monitoring equipment:	As stated in the Biomass monitoring SOP: Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: Field metric measurement tape, clippers and a bag for the sample.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$r_{BASE,i,j,k}$
Data unit:	Centimeters (cm)
Description:	Base radius of the ith standing dead, decay class II tree in plot j in stratum k.
Source of data:	Measured
Description of measurement methods and procedures to be applied:	Tree base diameter is measured at breast height with a metric diameter tape according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	The file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' is the primary database and calculator for tree measurement and contains all values measured for $r_{BASE,i,j,k}$ by plot.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: • **Handheld GPS** (with plot coordinates pre-entered in UTM) • **Steel rebar and plot-center caps** for marking plot centers • **Diameter tape** (D-tape) for measuring DBH • **Metric tape** at least 50m long, preferably fiberglass or weatherproof material • **Tree tags** (preferably aluminum to prevent rusting, stamped with successive numbers) • **Flagging tape**, multicolored for marking direction, etc. • **Compass,** preferably with mirror • **Clinometer / Inclinometer** for measuring

	tree height • **Notepads/plot sheets**, preferably waterproof • **Pens**, preferably waterproof • **Backpack**, equipment holder • **Water, food, sunscreen, bug spray** • **First-aid kit** • **Cell phone, sat-phone or 2-way radios**
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A.
Any comment:	

Data Unit / Parameter:	$r_{TOP,i,j,k}$
Data unit:	Centimeters (cm)
Description:	Top radius of the ith standing dead, decay class II tree in plot j in stratum k.
Source of data:	Estimated.
Description of measurement methods and procedures to be applied:	The top diameter of standing dead, decay class trees is conservatively estimated to be 0 cm. This is the most conservative value for top diameter since the standing dead bole volume is calculated with the equation of a truncated cone, using Equation 52.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	0 The 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' is the primary database and calculator for tree measurement and shows that the values estimated for $r_{TOP,i,j,k}$ are all 0.
Monitoring equipment:	N/A.
QA/QC procedures to be applied:	N/A.
Calculation method:	N/A.
Any comment:	

Data Unit / Parameter:	$v_{i,j,k}$
Data unit:	m^3
Description:	Volume of the ith standing dead, decay class II tree in plot j in stratum k.
Source of data:	Calculated from equation 51 in the methodology.
Description of measurement methods and	N/A.

procedures to be applied:	
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm', which is primary database and calculator for the tree measurement and contains all values measured for $r_{BASE,i,j,k}$ by plot.
Monitoring equipment:	N/A.
QA/QC procedures to be applied:	N/A
Calculation method:	Calculated from equation 51 in the methodology.
Any comment:	

Data Unit / Parameter:	$y_{INTACT,j,k}$
Data unit:	Tonnes CO_2e • ha^{-1}
Description:	Carbon stock in standing dead trees in decay class I, plot j, stratum k.
Source of data:	Measurement.
Description of measurement methods and procedures to be applied:	Carbon stock is measured using a diameter tape according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for the full database of standing dead trees in decay class I for each plot.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: GPS unit, diameter tape and field metric measurement tape.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$y_{DECAYED,j,k}$
Data unit:	Tonnes CO_2e • ha^{-1}
Description:	Carbon stock in standing dead trees in decay class II, plot j, stratum k.
Source of data:	Measurement.

Description of measurement methods and procedures to be applied:	Carbon stock is measured using a diameter tape according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf'.
Frequency of monitoring/recording:	20% of biomass plots are measured annually, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=3_v3.xlsm' for the full database of standing dead trees in decay class II for each plot.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Forest Inventory v2.8_2012-11-12.pdf', the following equipment is utilized: GPS unit, diameter tape and field metric measurement tape.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$C_{AGLT}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in above-ground large trees at monitoring period $[m]$.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	1,547,108.97
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	Value calculated using the procedures described in Section 13.5.1 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$C_{AGNT}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in above-ground non-tree biomass at monitoring period $[m]$.
Source of data:	Calculated

Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	259,671.88
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	Value calculated using the procedures described in Section 13.5.3 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$C_{BGLT}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in below-ground large tree biomass at monitoring period $[m]$.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	616,993.16
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	Value calculated using the procedures described in Section 13.6.1 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$C_{BGNT}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in below-ground non-tree biomass at monitoring period $[m]$.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	103,868.75
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A

Calculation method:	Value calculated using the procedures described in Section 13.6.3 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$C_{SDW}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in standing dead wood at monitoring period $[m]$.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	51,530.4
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	Value calculated using the procedures described in Section 13.7 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$C_{SOIL}^{[m]}$
Data unit:	Tonnes CO_2e
Description:	Estimated carbon stock in soil carbon at monitoring period $[m]$.
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	12,370,530.22
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	Value calculated using the procedures described in Section 13.9 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$m_{burned,i}$

Data unit:	Tonnes
Description:	The mass of wood burned during the ith event.
Source of data:	Records of biomass burned and charcoal production in the Project Area.
Description of measurement methods and procedures to be applied:	N/A. This variable is not monitored as there is no biomass burning or charcoal production within the Project Area.
Frequency of monitoring/recording:	N/A
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$o_i^{[m]}$
Data unit:	Proportion
Description:	Degradation proportion observation taken in each leakage plot i^{th} sample point at monitoring period m.
Source of data:	Measurement.
Description of measurement methods and procedures to be applied:	Leakage sampling point degradation is measured using ocular methods according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Leakage v1.0_01_01_2011.pdf'.
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	Please see Section 9.4 for a table displaying the leakage data that was measured at this monitoring period.
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Leakage v1.0_01_01_2011.pdf', the following equipment is utilized: Compass, metric tape measure, and handheld GPS unit.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A.
Any comment:	

Data Unit / Parameter:	$\bar{o}^{[m]}$
Data unit:	Proportion

Description:	Average of state observations taken in the leakage area for monitoring period $[m]$.
Source of data:	Measurement.
Description of measurement methods and procedures to be applied:	Leakage sampling point degradation is measured using ocular methods according to the procedures detailed in the SOP: 'Standard Operating Procedure Kasigau - Leakage v1.0_01_01_2011.pdf'.
Frequency of monitoring/recording:	Updated at every monitoring period.
Value monitored:	0.547
Monitoring equipment:	As stated in the Biomass monitoring SOP 'Standard Operating Procedure Kasigau - Leakage v1.0_01_01_2011.pdf', the following equipment is utilized: Compass, metric tape measure, and handheld GPS unit.
QA/QC procedures to be applied:	Procedures applied according to the SOP: 'Quality Control Procedure v1.6.pdf'.
Calculation method:	N/A.
Any comment:	

Data Unit / Parameter:	F_{LE}
Data unit:	Proportion
Description:	Proportion cumulative deforestation and degradation predicted by the leakage model.
Source of data:	Calculated.
Description of measurement methods and procedures to be applied:	N/A.
Frequency of monitoring/recording:	Predicted from the model at each monitoring period.
Value monitored:	0.688
Monitoring equipment:	N/A.
QA/QC procedures to be applied:	N/A.
Calculation method:	Calculated from a model, see Equatuion 8 in the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	$\hat{r}_{LE}^{[m]}$
Data unit:	Proportion
Description:	The estimated leakage factor as a proportion of baseline emissions.

Source of data:	Calculated
Description of measurement methods and procedures to be applied:	Estimated based on the difference between the observed deforestation in the reference area and predicted deforestation in the reference area as described in Section 10.4 of the VCS methodology VM0009 v1.1.
Frequency of monitoring/recording:	Updated at each monitoring period.
Value monitored:	0
Monitoring equipment:	N/A.
QA/QC procedures to be applied:	*N/A*.
Calculation method:	Value calculated using the procedures described in Section 10.4 of the VCS methodology VM0009 v1.1.
Any comment:	

Data Unit / Parameter:	N_P
Data unit:	Count
Description:	Total number of possible plots in Project Area.
Source of data:	Calculated.
Description of measurement methods and procedures to be applied:	GIS analysis at the time of stratification.
Frequency of monitoring/recording:	Updated whenever stratification of the Project Area is updated.
Value monitored:	1,500,466.05
Monitoring equipment:	Supervised classification of the Project Area was accomplished using commercial software to perform Land-use/Land-cover classification, as well as to perform QA/QC procedures. Wildlife Works used a common software package to perform this stratification. ArcGIS software is used for area measurement of the Project Area and strata.
QA/QC procedures to be applied:	QC: Wildlife Works' VP Carbon Development checks the accuracy of the stratification with sample plot information sourced from the inventory data and also with other available geographical datasets. QA: The accuracy of the classification is also checked partially by the CEO of Wildlife Works Carbon and by the other staff in the Carbon Development department, all of who possess GIS and remote sensing expertise.
Calculation method:	Calculated with the Equation $N_P = \frac{a_{project}}{a_{plot}}$
Any comment:	

<table>
<tr><td>Data Unit / Parameter:</td><td>$N_{P,k}$</td></tr>
<tr><td>Data unit:</td><td>Count</td></tr>
<tr><td>Description:</td><td>Total number of possible plots in stratum k.</td></tr>
<tr><td>Source of data:</td><td>Calculated.</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>GIS analysis at the time of stratification.</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Updated whenever stratification of the Project Area is updated.</td></tr>
<tr><td>Value monitored:</td><td>
<table>
<tr><th>Stratum name</th><th>Total number of possible plots</th></tr>
<tr><td>ag active</td><td>35,026.51</td></tr>
<tr><td>dryland forest strata 1+2</td><td>341,141.20</td></tr>
<tr><td>dryland forest strata 3</td><td>279,642.67</td></tr>
<tr><td>dryland forest strata 4</td><td>137,615.93</td></tr>
<tr><td>dryland forest strata 5</td><td>404,030.06</td></tr>
<tr><td>dryland forest strata 6</td><td>215,177.99</td></tr>
<tr><td>grassland</td><td>79,586.37</td></tr>
<tr><td>montane forest</td><td>2,834.05</td></tr>
</table>
</td></tr>
<tr><td>Monitoring equipment:</td><td>Supervised classification of the Project Area was accomplished using commercial software to perform Land-use/Land-cover classification, as well as to perform QA/QC procedures. Wildlife Works used a common software package to perform this stratification. ArcGIS software is used for area measurement of the Project Area and strata.</td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>QC: Wildlife Works' VP Carbon Development checks the accuracy of the stratification with sample plot information sourced from the inventory data and also with other available geographical datasets.

QA: The accuracy of the classification is also checked partially by the CEO of Wildlife Works Carbon and by the other staff in the Carbon Development department, all of who possess GIS and remote sensing expertise.</td></tr>
<tr><td>Calculation method:</td><td>Calculated with the Equation $N_{P,k} = \frac{a_k}{a_{plot}}$</td></tr>
<tr><td>Any comment:</td><td></td></tr>
</table>

Include parameters for assessing anticipated and actual impacts (positive and negative) on communities and biodiversity resulting from the project activities (see CM3 & B3).

The following data metrics assess net-positive impacts on community and biodiversity as reported to the CCB standard previously in the Project Implementation Report (PIR).

CCB Community and Biodiversity Metrics

Social Impact Assessment

As described during the last monitoring period (m_2), the Social Impact Assessment (SIA) gathers data continuously and reports them on an annual basis. The aim is to assess any changes in stakeholder livelihoods that are attributable to the REDD Project. The SIA indicators are presented in the tables below.

Community Indicators
The following metrics are applied to the Project Activities that provide net-positive impact on the communities within the sphere of influence of the Project.

Organic Greenhouse Project

Indicator - Number full time jobs
- Wildlife Works employees

Number of full time employees	
	WW employee
2010	8
2011	15
2012	**23**

Indicator – Local Employment
- How many employees come from Project Area communities?
- How many employees come from outside Project Area communities?

Local employment		
	Number employed from Project Area	**Number employed from outside Project Area**
2010	8	0
2011	15	0
2012	**23**	**0**

Indicator – Financial Investment/Return

- Monies invested in capital expense (CAPEX) for new greenhouse / greenhouse expansion since the REDD Project began, 1st Jan, 2010.
- Annual operating expenses since the REDD Project began, 1st Jan, 2010.

Monies invested in capital expense	
Year	**KSH**
2010	0
2011	566,000
2012	**140,120**

Annual operating costs	
Year	**KSH**
2010	756,491
2011	547,400
2012	**3,025,805.50**

Indicator – *number of newly implemented greenhouses*
Indicator – *number of trees propagated in greenhouse(s)*

- total - all species
- fruit and agroforestry/fuelwood trees
- Indigenous trees for reforestation projects

The Wildlife Works greenhouse facility was built in 2010. It is a complex of 3 individual greenhouses, with one dedicated to propagation of fruit trees, and two for propagation of indigenous plants and trees. In 2012 two additional greenhouses of the type 'Amiran' were built at the Wildlife Works greenhouse facility. These are run independently by the Imani women's group under the brand Amiran, but obtain assistance from Wildlife Works. This project is a trial program to analyze best practices for propagation (organic vs. conventional) as well as determining necessary conditions and running costs for successful crop production. This includes cost of and quantity of water needed for irrigation and species and variety selection, amongst other aspects. Upon completion of the trial program the results will be used to promote this system for widespread use in the surrounding communities.

Number of greenhouse locations implemented		
	Wildlife Works	Amiran
2010	3	0
2011	0	0
2012	**0**	**2**

Number of trees propagated in Wildlife Works greenhouse

Inventory Date	Total number of seedlings	Fruit / agroforestry	Indigenous for reforestation	Number of species
2010	0	0	0	0
November 2011	11,655	2,448	9,217	36
April 2012	33758	12,423	21,335	37
December 2012	**11,238**	**11,125**	**113**	**35**

Type of species and quantities sold at the Wildlife Works' selling point.

Species	Units sold	Price per unit	Total KSH per species
Amavula	30	50	1500
Apple mango	665	100	66500
Avocado	3	50	150
Bamba coffee	14	50	700
Borgun villea	58	50	2900
Calia flowers	20	50	1000
Castard apple	9	50	450
Chilly	300	300	90000
Clementine	20	100	2000
Duncan orange	20	100	2000
Fanta orange	1	100	100
Grapemash	87	100	8700
Grilicidia	12	50	600
Guavas	43	50	2150
Indigenous species	100	100	10000
Jatropha	6	50	300
Lannea	4	50	200
Lime	16	100	1600
Local mango	5	50	250
Majidea	8	50	400
Miniola	206	100	20600
Moringa	14	50	700
Mwatina	7	50	350
Neem tree	7	50	350
Ngoe	40	100	4000
Ngoe mango	29	100	2900
Ovacado	16	50	800
Passion	32	100	3200

Pixie	317	50	15850
Root stock mango	51	50	2550
Rough lemon	4	50	200
S.Birrea	2	50	100
Solosunrise	54	50	2700
Tahit	1	100	100
Tangerine	58	100	5800
Tanit	1	100	100
Terminalia	2	50	100
Valencialate	156	100	15600
Washington navel	1	100	100
Zambarau	3	50	150
TOTAL	**2,422**		**267,750**

Indicator – Community reforestation project results

- Tree Survival Rates
- Total Trees Planted

Results for this project were primarily measured using tree survival rates. The following table summarizes survival rates for the current monitoring period. Note that we track survival rates for seeds planted the previous year, so the following table indicates measurement made in 2012 for seeds planted in 2011. The Grand total (average) seedling survival rate for seeds planted in 2011 was **58%**:

Seedling Survival

Outplanting Location Name	2011 (%)
ACK Marungu	82.8
AIC Maungu	75.0
Bughuta Primary	92.7
Bughuta Secondary	68.4
Camp Kenya	80.0
Chiefs Office (Maungu)	15.6
Gideon Mosi Primary	62.4
Holiday Villa	2.1
Ian Pesa	81.0
Itinyi Primary	61.8
Kajire Primary	61.6
Kale Poa Kiosk	32.5
Kale Primary	76.8
Kale Youth Bunge	48.4
Kamkunji Itinyi Committee	85.9

Kibaoni Site	78.8
Kileva Primary	16.6
Kirumbi Primary	50.4
Kisimenyi Primary	72.9
Kiteghe Primary	47.0
Kwa Mwakala Mboga	85.9
Malewa Trust	61.4
Marasi Primary	56.5
Marungu Dispensary	62.8
Marungu Primary	50.6
Marungu Secondary	58.0
Mbele Primary	51.3
Miasenyi Community	76.9
Miasenyi Primary	57.0
Mkamenyi Primary	61.2
Moi High School	53.0
Msharinyi Primary	69.2
Pump House	51.2
Rukanga Primary	76.6
Sowa Primary	64.2
St. Joseph Girls Sec	2.7
Taita Village	13.7
Winnie Mkalisha (Itinyi)	60.8
Grand Total	**57.9**

The following indicates the total seeds planted by location type. A list of all locations and corresponding seed planting totals is available upon request in the carbon office:

Total seeds planted by site type

Project Site	2010	2011	2012	Total Planted
Communal area	4,500	22,020	**4,119**	30,639
Private non-residence	20	3,037	**289**	3,346
Private residence	2,500	4,067	**1,355**	7,922
Ranch boma			**7,000**	7,000
School	8,920	26,120	**7,547**	42,587
Grand Total	**15,940**	**55,244**	**20,310**	**91,494**

Jojoba/Dryland Farming Project

Indicator - Number full time jobs

- Wildlife Works employees
- Total including in-community

Indicator – Local Employment

- How many employees come from Project Area communities
- How many employees come from outside Project Area communities?

Indicator – Financial Investment/Return

- Monies invested in capital expense (CAPEX) since the REDD Project began, 1st Jan, 2010
- Annual operating expenses on Jojoba project since the REDD Project began, 1st Jan, 2010
- Income generated from Jojoba project since the REDD Project began, 1st Jan, 2010.

A Kenyan Ph.D student from Soikoine University in Tanzania oversees the Jojoba project. He is independently funded at this time, and not considered a WWC employee. He is however assisted by a Wildlife Works employee.

Number of full time employees	
Year	**WW employee**
2010	
2011	1
2012	**1**

Local employment		
Year	**Number employed from Project Area**	**Number employed from outside Project Area**
2010		
2011	1	0
2012	**1**	**0**

Financial Investment/Return	
Monies invested in capital expense (CAPEX) since the REDD Project began, 1st Jan, 2010	
2010	0
2011	0
2012	**0**

Annual operating expenses on Jojoba project since the REDD Project began, 1st Jan, 2010	
	KSH
Jan - Dec 2010 (paid by government)	72,000
Jan - June 2011(paid by government)	36,000
July 2011 - Dec 2011 (paid by WW)	36,000
Jan 2012 - April 2012 (paid by WW)	**92,000**

Income generated from Jojoba project since the REDD Project began, 1st Jan, 2010.	
2010	8,000
2011	8,000
2012	**8,000**

EcoFactory

Indicator - Number full time jobs

- Wildlife Works employees
- Total including in community (screen printing, etc.)

Indicator – Local Employment

- How many employees come from Project Area communities
- How many employees do not come from Project Area Communities

Indicator – Financial Investment/Return

- The annual operating expenses since the REDD Project began
- Annual factory operating costs since Jan 1st 2005
- Income generated from EcoFactory since the REDD Project began
- Annual income from EcoFactory since the REDD Project began

EcoFactory Indicators

Full time employment in the EPZ				
Year	**EcoFactory**	**Screen printing**	**Locals**	**Non-locals**
2010	15	0	15	0
2011	25	0	25	0
2012	**62**	**4**	**66**	**0**

Financial investment into EcoFactory				
Year	**CAPEX USD**	**Operating costs USD**	**Returns USD**	**Profit USD**
2005		76,300	48,450	
2006		59,500	51,000	
2007		75,000	57,000	
2008		1,625,828	32,000	
2009		647,824	54,000	
2010		14,023,555	22,000	
2011		6,930,670		
2012		**23,084,356**	**175,049.65**	

Financial investment into Printing factory				
Year	**CAPEX USD**	**Operating costs USD**	**Returns USD**	**Profit USD**
2005				
2006				
2007				
2008		35,000		
2009				
2010				
2011		35,020		
2012		**820,284**		

Local Kenyan Sales from Factory	
Year	**Sales from Factory in USD**
2005	500
2006	1,700
2007	3,000
2008	5,000
2009	6,000
2010	200
2011	0
2012	**0**

Ecotourism in Project and Reference Areas

Indicator - Number full time jobs

- WW employees
- Total including in-community (Camp Kenya, etc.)

Indicator – Local Employment

- How many employees come from Project Area communities?
- How many employees come from outside Project Area communities?

Number of full time employees		
	WW employee	**Total included in-community (Camp Kenya)**
2010		
2011		
2012	**0**	**9**
Local employment		
	Number employed from Project Area	**Number employed from outside Project Area**
2010		
2011		
2012	**6**	**3**

Community Projects

1. Educational Bursaries

Indicator – Number of bursaries for local children each year

- Paid by Wildlife Works
- Paid by Kelimu Trust and other sponsors

Indicator – $ invested in school construction and maintenance

- Fund amount, date, where used, number of children housed, outcome

Number of bursaries for local children each year									
Year	**Source Of Funds**	**Secondary**	**Amount Secondary (KSH)**	**Tertiary**	**Amount Tertiary (KSH)**	**University**	**Amount University (KSH)**	**Total Students**	**TOTAL Amount (KSH)**
2011	Kelimu Trust	72	2,880,000	3	297,000	4	200,000	79	3,377,000
	WWCT Bursary Scheme	0	0	0	0	0	0	0	0
	CDF	1,171	3,766,780	185	1,345,500	193	1,289,000	1549	6,401,280
	Equity Bank	0	0	0	0	0	0	0	0

2012	Kelimu Trust	59	2,360,000	2	198,000	4	200,000	65	2,758,000
	WWCT Bursary Scheme	**1,184**	**7,616,560**	**291**	**1,687,000**	**132**	**1,552,000**	**1,607**	**10,855,560**
	CDF	112	40,600	12	61,000	10	60,000	134	161,600
	Equity Bank	40	1,600,000	0	0		0	40	1,600,000

Wildlife Works Bursary Scheme (WWCT)

- Level of education and number of students that receive bursaries in each location.

Year	Location	Total No University	Total No Tertiary	Total No Secondary	Total students sponsored
2012	Marungu	13	19	160	**192**
	Sagalla	40	128	339	**507**
	Mwachabo	32	51	286	**369**
	Mwatate	32	47	241	**320**
	Kasigau	15	46	158	**219**
	Total	**132**	**291**	**1,184**	**1,607**

Wildlife Works Carbon Trust Bursary Scheme (WWCT)

- Total amount (Ksh) of bursaries given out according to level of education and location.

Year	Location	Total Amount University (KSH)	Total Amount Tertiary (KSH)	Total Amount Secondary (KSH)
2012	Marungu	156,000	165,000	2,048,560
	Sagalla	480,000	604,000	1,343,000
	Mwachabo	416,000	328,000	1,233,000
	Mwatate	320,000	298,000	1,480,000
	Kasigau	180,000	292,000	1,512,000
		1,552,000	**1,687,000**	**7,616,560**
Grand Total				**10,855,560**

2. School Construction and Maintenance

2012 Total monies invested in school improvement (classroom construction and maintenance) through the WWCT.

Location	Specific Area/Site	Project Type	Brief description	Status	Projected Cost	Already Spent	Output/ Outcome

Kasigau	Moi SS	Furniture	Constructing desks, tables and double decks	Completed	720,000	630,000	There is enough furniture for students
Kasigau	Zungulukani	Building	Classroom construction	On-hold			
Mwachabo	Mngama PS	Building	Classroom construction	Completed	759,000	645,150	Reduced congestion of classes
Mwachabo	Mwemba PS	Building	Classroom and Office	Ongoing	1,682,015	1,429,713	Reduced distance to get to school
Sagalla	Talio Youth Poly	Building	Classroom construction	On-hold			
Sagalla	Marie PS	Building	Construction of staff houses	On-hold			
Sagalla	Mwambiti PS	Building	Completion of two classrooms	On-hold			
Sagalla	Mchaninga Nursery	Building	Classroom construction	On-hold			
Sagalla	Kileva PS	Building	Classroom construction	On-hold			
Mwatate	Mwatate SS	Building	Classroom construction	Ongoing	800,000	680,000	Better learning condition for students
Mwatate	Mzwanenyi PS	Building	Classrooms' repair (floor & roofing)	On-hold			

Other metrics, such as student success rates are available upon request.

3. Water Projects

The following projects are also supported by the WWCT:

Community water projects

Year	Location	Specific Area / Site	Project Category	Project Type	Brief description	Status
2011	Marungu	Itinyi-Zaire	Water	Pipeline	Construction of gravity pipeline with 5 selling points	On-hold
2012	Kasigau	Jora	Water	Water tank	Tank construction	Completed
2012	Kasigau	Buguta	Water	Water pan	Expanding pan	On-hold
2012	Kasigau	Makwasinyi	Water	Pipeline	Pipeline repair	On-hold
2012	Kasigau	Makwasinyi	Water	Water tank	Tank construction	Completed

2012	Kasigau	Rukanga	Water	Water tank	Tank construction	On-hold
2012	Mwachabo	Ngangu	Water	Pipeline	Rehabilitating old line; Constructing two new lines to schools	Completed
2012	Sagalla	Kirumbi	Water	Building	Construction of cattle trough and fencing around	On-hold
2012	Mwatate	Maili kumi PS	Water	Water harvesting	Construction of roof catchments and storage tanks	Ongoing
2012	Marungu	Sasenyi	Water	Water harvesting	Construction of Sasenyi rock catchment	Ongoing
2012	Marungu	Marungu	Water	Water harvesting	Guttering at Marungu Health Centre	Completed

4. Other WWCT Projects

Other Projects funded by the WWCT during the current monitoring period (m_3)

Year	Location	Specific Area / Site	Project Category	Project Type	Brief description	Status
2012	Sagalla	Bamako Dispensary	Health	Building	Construction of a clinic room & pit latrine	On-hold
2012	Mwachabo	Mwatate town	Other	Building	Construction of CBO's Office	Completed
2012	Mwatate	Mwatunge	Other	Building	Construction of CBO's Office	Completed

Soap Factory

We reported the soap factory as a Project Activity last monitoring period (m_2), but it was in a fledgling state, and we therefore had no indicator data. This monitoring period, the indicators listed below were reported. As of mid-2012, the soap factory is in the process of being moved into a newly built custom production facility, and has therefore been on a production hiatus (toward the end of 2012). Production is scheduled to start back shortly.

Indicator - # of full-time Employees
Indicator - # of local employees
Indicator - Financial Investment / Return

Soap factory Indicators		
Number of full time employees		
	WW employee	**Total included in community**

2010	1	0
2011	1	0
2012	**1**	**0**
Local employment		
	Number employed from Project Area	**Number employed from outside Project Area**
2010	1	0
2011	1	0
2012	**1**	**0**
Financial Investment/Return		
Monies invested in capital expense (CAPEX) since the REDD Project began, 1st Jan, 2010		
	KSH	
2010	0	
2011	0	
2012	**99,900**	
Annual operating expenses on Soap Project since the REDD Project began, 1st Jan, 2010		
	KSH	
2010	86,400	
2011	115,920	
2012	**4,389**	
Income generated from Soap Project since the REDD Project began, 1st January 2010.		
	KSH	
2010	80,750	
2011	46,750	
2012	**0**	

Biodiversity Indicators

As mentioned and examined in detail previously in Section 2.2.4 *Wildlife Works' Biodiversity and Social Monitoring Plan*, Wildlife Works conducts a yearly assessment / analysis of the state of biodiversity and socioeconomics in the Project's sphere of influence. For the sake of brevity and so as to avoid redundancy, the biodiversity and social indicators listed in section 2.2.4, which includes a full complement of results, will not be repeated here. However, we have chosen to consider all ranger data (including incidents, arrest, flora & fauna sightings, etc.) in this section. The following sub-sections address the highly respected Wildlife Works rangers and their activities over the past calendar year (m_3). Also, we have chosen to report human resources data in this section, as it tends to fit with the ranger statistics quite well, and we have always coupled these two sections together in the past.

Indicator – Overall Project Incidents

The human death listed below is the Wildlife Works' ranger Abdulai Mohammed, who was killed by a poacher during an incident in January of 2012. A second ranger, Ijema Funan was injured in the same incident and is still recovering from his injuries.

The information reported below is additionally used for the disturbance monitoring within the Project Area. None of the incidents reported below for 2012 met the definition of a significant disturbance that would need to be reported as a project emission. For the reported logging events, one was an individual with a bundle of sandalwood, and the other four were bundles of wood found that were being prepared for charcoal kilns. The reported fire occurred on Rukinga Sanctuary and covered an area estimated at 3.8 ha, and burned mainly shrub and herbaceous material. This event did not meet the definition of a significant project emission under the Wildlife Works' Disturbance Monitoring SOP, and is therefore not included as a project emission. It is thought that this fire was accidently set by illegal charcoal producers.

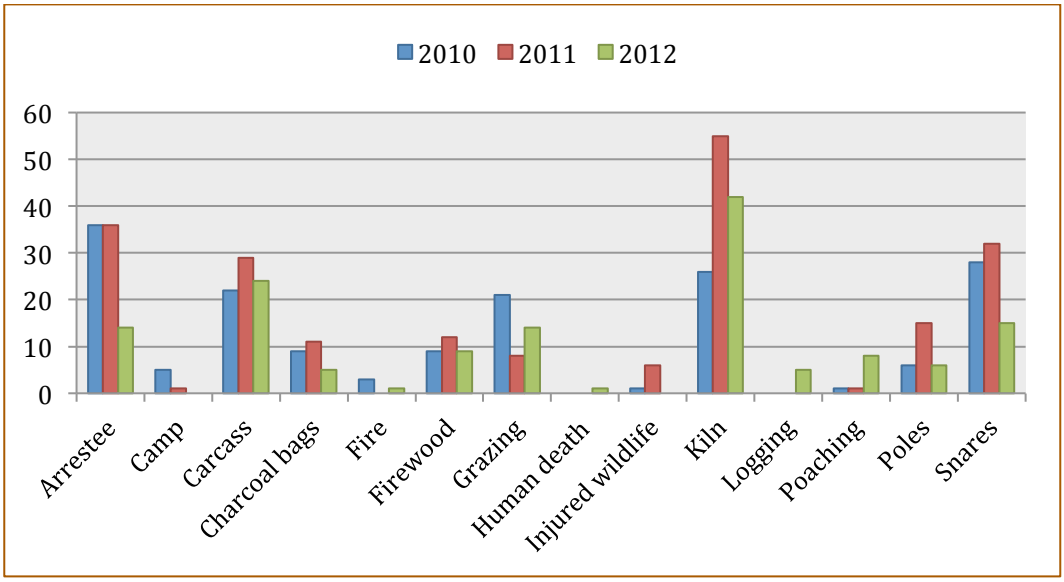
Overall Project Incidents

Project Incidents				
Number of Incidents	**2010**	**2011**	**2012**	**Grand Total**
Arrestee	36	36	14	86
Camp	5	1	0	6
Carcass	22	29	24	75
Charcoal bags	9	11	5	25
Fire	3	0	1	4
Firewood	9	12	9	30
Grazing	21	8	14	43
Human death	0	0	1	1
Injured wildlife	1	6	0	7
Kiln	26	55	42	123
Logging	0	0	5	5
Poaching	1	1	8	10
Poles	6	15	6	27
Snares	28	32	15	75
Total	**167**	**206**	**144**	**517**

Animal Incidents / Poaching

Incidents	Details	2010	2011	2012	Grand Total
type	Buffalo	2	1	0	3
	Common Zebra	0	1	0	1
	Dik dik	3	4	2	9
	Eland	1	0	0	1
	Elephant	**12**	**19**	**21**	**52**
	Gerenuk	0	1	0	1

	Giraffe	1	0	1	2
	Impala	1	1	0	2
	Lesser Kudu	2	1	0	3
	Warthog	0	1	0	1
Total		**22**	**29**	**24**	**75**



Kasigau Corridor Phase I and Phase II Recorded Incidents throughout the Project Area

Ranger Recruiting / Expenses

During this monitoring period, 9 new rangers were hired from the existing recruitment lists. No new recruiting events were held

Species Sightings

Please see Section 2.2.6 *Biodiversity and Social Monitoring Plan* for detail.

Project Human Resources

An overall human resources plan has been fully implemented over the past year (m_3). Please find a detailed list of HR metrics in Annex 1. The following key indicators are used to measure the efficacy of Wildlife Works' program.

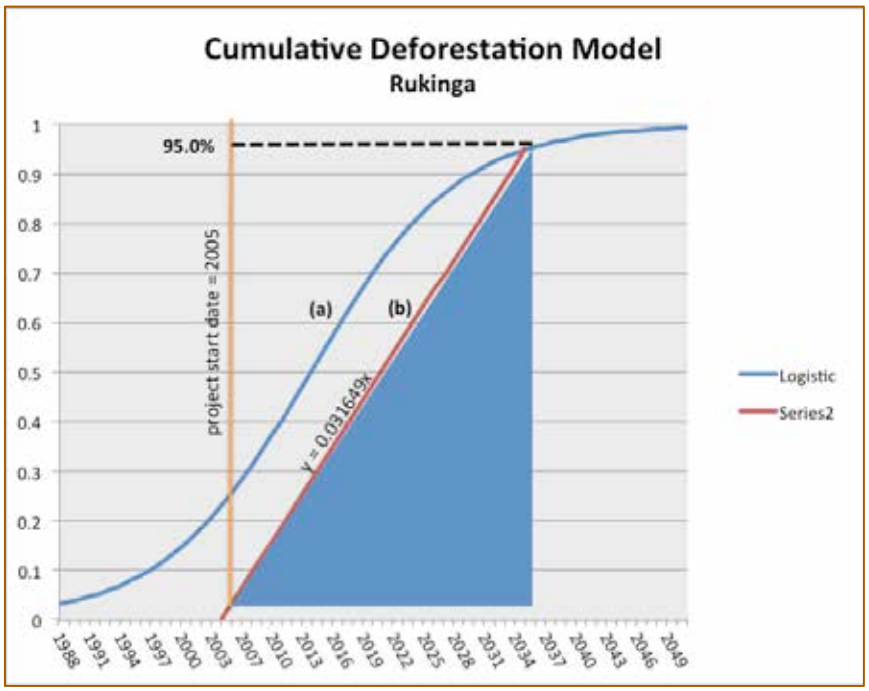
- Number of employees permanently employed
- Number of casual employees
- Number of employees for each Project Activity or department
- Number of employees from the local area
- Number of employees that are not local

6 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS (CLIMATE)

6.1 Baseline Emissions (G2)

Baseline emissions for the current monitoring period (m_3) are calculated as follows:

The same Cumulative Deforestation Model (CDM) curve is used for the current monitoring period as was used for the previous period. The CDM (baseline) will be re-evaluated at the 10-year mark, but not before. As stated in last monitoring period's report, Wildlife Works chose a conservative linear baseline prediction for baseline emissions, based on historical deforestation observations and modeled with a logistical deforestation curve. This linear deforestation rate follows the stipulation in VM0009 V1.1, section 6.4.8 Linear Prediction of Deforestation. Both the logistical CDM and chosen conservative linear deforestation rate are depicted in the chart below.



The cumulative gross and net emission reductions (January 1, 2010 to December 31, 2012) are as follows, by year:

Monitoring Period	2005- 2010 (m_1)	2011 (m_2)	2012 (m_3)	Cum. TOTAL
Baseline deforestation %	11.1%	22.15%	25.32%	–
Gross NERs	1,450,329	250,465	244,944	**1,945,739**
Percent of ERs to VCS pooled buffer account	20%	15%	15%	–
Buffer tonnes to VCS	290,066	37,570	36,742	**364,378**
Net issued NERs	1,160,263	212,895	208,202	**1,581,360**

Quantify the baseline emissions and/or removals (See G2.3)

For soil carbon, we must use a separate model, as unlike with forest carbon, complete soil carbon loss does not occur in the baseline scenario. We again followed the VCS methodology *VM0009 Methodology for Avoided Mosaic Deforestation of Tropical Forests V1.1* for soil carbon, which dictates a decay curve that eventually settles on a mean loss value for soil carbon lost through clearing of agricultural land. We measured soil carbon in a number of proxy sites immediately adjacent to the Project Area, on farm land with identical soil, rainfall and climate, which in all cases had been forest less than 20 years before. The sampling methodology was identical to that used for the soil carbon estimates within the Project Area: 1 m pits dug in two lifts, 0-30 cm and 31-100 cm and samples from each layer were thoroughly mixed, bagged and sent to an independent soil testing lab for bulk density and soil organic matter (SOM) analysis. The results of the soil carbon analysis are in the file 'Rukinga 1m Soil Analysis – RA V2.xlsx', which was provided to the project validators/verifiers.

This analysis yielded a mean difference in soil carbon between the "with-project" and "without project" of 185 tonnes GHG per ha converted to farm land under annual crops, or a 45% reduction in soil carbon value on conversion.

Summarizing for all pools the GHG loss in Baseline is:

Pool	Total GHG (t CO_2e)	Loss in Baseline over 30 years (t CO_2e)
Aboveground and Belowground forest biomass (trees, shrubs, grasses)	2,527,642.76	2,399,926
Soils	12,370,530.22	5,230,568
Total	**14,898,172.98**	**7,630,494**
Average Annual loss over 30 years (m.t. GHG) – GROSS NERs		**254,350**

6.2 Project Emissions

Quantify project emissions and/or removals.

Project emissions are estimated as follows:

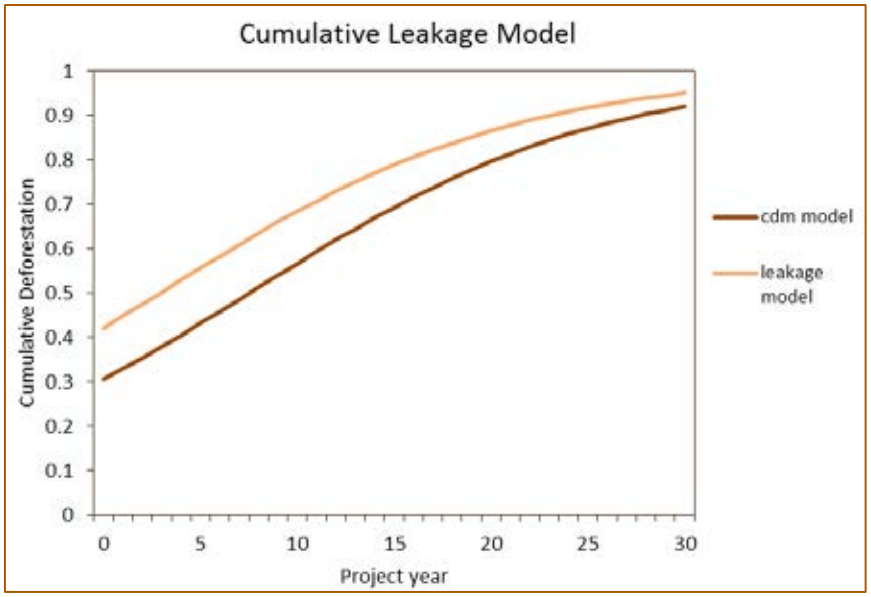
- All eligible carbon pools fell under the *de minimis* limit as described in the VCS Methodology VM0009, section 9 Project Emissions and in VCS 2007.1;
- There were no significant fire events in this monitoring period (m_3). If a significant fire event were to occur, Wildlife Works would be required to produce a map of the boundaries for the fire prior to the subsequent monitoring period, as stipulated in VM0009 V1.1;
- Burning of woody biomass (see VM0009, section 9 Project Emissions) in the Project Area falls below the *de minimis* threshold for this monitoring period (m_3).

6.3 Leakage

Quantify leakage emissions.

During the first monitoring period (m_1), the leakage lag period, $\hat{\delta}_{LE}$, was measured using empirical leakage plot data. The leakage model was built from this data (see below), and used to measure adjustments for leakage in the current and subsequent monitoring periods, until baseline reevaluation. Leakage was calculated and deducted from gross emission reductions as follows:

$$\hat{\delta}_{LE} \text{ (t=0) = -0.762}$$



For this monitoring period, $\hat{\delta}_t$ is measured as the estimate of cumulative deforestation and degradation in the leakage plots:

$$\hat{\delta}_3 = 0.547$$

And compared to the cumulative leakage model at time t=3, per VM0009 V1.1, equation [33]:

$$\hat{r}_{LE}^{[3]} = 0\%$$

We then calculate leakage for the current monitoring period, per VM0009 V1.1 equation [32]:

$$C_{LE}^{[3]} = \hat{r}_{LE}^{[3]} C_{BE}^{[3]} = 0 \cdot 244{,}944 = \mathbf{0}$$

6.4 Summary of GHG Emission Reductions and Removals (CL1 & CL2)

Quantify the net GHG emission reductions and removals. Include net change in carbon stocks (see CL1.1-1.4 and CL2.3).

Specify breakdown of GHG emission reductions and removals by vintages where the intent is to issue each vintage separately in the VCS registry system.

Net emissions reductions to date are quantified from the components shown in the table below, which include estimated gross emissions reductions, any uncertainty deductions, deductions for leakage and deductions for the risk of reversal buffer pool. Error analysis for the current monitoring period m_3 is also included below. It should be noted that the error analysis was performed on the full set of plot monitoring data, with the re-measured plots being pooled with the data from the previous monitoring period for the plots not selected for re-measurement at the m_3 monitoring period (20%, randomly selected):

Component	Value
Baseline deforestation percentage, m_3	25.32
Uncertainty Deduction	0
Project Emissions, m_3	0
Emissions from Leakage, m_3	0
Gross emissions reductions, m_3	244,944
NERs to Buffer Pool, (15%), m_3	36,742
Net emissions reductions NERs, m_3	**208,202**
Standard error	641,982.38
Error percentage	**8.45%**

6.5 Climate Change Adaptation Benefits (GL1)

For projects that included this optional criterion in the project description, describe how project activities are assisting communities and/or biodiversity to adapt to the probable impacts of climate change (see GL1.1-4).

There is overwhelming evidence in the literature that there will be significant negative climate change and climate variability impacts on the communities in the Project Zone. Traditionally these communities have depended heavily on subsistence agriculture in an area that maybe one of the least fertile areas for agriculture in Kenya. In addition, the rains have failed far more frequently in recent years, and even when they have come have been unpredictable. This had lead to missed opportunities for sowing seeds at the right time in the season, which would ensure a harvest even in seasons with a low amount of rain. This problem will most likely only increase given the likelihood of more severe climate change impacts in the future. The result of the resulting food insecurity causes farmers to continue moving, clearing more land in the hopes that they will find a better plot on which the variable and highly localized rains will fall. In the Baseline scenario, we therefore anticipate even higher deforestation rates in the future. The other impact of failed crops is that it triggers an increase in poaching of bushmeat. The native wildlife populations are drought specialists, however, they do experience higher stress levels in years with lower rainfall and higher median temperatures. This means the wildlife populations may be less able to withstand increased stress from poaching.

Here is a partial list of publications addressing the impact of Climate Change on Kenya specifically:

The Economic Impact of Climate Change on Kenyan Crop Agriculture: A Ricardian Approach Fredrick K. Karanja University of Nairobi, Jane Kabubo-Mariara University of Nairobi, August 1, 2007

World Bank Policy Research Working Paper No. 4334

CLIMATE CHANGE AND AFRICAN AGRICULTURE
Policy Note No. 12, August 2006, CEEPA
Centre for Environmental Economics and Policy in Africa (CEEPA)

Omenda, T.O., J.G. Kariuki, and P.N. Mbuthi, 1998: *Vulnerability and Adaptation to Potential Impacts of Climate Change in Kenya: Summary for Policy Makers*. Kenya Country Study Project, Ministry of Research and Technology, Nairobi, Kenya

Okoth-Ogendo, W.H.O. and Ojwang, J.B. (ed.), A Climate for Development: Climate Change Policy Options for Africa. ACTS press, Nairobi, 1995, p. 264.

Ottichilo, W.K., Kinuthia, J.H., Ratego, P.O. and Nasubo, G., Weathering the storm: Climate Change and Investment in Kenya, ACTS Press, Nairobi, 1991, p. 91.

Identify Risks to Project's CCB Benefits from Climate Change

Climate change in this area of Kenya is very likely to increase average temperatures, produce more frequent and prolonged droughts, and reduce the productivity of the traditional subsistence crops grown by local farmers. These farmers have low variability and diversity of crops, while being highly reliant on subsistence agriculture due to low-skills, lack of access to capital and low knowledge of other income generating activities. If not addressed, the decreased food productivity will have a detrimental effect on the local communities and therefore increase the pressure of poaching on wildlife. We are working hard to mitigate this risk by providing alternative livelihoods and the diversification of income sources, such as the EcoFactory, in our carbon project. Additionally, by researching drought tolerant cash crops that the local farmers can intercrop with their maize to provide a cash crop even in drought, such as jojoba.

It is also possible that severe prolonged droughts could lead to the degradation of natural food sources, such as grazing and forage for the wild animals. In addition, with the reduction in the number of herbivore species due to lack of browse, a corresponding reduction in predators would be expected.

Many of the wildlife species in this area are already drought specialists that can survive without water for months, it will put a lot of stress on most biodiversity living in the Project Area. These include giraffe, kudu, oryx, and gazelles, who acquire water through the browse they eat, and gerenuk who get water through a combination of browse and physiological design. Predators generally survive during droughts by living off the blood of their prey, and though territorial, have large territories and will follow their prey over large distances if necessary.

However, other wildlife species do require water sources during droughts, such as elephant, buffalo, eland, common zebra. The Project Area provides a safe corridor for these wildlife to migrate hundreds of kilometers to seek food and water between Tsavo East and Tsavo West

National Parks. We additionally have made the management decision to provide water at certain points throughout the sanctuary, to compensate for the permanent natural water points in the Project Zone that have been monopolized by humans excluding wildlife from use. The source of our water is the main water pipeline from Mzima Springs, which despite recent dry years, is still flowing at record rates. The springs have sufficient consistent water supply to provide for the drinking water needs of the 1,000,000 inhabitants of the City of Mombasa while also maintaining the permanent flow of the Tsavo River.

The availability of graze for those species that require it to eat could be further reduced during prolonged drought by the invasion of illegal cattle grazers, mostly Somali in search of grass for their cattle. This has been experienced from time to time historically on Rukinga, but this is an illegal act of trespass by tribes from outside the Project Area. These herders generally have no support from the community or local official administration and as such with adequate funding for patrolling we believe we can mitigate this risk. Recent drought has dramatically reduced the average herd size of the Somali commercial cattlemen, making it more likely that they will be able to find adequate grazing for their herds elsewhere. There is also the possibility that the geopolitical situation in Somalia that originally led to the use of the Project Area will improve. Somali cattlemen have been walking cattle from Somalia and Northern Kenya to be shipped from Mombasa to the Gulf States. Before shipment they would be fattened on the Project Area. With stabilization of Somalia the cattle can be exported directly from Somalia to the Gulf.

As this is an Avoided Deforestation project, with no climate benefits being claimed for net carbon stock increase from year-to-year in the project scenario, we do not anticipate any negative impacts on the emissions benefits of this project. The tree species present in the dryland forest are also drought specialists. Such as commiphora sp. that has the unique ability to photosynthesize through their bark, allowing them to drop all of their leaves during the dry season so as to prevent loss of water through transpiration. Acacia sp. drop up to 95% of their leaves for the same reason, but as they cannot photosynthesize through their bark they must keep 5% of their leaves even during drought for photosynthesis. Although the remaining leaves will fold in on themselves during the night so as to minimize the surface area for transpiration. Afforestation and reforestation projects would more likely face the risk of lower carbon stock increases if rainfall levels were further reduced as climate change continues, but we do not believe that the levels of unpredictability will have a significant impact on the survival of the mature indigenous dryland forest that forms the basis of the Project.

Demonstrate Current or Anticipated Climate Change impacts

Those climate change impacts mentioned above for the region are all equally applicable to the Project Area and Project Zone, so please see the section immediately above.

Demonstrate that Project Activities Will Mitigate Climate Change impacts

Wildlife Works' approach in the face of this threat has been to search for economic development opportunities that are sustainable and not dependent on the dry land forest. Our first initiative was to build a factory and teach the local women how to sew, a radical departure from traditional conservation thinking. This approach was designed to reduce the communities' dependence on slash and burn agriculture and other activities that lead to deforestation through the development of alternative income sources.

The expansion of our project to include revenues from carbon credit sales derived from the protection of the forest will increase the options for the creation of additional alternative, non-destructive jobs. This will enable us to employ more community members, and to further decrease the number of community members solely reliant on small subsistence agriculture.

The funding from carbon credit sales will additionally enable the expansion of our dryland-farming scheme. We are exploring the use of Jojoba, chili pepper and citrus trees as cash crops. These species have been selected since they can survive in very arid conditions with little to no water, and are much more productive per hectare than maize or the other annual crops traditionally grown by the community. As these crops require much less land, they can be irrigated from the existing pipeline, which the Kenyan government recently extended down into the villages around the Project Area. This would be highly beneficial in the event that natural rains fail for an extended period, and the income from the crops will justify to the farmers the additional expense of irrigation. This cannot be said for Maize, which is not a valuable enough crop to justify irrigation from the pipeline.

7 COMMUNITY

7.1 Net Positive Community Impacts (CM1)

Explain the justification of net positive community impacts (CM1.1-2):

Project Impact on Communities
From the start of this project, Wildlife Works has focused on methods that bring multiple benefits to the local communities from the conservation of natural resources, both forest and biodiversity. The measures of success within the community are both traditional metrics (e.g. number of employees, funds invested in the community, socio-economic improvement within the communities), and non–traditional (e.g. presence or absence of significant poaching by local community members, presence or absence of land pressure on the boundaries of the Project area). We have every reason to report that by all measures, traditional or non-traditional, the Project has had a substantial net-positive impacts on the community. Wildlife Works is not a typical NGO; we are a conservation business, and therefore do not have the skills, nor the impartiality to test this contention ourselves. However, numerous groups have visited Rukinga over the years to observe our model, and numerous surveys have been conducted. The most comprehensive study to date, conducted in August 2007, by an independent student researcher from the Netherlands, Marit Rietveld, is available upon request. Additionally, a second study conducted by a Swiss Ph.D student is available upon request.

- *Describe the impacts on communities (positive and negative), including all constituent socio-economic or cultural groups such as indigenous peoples, resulting from project activities and show that the net impacts are positive for the social and economic well-being of all community groups.*

In the spirit of brevity and non-redundancy, details concerning net-positive community impacts are discussed at length in Section 5.3 *Data and Parameters Monitored,* Section 2.2 Description of the Project Activity.

- *Demonstrate that no High Conservation Values related to community well-being have been negatively affected.*

Demonstration of no Negative Impacts on High Conservation Values

There are no negative impacts from the Wildlife Works project on HCV flora and fauna. On the contrary, we believe we have demonstrated a significant net-positive impact on endangered species habitat and wildlife populations. Furthermore, in regards to the community and the HCV species of Mt. Kasigau, which is regarded as the most important HCV area, we have an effective plan, (the Mt. Kasigau Reforestation Plan) to reforest the slopes of Mt. Kasigau. We will work closely with community groups, who will receive financial rewards for planting and sustaining 20,000 trees over a 3-year period. We are confident that this plan, which includes de-snaring and biodiversity monitoring by a community based organization, the Kasigau Development Trust (KDT), will result in a significant improvement to the HCV species of Mt. Kasigau. Details are described in the "Kasigau Biodiversity Monitoring Plan", and "Kasigau Biodiversity Survey Report", which are presented in Section 2.2.14.

7.2 Negative Offsite Stakeholder impacts (CM2)

Describe any negative offsite stakeholder impacts the project activities have caused and show that the project does not result in net negative impacts on the well-being of other stakeholder groups. Describe the implementation of measures to mitigate negative offsite social and economic impacts of the main stakeholders (see CM2.1-3).

Identify any Potential Negative Impacts on Offsite Stakeholders

We believe strongly that there are no **net** negative impacts on offsite stakeholders whatsoever, as there was no legal harvest of resources from the Project Area as the tree species are non commercial and only used in the local area by communities within the Project Zone. On the contrary we believe that Wildlife Works has had a very positive impact on offsite stakeholders, regionally in the Project Zone, nationally in Kenya, and internationally. Regionally, we have encouraged communities to set aside additional threatened land for conservation. Nationally, we have been recognized within Kenya for our innovative approach to balancing the needs of communities with the needs of wildlife. Internationally, the Kasigau Corridor Project has become a flagship conservation project that has elevated the idea of community based sustainable conservation to a new level on the global stage. As evidenced by the many large conservation organizations utilizing the example that Wildlife Works has set. This is shown by the popularity of the Wildlife Friendly Enterprise network (www.wildlifefriendly.org), of which Wildlife Works was a founding member.

However based on feedback from local communities during the development of this document a few areas of potential negative impact were identified and need to be addressed. These are:

- A potential increase in human-wildlife conflict as the wildlife populations return to Rukinga.
- An exclusive dependence on Wildlife Works for livelihood.
- A need for grazing within the community now that community cattle are excluded from grazing in Rukinga Sanctuary.
- A need for alternative farmland for the members of the Duruma community at the Coast of Kenya who are no longer migrating to Rukinga, because there is no longer unsecured land for them to squat on.

Plans to Mitigate Negative Impacts on Offsite Stakeholders

1) Potential increase in human-wildlife conflict

While there has certainly been a substantial increase in the amount of biodiversity on Rukinga Sanctuary since our arrival we believe that it has not resulted in a negative impact on the community for the following reasons:

- Prior to our arrival, even though the permanent population of wildlife on Rukinga was much lower than it is today, there was always human-wildlife conflict. At the time, elephants could not use Rukinga as a safe foraging habitat and were forced into the communities to look for food. Furthermore, in the search for water, elephants were often attracted to communities' water points, and would consequently damage or destroy pipes and taps while accessing the water.
- Wildlife Works has actively mitigated the potential negative impact of increased wildlife populations in several ways:

  a. First and foremost, the fact that Rukinga is now a safe habitat for wildlife, where we protect the natural resources there for wildlife, such as grazing grounds and water holes. Therefore, during the dry season elephants have less reason to go into the communities in the first place.
  b. Our rangers patrol the community boundary during those nights when the likelihood of elephant crop raiding is high, e.g. when crops are close to ready for harvest. They are on call to assist the community at any other time of year as needed. Also, they use "thunder flashes" to scare elephants from the boundary farms back into the Rukinga Sanctuary. This positive activity was acknowledged during the community surveys conducted by Marit Rietveld, and an independent Dutch researcher in 2007.
  c. We have provided the community with literally tens of thousands of free chili pepper bushes, grown in our organic greenhouse. This cash crop provides not only a potential income to the farmers, but also acts as a repellent to elephants that be planted as a barrier at the edge of their farms. This is based on research performed by Dr. Loki Osborn of ElePepper in Zambia, which has shown chili peppers to be an effective deterrent provided the farmers maintain the bushes.
  d. We are planning to introduce another non-conflict cash crop, jojoba, into the communities along our boundary during the first five years of the Project. Neither elephants, nor any other wildlife, feed on jojoba, which makes it a promising cash crop for farmers in a potential conflict area.
  e. Many members of the community are benefiting financially from the presence of wildlife on Rukinga through jobs in tourism and at Wildlife Works. The income they receive provides them with an alternative to subsistence farming of high wildlife conflict crops such as maize.

We believe that these mitigation activities have already proven to be successful over the years, and that with additional funding under the carbon program their effectiveness will only increase. Therefore, we do not believe that our project will create a net negative impact in human-wildlife conflict.

2) An exclusive dependence on Wildlife Works for livelihood
It is certainly true that Wildlife Works is the only significant employer in the community, but it is hard to see it as a net negative impact. We have not displaced any other employers or forms of employment within the community. We are however we are aware of the issue, and we are constantly looking for ways to bring more jobs into the community, to seed other companies to enter the area, and foster entrepreneurship. One example is the leasing of the eco-tourism facility on Rukinga to Camp Kenya, as well as the establishment of the new clothing factory SOKO in the EPZ. A further attempt to diversify the employment base is the expansion of organic greenhouses to the community and the promotion of the jojoba farming scheme planned under the Project Activities. This will reduce communities' dependence on Wildlife Works as the sole employer. We thus do not believe that our project will create a net negative impact in over dependence on Wildlife Works for jobs.

3) Need for grazing within the community
Livestock is an unsustainable lifestyle in this dry country, as there is no permanent water source other than expensive piped water. The local communities have discovered this, for all nearby tribes do not have a strong cultural attachment to cattle, like the Maasai or Samburu. Local tribes, such as the Taita and Duruma cattle herds are very small. Furthermore, the lack of suitable grazing land has far more to do with the constant presence of large and unsustainable herds of Somali cattle overgrazing all of the community land. The Somali were initially invited in by local community ranch owners, who were desperate for income. However, the ranch owners did not have the resources to monitor the Somali herds to ensure that they did not overstock the ranches and overgraze the resources. If Wildlife Works was not here, it is certain that these large herds of Somali cattle would also invade Rukinga in the short term. In order to manage incursions onto our sanctuary from these illegal Somali cattle we have had to implement a uniform policy against grazing of any cattle in the Rukinga Sanctuary. We are actively mitigating against the potential negative impacts of loss of grazing in the following ways:

- Assisting the community to diversify away from cattle as an asset class that has proven to be a liability in times of drought time and time again in this area of extremely low rainfall
- Carbon revenues will enable the surrounding community ranch owners to wean themselves from the dependence on Somali cattle income, so that they can allow their own lands to regenerate. This would provide for more grazing for their well managed herds in the future, as sustainable grazing of local cattle is perfectly consistent with management of these surrounding ranch lands for REDD, and even for biodiversity and ecotourism. This is provided sensible zoning is done to prevent the cattle herds from competing with wildlife for resources, or damaging the tourism experience for international visitors who come to see wildlife, not cattle.
- Assisting the local communities to use legal means to expel the illegal Somali cattle herds that have severely degraded the community lands. This could be accomplished using ranger patrols and the Kenyan courts to legally prohibit the continued exploitation of the local community by these large-scale commercial Somali cattle operations.

These mitigation activities will prove to be successful in the coming years, and that with additional funding under the REDD project their effectiveness will only increase. Therefore,

for these reasons this project will not create a net negative impact for the community from reduction of cattle grazing.

4) A need for alternative farmland for the Duruma from the Coast
This presents a stretch in Wildlife Works' responsibilities as a REDD Project Proponent, since this is based on a land tenure issue regarding a tribe that has no historical roots in the Project Zone. As such the coastal Duruma should not be considered Stakeholders in the Project. However, in the attempt to mitigate threats to the land, it has to be addressed. The Duruma that illegally squat on the Project Area are originally from the Coastal community, and thus come from well outside our Project Zone. However, they are looking for unprotected farmland anywhere they can find it. There is no particular attraction to the Dryland Forest of the Project Area, as the bush has to be cleared before farming can occur.

The Duruma that were already settled in the Project Zone when the Project began are considered stakeholders. Wildlife Works assisted in the formation of a new land cooperative, called the Sasenyi Valley Cooperative, where they could legally purchase ten acres of land for a very small price from a community managed cooperative on land subdivided from Rukinga for that purpose. Many chose to take up this opportunity, whilst others did not. We have also employed several Duruma as rangers, watchmen, and in the EcoFactory. We have also coordinated the funding and construction of two classrooms in a new Duruma primary school in Sasenyi Valley, the building of four classrooms at Kale, as well as the renovation of four classrooms at Buguta. These two schools have predominantly Duruma students. Lastly, with REDD project funding we plan to construct 2 of the new organic greenhouses, described in Project Activities sections above, in Sasenyi and Buguta, two Duruma communities. These will provide employment and free trees to these communities, who have generally deforested their land more aggressively than the Taita villages.

These activities will prove to successfully mitigate the need for additional Duruma farmland in the coming years. With additional funding under the carbon program their effectiveness will only increase. Therefore, this project will not create a NET negative impact within the Duruma Stakeholder community.

Demonstrate no NET Negative Impacts on other Stakeholder Groups

Please see the section above in which plans for mitigation are presented and in which it is described that we do not believe to have any net negative impacts to any Stakeholder Group as a result of our Project Activities.

7.3 Exceptional Community Benefits (GL2)

For projects that included this optional criterion in the project description, describe how the project is explicitly pro-poor in terms of delivering benefits to globally poorer communities and the poorer, more vulnerable households and individuals within them (see GL2.1-5).

Kenya is surprisingly just above the threshold for Low Development Countries with an HDI of 5.21 vs. a < 5.0 limit for Low Human Development Countries. As a result we have not claimed gold status for this criteria. However, the Project is in an extremely rural area of Kenya that would most likely qualify under the criteria of having 50% of residents below the poverty line.

8 BIODIVERSITY

8.1 Net Positive Biodiversity Impacts (B1)

Explain the justification for net positive biodiversity impacts (B1.1-5):

- *Describe the impacts on biodiversity (positive and negative) as a result of the project and show that the net impacts on biodiversity are positive.*

Impacts on Biodiversity

Since the beginning of the Project Wildlife Works has focused on methods of stopping the rampant killing of wildlife in the Kasigau Corridor and protecting the habitat for the wildlife to return. This killing has primarily been done by poachers seeking either animal products, such as elephant tusks, or bush meat. When Wildlife Works arrived at the Project Area over twelve years ago there were very few large mammals remaining. Our rangers used to say they saw nothing larger than a dikdik, a very small antelope. After a year of protecting the habitat, the wildlife began to return, including a substantial number of elephants.

We have been keeping a database of wildlife sightings and in fact report flora and fauna sightings in a yearly Biodiversity and Social Impact report. During the first years of Wildlife Works presence the absence of wildlife in the community lands and the low number of sightings in the Project Area displays the strength of the baseline scenario or “without-project”, there would be practically no wildlife left. Now, after many years of protection, the community ranches represent a well-balanced ecosystem. Because the Project Area is semi-arid, the density of wildlife will always be relatively low. With the carbon credit funding, we have been able to establish a formal Biodiversity monitoring team and build a monitoring camp for the express purpose of tracking and monitoring the conservation of biodiversity. With this conservation being directly attributed to the protection of the ecosystem, which is of course funded through the sale of carbon credits.

However, scientifically accurate wildlife counts are incredibly difficult to carry out and obtain anywhere in the world, especially in forests. It is common practice to measure biodiversity simply by presence or absence of species, and by evidence of obvious poaching. The Kenya Wildlife Service conducts an official count of elephant in the Tsavo ecosystem every other year. The Project Area is included in this count, and in fact Rob Dodson, the VP of African Operations is a key participant in the count itself. This inclusion supports the fact that the Project Area is a key elephant habitat in the Tsavo area, and that the Kasigau Corridor is a valuable wildlife dispersal area and important for the overall health of the ecosystem.

In addition, Wildlife Works has initiated many activities within the Project Area to foster broader conservation efforts outside the Project Area. There are endemic species of high conservation value on Mt. Kasigau and the Taita Hills. Many of these species, however, persist in small and highly isolated (sub) populations. Consequently, a high proportion are of immediate conservation concern as is reflected by the list of 34 Taita animal and plant species currently categorized as vulnerable, endangered or critically-endangered by IUCN Red List Criteria (Luc Lens et al, 2002). That said, some are benefitting directly from increased conservation awareness such as Klassen’s aloe, found at the Southern end of the Project Area.

Identification of Species Used by Project

This is not applicable to this project as it is 100% a conservation project with no off-take of any kind. The reforestation efforts that are part of our leakage mitigation use only slow growing native hardwood species for planting in wildlands. The agroforestry species are planted only within the confines of communities, and are selected for their non-invasive characteristics (reference search engine at http://www.issg.org/database). Additionally, agroforestry species have generally been present within the communities already, e.g. Neem, Moringa. Citrus. A detailed species lists of tree nursery projects follows.

The indigenous tree species to be planted are:

	Common name	Latin name
1.	Mkwachu	*Tamarindus indica*
2.	Kirumbutu	*Melia Volkensii*
3.	Mchemeri	*Acacia nilotica* (Egyptian Thorn)
4.	Acacia Robusta	
5.	Kiburabura (swa)	*Prunus africana*
6.	Mshogoreka	*Terminalia brownii*
7.	Iti	*Acacia tortilis*
8.	Chariso	*Boscia coriacea*
9.	Mzwana	*Berchemia discolor*
10.	Mbokoi	*Melita Oblata*
11.	Mwarara(swa)	*Acacia brevispica* (Wait a bit)
12.	Kikwata	*Acacia melifera*
13.	Gum arabica	*Acacia arabica*
14.	Mwasina	*Kigelia africana*
15.	Umbrella Thorn	*Acacia abyssinica*
16.	Mshigha	*Lannea schweinfurthii*
17.	Mhina	*Lawsonia inermis*
18.	Mlamba	*Adansonia digitata*

The non-native tree species used in the jojoba project are:

1.	Jojoba	*Simmondsia chinensis*

Jojoba is grown for the seeds, which provide a valuable cash crop for local farmers. It is very slow growing, takes approximately 5-8 years to produce seed and the seedlings require a lot of support in the early growth phase, due to the dry climate in the area. Over the years Wildlife Works has been present in the Project Area, we have seen no examples of Jojoba self-sowing. Jojoba is not eaten by any animals or birds due to the appetite suppression qualities of the seeds, so it carries no threat of natural seed dispersal. There are no native equivalents to Jojoba.

The non-native tree species used in the greenhouse project are:

1.	Morabaini, Neem	*Azadirachta indica*

Neem was introduced to East Africa from India long ago, and has become widespread within Kenya. It has many valuable uses, one of which is to combat malaria. Farmers and communities have planted it for a very long time. Its Swahili name means "40 uses", which include insect repellant, dietary supplement, medicinal tea etc. There are no native equivalents to Neem. Neem

is also non-invasive.

2. Moringa *Moringa oleifera*

Moringa is considered native to Kenya, but in fact was also introduced to East Africa from India a long time ago. It is now widespread within Kenya, and has many valuable uses, and as such has been planted by farmers and communities for a very long time. Moringa is non-invasive.

3. chili-pepper *Capsicum chinense*
4. mango *Mangifera Indica*
5. orange(pixie, mineola, Washington navel etc.) *Citrus sinensis* var. grafted onto *Citrus jambhiri* Lush. (rough lemon) rootstock
6. Papaya *Carica papaya*
7. Passion Fruit *Passiflora edulis* SIMS

Wildlife Works propagates citrus fruit trees on native rough lemon rootstock, using grafting techniques. Rough lemon rootstock is drought resistant, termite resistant and deep rooted. They are then out planted in community farms as a cash crop, or in the case of the chili pepper, as a barrier to elephant crop-raiding as well as a cash crop. The climate in the Kasigau corridor is too dry for any of these species to self-sow in the wild; they all require significant maintenance as seedlings before being out-planted into farms, and therefore they cannot be considered invasive. The citrus species cannot survive drought at all, and must be watered regularly by the farmer. They do, however, produce a valuable cash crop that offsets the water costs. The chili pepper is relatively drought tolerant, but very short lived, with bushes living no more than four years in this area. Both Mango and Citrus can be considered naturalized species in Keya. There are records of the first sweet oranges known to the western world being given to Vasco da Gama in 1499 in Milindi at the Kenyan Coast. Mango trees have also been present in East Africa for hundreds of years.

None of these species have any recorded entries in the global invasive species database (http://www.issg.org/database). Passion Fruit was introduced commercially to Kenya in 1933, but large plantations were devastated several times by easily spread diseases and pests. It became necessary to abandon them in favor of small and isolated plantings, which could be better protected. Papaya has been extensively grown for centuries in Kenya, most likely arriving with Portuguese trading ships. There are no native equivalents to these valuable cash crops. While they do introduce potential human-wildlife conflict, it is much easier for the community to defend a fruit tree, than a field of maize.

Describe Invasive Species Used by Project

None. Ref: global invasive species database (http://www.issg.org/database).

- *Demonstrate that no High Conservation Values related to biodiversity have been negatively affected. Describe all species used by the project and show that no known invasive species have been introduced or increased.*

Demonstration of no HCVs Negatively Impacted

Once again, protecting project HCV species are the core of our activities on the Project Area, so none will be adversely affected by the Project. On the contrary, our primary aim is to protect biodiversity, both flora and fauna alike. The conservation of biodiversity is our mission.

- *Describe any adverse effects of non-native species used by the project, and guarantee that no genetically modified organisms (GMOs) have been used to generate GHG emissions reductions or removals.*

No GMO Guarantee

We guarantee that no GMOs are used ever in the course of Wildlife Works' projects, and therefore would never be used to generate emissions reductions or removals.

8.2 Negative Offsite Biodiversity Impacts (B2)

Describe any negative offsite biodiversity impacts that the project activities have caused. Describe the implementation of measures to mitigate negative offsite biodiversity impacts (see B2.1-3).

The Project does not have any negative offsite biodiversity impacts. As described in the above sections the Kasigau Project has significant positive impacts on biodiversity by any dimension that could be analyzed.

8.3 Exceptional Biodiversity Benefits (GL3)

For projects that included this optional criterion in the project description, describe how the project is conserving biodiversity at sites of global significance for biodiversity conservation (see GL3.1-2.4).

Demonstrate the Project Zone Includes a site of High Biodiversity Conservation Priority

The Project Zone meets these criteria under the Vulnerability criteria for the following reasons:

- Rukinga has a resident population of Grevy's zebra (*Equus grevyi*) which is an IUCN Red List – Endangered. In fact Rukinga may have up to 3% of the global population, which is estimated at 750 in 2008.
- The Rukinga Sanctuary is part of the home range of a pack of African Hunting Dogs (*Lycaon pictus*) that have been photographed on the sanctuary - which is IUCN Red List – Endangered.
- Rukinga has a significant resident population of both cheetah (*Acinonyx jubatus*) and lion (*Panthera leo*) that are IUCN Red List – Vulnerable. The population is believed to be greater than 30 individuals. If the greater Project Zone is included then the populations are definitely greater than 30.
- The Project Area is part of the Eastern Arc Mountain Global Hot Spot as defined by Conservation International, and in the Project Zone, outside the Project Area, are several other qualifying species such as:
  - Taita Apalis (*Apalis fuscigularis*) – IUCN Critically Endangered
  - Taita Thrush (*Turdus helleri*) – IUCN Critically Endangered

9 ADDITIONAL INFORMATION

May include any raw data from monitoring, additional information used in the monitoring plan, documentation of activities conducted from the monitoring plan, diagrams, etc.

9.1 List of Allometric Equations

$f_{sp}(\cdot)$ Allometric equation for species sp. For trees, this equation generally is based on dbh and possibly height to biomass.
All Equations follow the following format**:**

- If the tree DHB is less than 35cm, the following format is used

$$\boldsymbol{B_i = a \cdot DBH^b}$$

where $\boldsymbol{B_i}$ is the Biomass of the tree calculated by the allometric equation;
DBH is the Diameter at Breast Height for the corresponding tree and
a and ***b*** are the allometric constants listed in the table below.

These power equations are based on regression of DBH vs. Biomass data obtained through a destructive harvest conducted by Wildlife Works at Rukinga HQ, but outside the Project Area.

- If the tree DBH is greater than or equal to 35cm, the following format is used

$$\boldsymbol{B_i = c \cdot DBH - d}$$

Where $\boldsymbol{B_i}$ is the Biomass of the tree calculated by the allometric equation;
DBH is the Diameter at Breast Height for the corresponding tree and
c and ***d*** are the allometric constants listed in the table below.

These linear equations are based on the slope of a line drawn at the tangent of the all-species curve at 35cm DBH. For more information regarding the allometric model applied to this project, please see the VCS PD, Section 13 Monitoring. Note that a CAR was issued for Phase II of the Kasigau Corridor Project during the initial project validation/verification resulting in the wholesale changing of the allometric model to incorporate linear models that are to be employed if a tree is measured greater than 35cm DBH. This change was then applied to the Phase I Project as well (this project). The details of this change can be found both in the Phase II CARs (Phase II CAR 13) as well as the VCS Phase II PD, Section 13 Monitoring.

Table of Allometric Constants

Species	< 35cm constant A	< 35cm constant B	> 35cm constant C	> 35cm constant D
Acacia bussei	3.380	1.642	80.292	1056.633
Acacia etbaica	1.142	1.995	80.292	1251.187
Acacia hockii	0.685	2.182	80.292	1205.526
Acacia mellifera	1.142	1.995	80.292	1251.187

Acacia melifera	1.142	1.995	80.292	1251.187
Acacia nilotica	1.362	1.951	80.292	1228.467
Acacia senegal	1.142	1.995	80.292	1251.187
Acacia thomasii	1.142	1.995	80.292	1251.187
Acacia tortilis	2.606	1.618	80.292	1274.403
Acacia zanzibarica	1.142	1.995	80.292	1251.187
Albizia anthelmintica	0.341	2.302	80.292	1551.378
Albizia harveyi	0.341	2.302	80.292	1551.378
Balanites aegyptiaca	0.341	2.302	80.292	1551.378
Balanites pedicellaris	0.341	2.302	80.292	1551.378
Boscia angustifolia	0.341	2.302	80.292	1883.692
Boscia coriacea	0.203	2.365	80.292	1883.692
Boswellia neglecta	1.303	1.833	80.292	1994.440
Cassia abbreviata	0.341	2.302	80.292	1551.378
Cassia siamea	0.341	2.302	80.292	1551.378
Cassipourea celastroides	0.341	2.302	80.292	1551.378
Commiphora africana	0.629	1.946	80.292	1622.071
Commiphora baluensis	0.105	2.665	80.292	1250.566
Commiphora campestris	0.068	2.816	80.292	1015.801
Commiphora confusa	0.115	2.663	80.292	1360.983
Commiphora edulis	0.105	2.665	80.292	1250.566
Commiphora eminii	0.105	2.665	80.292	1250.566
Commiphora holtziana	0.105	2.665	80.292	1250.566
Croton pseudopulchellus	0.341	2.302	80.292	1551.378
Delonix elata	0.341	2.302	80.292	1551.378
Diosporus consolatae	0.341	2.302	80.292	1551.378
Diospyros consolatae	0.341	2.302	80.292	1551.378
Erythrina abyssinica	0.341	2.302	80.292	1551.378
Euphorbia bussei	0.341	2.302	80.292	1551.378
Euphorbia quinquecostata	0.341	2.302	80.292	1551.378
Euphorbia tirucalli	0.341	2.302	80.292	1551.378
Haplocoelum foliolosum	0.341	2.302	80.292	1551.378
Lannea alata	0.560	2.103	80.292	1148.344
Lannea rivae	0.149	2.642	80.292	1058.718

Lannea schweinfurthii	0.329	2.323	80.292	1127.474
Manilkara mochisia	0.341	2.302	80.292	1551.378
Manilkara sulcata	0.341	2.302	80.292	1551.378
Melia volkensii	0.341	2.302	80.292	1551.378
Melia volkensil	0.341	2.302	80.292	1551.378
Mellia volkensii	0.341	2.302	80.292	1551.378
Newtonia hildebrandtii	0.341	2.302	80.292	1551.378
Pittosporum viridiflorum	0.341	2.302	80.292	1551.378
Platycelyphium voense	0.341	2.302	80.292	1551.378
Salvadora persica	0.341	2.302	80.292	1551.378
Sterculia africana	0.341	2.302	80.292	1551.378
Teclea divinorum	0.341	2.302	80.292	1551.378
Terminalia prunoides	0.341	2.302	80.292	1551.378
Terminalia spinosa	0.341	2.302	80.292	1551.378
Vepris simplicifolia	0.341	2.302	80.292	1551.378
Zanthoxyllum chalybeum	0.341	2.302	80.292	1551.378

9.2 Mass-equivalent bulk density of fine portion of soil sample, ρ_{soil}.

	Rukinga			Reference	
Project plot	**bulk density (g/cm^3) 0-30cm**	**bulk density (g/cm^3) 31-100cm**	**Reference plot**	**bulk density (g/cm^3) 0-30cm**	**bulk density (g/cm^3) 31-100cm**
1	1.38	1.21	1	1.57	1.42
2	1.23	1.33	2	1.43	1.36
3	1.34	1.13	3	1.31	1.29
4	1.22	1.35	4	1.53	1.38
5	1.3	1.33	5	1.57	1.36
6	1.39	1.38	6	1.45	1.41
7	1.39	1.25	7	1.43	1.38
8	1.2	1.36	8	1.43	1.31
9	1.38	1.4	9	1.69	1.52
10	1.33	1.42	10	1.5	1.47
11	1.37	1.21	11	1.51	1.37
12	1.3	1.25	12	1.5	1.43
13	1.25	1.35	13	1.52	1.42

14	1.34	1.4	14	1.58	1.46
15	1.31	1.34	15	1.48	1.42
16	1.38	1.52	16	1.53	1.39
17	1.44	1.33	17	1.56	1.41
18	1.22	1.26	18	1.33	1.57
19	1.21	1.29	19	1.57	1.5
20	1.34	1.45	20	1.59	1.5
21	1.3	1.59	21	1.54	1.29
22	1.5	1.36	22	1.56	1.38
23	1.39	1.45	23	1.34	1.28
24	1.36	1.28	24	1.51	1.45
25	1.24	1.26	25	1.55	1.44
mean	**1.32**	**1.34**		**1.50**	**1.41**

9.3 Mass-equivalent bulk density of fine portion of soil sample, $cf_{soil,j,k}$

Rukinga plot	Carbon fraction (0-30cm)	Carbon fraction (31-100cm)
75	0.5930	1.6977
53	1.4709	0.7442
40	1.0872	1.8953
45	1.4942	0.6860
54	0.5872	0.8256
81	0.6105	1.0988
63	0.3837	0.7151
71	0.5174	0.6047
19	0.4419	0.7965
3	0.4012	0.8547
56	0.6512	1.2791
23	0.6512	1.0523
24	0.6860	0.9826
10	0.5233	0.7151
48	0.8721	0.6453
22	1.1279	0.5465
112	0.3488	0.7849
76	0.5407	1.3895
35	1.1919	1.1221

82	0.5407	0.7326
66	0.6744	0.5872
59	0.4767	1.0698
9	0.6221	0.4651
84	0.4360	0.8140
46	0.5058	0.9826
mean:	**0.6974**	**0.9235**

This table represents SOC % (carbon fraction) for each plot sample collected within the Rukinga Ranch (Project Area). Sample values were evaluated for both 0-30cm and 31-100cm at each plot. These 2 values were later combined to obtain total soil loss (which also requires measurement of soil outside the Project Area).

Mean carbon · ha^{-1} for the Project Area: **411.53 t CO_2e · ha^{-1}**
(for details on this calculation, please see the Soil Carbon calculation Worksheet 'Rukinga Deep 1m Soil Analysis - RA V2.1.xls') also listed at the end of this document.

9.4 Degradation proportion observation taken in each leakage plot i^{th} sample point at monitoring period m, $o_i^{[m]}$.

Plots	Point X	Point Y	Degradation % Dec, 2010 (t=0)	Factor 2010	Degradation % Nov, 2011 (m_2)	Factor 2011	Degradation % Nov, 2012 (m_3)	Factor 2012
L01	462290.6	9566407.4	0.1-20	0.2	60.1-80	0.8	40.1-60	0.6
L02	459730.6	9572807.4	40.1-60	0.6	80.1-100	1	60.1-80	0.8
L03	458450.6	9583047.4	20.1-40	0.4	60.1-80	0.8	40.1-60	0.6
L04	464850.6	9584327.4	0	0	40.1-60	0.6	60.1-80	0.8
L05	469786	9572839	20.1-40	0.4	60.1-80	0.8	40.1-60	0.6
L06	464287	9584462	60.1-80	0.8	80.1-100	1	60.1-80	0.8
L07	466596	9583913	20.1-40	0.4	0.1-20	0.2	20.1-40	0.4
L08	460305	9572376	60.1-80	0.8	40.1-60	0.6	40.1-60	0.6
L09	460640	9572657	60.1-80	0.8	60.1-80	0.8	60.1-80	0.8
L10	472530.6	9602247.4	0.1-20	0.2	0.1-20	0.2	0.1-20	0.2
L11	457170.6	9603527.4	60.1-80	0.8	80.1-100	1	80.1-100	1
L12	472530.6	9603527.4	0.1-20	0.2	0.1-20	0.2	0.1-20	0.2
L13	486859.7	9593065.8	0.1-20	0.2	0.1-20	0.2	20.1-40	0.4
L14	482453.6	9592769.8	20.1-40	0.4	20.1-40	0.4	0.1-20	0.2
L15	485034.1	9591786.5	40.1-60	0.6	0.1-20	0.2	20.1-40	0.4
L16	461010.6	9611207.4	40.1-60	0.6	80.1-100	1	60.1-80	0.8
L17	448210.6	9612487.4	20.1-40	0.4	80.1-100	1	60.1-80	0.8
L18	479344.8	9595139.2	20.1-40	0.4	60.1-80	0.8	40.1-60	0.6
L19	457170.6	9618887.4	0.1-20	0.2	40.1-60	0.6	60.1-80	0.8
L20	443090.6	9640647.4	0	0	40.1-60	0.6	20.1-40	0.4
L21	441810.6	9648327.4	0	0	0.1-20	0.2	0.1-20	0.2
L22	481307.2	9593867.3	0.1-20	0.2	20.1-40	0.4	0.1-20	0.2
L23	481598.5	9594812.8	20.1-40	0.4	40.1-60	0.6	20.1-40	0.4
L24	484344.9	9592969.2	0.1-20	0.2	0.1-20	0.2	20.1-40	0.4

L25	484231.9	9593633.8	20.1-40	0.4	0.1-20	0.2	20.1-40	0.4
L26	487579.8	9593521.9	0.1-20	0.2	0.1-20	0.2	20.1-40	0.4
L27	486771.0	9594064.8	0.1-20	0.2	0.1-20	0.2	0.1-20	0.2
L28	448401.6	9613947.0	60.1-80	0.8	80.1-100	1	80.1-100	1
L29	446810.4	9609307.4	60.1-80	0.8	80.1-100	1	60.1-80	0.8
L30	446012.1	9612379.7	40.1-60	0.6	60.1-80	0.8	40.1-60	0.6
L31	449457.4	9613888.1	20.1-40	0.4	60.1-80	0.8	60.1-80	0.8
L32	470359.3	9573125.2	60.1-80	0.8	80.1-100	1	40.1-60	0.6
L33	471130.8	9572882.0	40.1-60	0.6	MISSING		20.1-40	0.4
L34	465491.1	9583961.7	20.1-40	0.4	20.1-40	0.4	0.1-20	0.2
L35	465407.2	9584618.5	20.1-40	0.4	20.1-40	0.4	20.1-40	0.4
L36	464821.6	9585006.8	0.1-20	0.2	40.1-60	0.6	40.1-60	0.6
L37	470989.6	9573694.4	40.1-60	0.6	80.1-100	1	40.1-60	0.6
L38	470380.8	9573910.4	20.1-40	0.4	60.1-80	0.8	60.1-.80	0.8

Annex 1
Annual Human Resources Report

Year	Quarter	Month	Management	Office	EcoFactory	Rangers	Workshop	Security (watchmen)	Greenhouse	Housekeepers	Soap Factory	Carbon Sampling	Jojoba Project	Total Permanent	No Locals	No Non-local	Payroll Cost	No Casuals	Casuals Cost	Total Employees	Total Salaries
2010	1	January	5		22	18	2	11	4	2	1			65	64	1	655079	9	47300	74	702379
	1	February	5		22	18	2	11	4	2	1			65	64	1	654808	11	61000	76	715808
	1	March	5		22	18	2	11	4	2	1			65	64	1	684741	8	41200	73	725941
	2	April	7	2	8	27	2	7	4	2	1			60	59	1	892967	12	55600	72	948567
	2	May	7	2	8	27	2	7	4	2	1			60	59	1	885787	13	68120	73	953907
	2	June	7	2	8	27	2	7	5	2	1			61	58	3	878790	13	66709	74	945499
	3	July	7	2	8	27	2	10	5	2	1			64	61	3	913108	12	60353	76	973461
	3	August	7	2	8	27	2	10	5	2	1			64	61	3	982525	14	73270	78	1055795
	3	September	7	2	10	27	2	10	5	5	1			69	66	3	955022	17	99562	86	1054584
	4	October	7	2	13	66	3	9	9	5	1			115	112	3	1616697	15	76350	130	1693047
	4	November	7	2	14	66	3	10	8	5	1			116	113	3	1583703	18	107069	134	1690772
	4	December	7	3	15	66	3	10	8	5	1			118	115	3	1682127	23	128894	141	1811021
2011	1	January	7	3	15	66	3	10	8	5	1			118	115	3	1721096	24	137390	142	1858486
	1	February	7	4	17	65	3	10	8	5	1			120	116	4	1781426	32	410662	152	2192088
	1	March	7	4	18	73	3	10	8	5	1			129	125	4	1885073	34	438140	163	2323213
	2	April	7	6	18	73	3	10	8	5	1	11		142	138	4	2051	39	5114	181	2562729

																	277		52	
	2	May	7	6	18	73	3	10	9	5	1	11	1	144	140	4	2070 928	41	3212 00	184	2392128
	2	June	7	6	18	73	3	10	16	5	1	11	1	151	147	4	1988 045	99	3269 18	249	2314963
	3	July	8	9	19	72	14	10	15	6	1	11	1	166	163	3	2888 771	41	5452 65	206	3434036
	3	August	8	9	21	72	19	10	15	6	1	11	1	173	170	3	2870 434	131	6082 57	303	3478691
	3	September	8	10	21	72	19	10	15	6	1	10	1	173	170	3	2896 699	129	5944 91	301	3491190
	4	October	8	10	21	72	19	10	15	6	1	10	1	173	170	3	3040 069	92	6277 96	264	3667865
	4	November	9	11	22	72	15	10	15	6	1	11	1	173	168	5	3837 544	92	4122 53	264	4249797
	4	December	9	11	25	72	15	14	15	6	1	11	1	180	175	5	4106 658	90	4564 61	269	4563119
2012	1	January	9	11	26	72	15	14	15	6	1	11	1	181	178	3	3618 069	123	5256 75	303	4143744
	1	February	9	12	29	73	16	12	15	6	1	11	1	185	182	3	3689 494	118	8588 31	302	4548325
	1	March	9	12	28	75	16	12	15	6	1	11	1	186	183	3	3663 851	115	8991 00	300	4562951
	2	April	9	8	36	73	16	14	13	4	0	15	1	189	185	4	3137 886	116	8231 69	304	3961055
	2	May	9	9	30	73	17	15	13	4	0	15	1	186	182	4	3251 301	117	1001 481	302	4252782
	2	June	10	11	62	73	18	18	15	4	0	15	1	227	223	4	3603 759	121	7381 05	347	4341864
	3	July	10	10	64	75	18	16	15	4	0	16	1	229	225	4	4014 419	79	6853 81	307	4699800
	3	August	11	12	66	76	22	16	15	8	0	15	1	242	238	4	4828 275	74	6389 04	315	5467179
	3	September	13	12	62	81	23	18	23	15	0	19	1	267	263	4	6288 872	90	5459 20	356	6834792
	4	October	13	12	61	81	24	19	24	15	0	15	1	265	260	5	6469 134	134	7560 91	398	7225225
	4	November	14	13	66	81	24	19	23	16	0	16	1	273	268	5	6598 660	152	1241 415	424	7840075

4	December	14	12	66	81	27	21	23	16	0	16	1	277	272	5	7193 175	117	5799 65	393	7773140