i. Project Name

The Kasigau Corridor REDD+ Project Phase I - Rukinga Sanctuary

ii. Project Location (country, sub-national jurisdiction(s))

Kenya, Taita Taveta County, Coast Province

iii. Project Proponent (organization and contact name with email address and phone number)

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

iv. Auditor (organization and contact name with email address and phone number)

SCS Global Services, Francis Eaton
Tel: +1-510-452-9099
Email: FEaton@scsglobalservices.com

v. Project Start Date, GHG Accounting Period and Lifetime

The Project Start Date is January 1st, 2005. The project crediting period (GHG accounting period) started on January 1st, 2005 and will end on December 31st, 2034. The Project has a lifetime of 30 years.

vi. The Project Implementation Period Covered by the PIR

This monitoring period (project implementation period) (M_4) is the fourth monitoring period and started on January 1st, 2013 and ended on December 31st, 2014.

vii. History of CCB Status including Issuance Date(s) of Earlier Validation/Verification Statements etc.

CCB Validation: 22 December 2009
CCB Verification M1: 5 December 2012
CCB Verification M2: 23 May 2013

viii. The Edition of the CCB Standards being used for this Verification

The Kasigau Corridor REDD+ Project Phase I - Rukinga Sanctuary was validated under the CCB Standards Version 2. This Project verification will be completed under the CCB Standards Version 2.

ix. A Brief Summary of the Climate, Community and Biodiversity Benefits Generated by the Project Since the Project Start Date and During the Current Implementation Period Covered by the PIR

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary *(*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. This is an average approximately 1.3 million metric tonnes per year across the carbon pools of

above and belowground biomass (forest carbon), and soil carbon. During the current M_4 monitoring period (January 1st, 2013 – December 31st 2014) through the continued protection of the Project Area the Project had a gross emission of 500,831 t CO_2e, for a total of 2,446,570 t CO_2e gross emission reduction since the Project Start Date.

The Project ecosystem 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 has continued to protect and enhance this biodiversity through anti-poaching patrols by the Wildlife Works Rangers and specific human-wildlife conflict alleviation programs. During this monitoring period the Wildlife Works Rangers were boasted by the hiring of 7 additional full-time staff. While 2013 showed a slight increase in the number of overall incidents and specifically animal poaching (mostly elephant), in 2014 the number of incidents showed a significant decline in both categories.

Since the Project Start the Project has provided significant community benefits. This includes serving as major source of local employment through both the clothing Eco-Factory, the Wildlife Works Rangers and general Project employment. Additionally, the Project has provided thousands of school bursaries to community children each year, and provided significant funding for school building construction, renovation and improvements to improve the learning facilities of community children. The Project has developed several programs for the growth and suply of both fruit trees and indigenous tree species for the re-forestation of the area. The Project has additionally started several other programs to supply employment and reduce resource pressure on the Project Area, such as the soap factory and the Eco-Charcoal program. During the current M_4 monitoring period (January 1st, 2013 – December 31st 2014) the Project has provided significant community benefits. This includes providing full time permanent employment to over 350 people with many additional people hired on a casual daily basis. The Project has provided significant educational community benefits, including school bursary's to over 14,000 primary, secondary and University students, and funding over $125,000 USD in school building renovations and improvements. During this monitoring period the Project also funded 7 community water projects and provided over 8,500 fruit and indigenous tree species to be planted in the communities.

x. Which Optional Gold Level Criteria are Being Used and a Brief Summary of the Exceptional Benefits Generated by the Project to Meet the Requirements of Each Relevant Gold Level

The Kasigau Corridor REDD+ Project Phase I - Rukinga Sanctuary has achieved Gold Level for both its provision of Climate Change Adaptation Benefits and its Exceptional Biodiversity Benefits.

Climate Change Adaptation Benefits

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.

Exceptional Biodiversity Benefits

- 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

xi. Date of Completion of this Version of the PIR, and Version Number as Appropriate.

This joint Monitoring Repot and Project Implementation Report (PIR) was completed on August 28th, 2015 and is version number 1.9.

The Kasigau Corridor REDD+ Project

Phase I - Rukinga Sanctuary

4TH MONITORING REPORT (M_4)

Document Prepared by Jeremy T. Freund and Simon C. Bird

Wildlife Works

jeremy@wildlifeworks.com, simon@wildlifeworks.com

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Prepared By	Jeremy T. Freund, VP Carbon Development
Contact	242 Redwood Hwy. Mill Valley, CA 94941 | (415) 331-4610 | www.wildlifeworks.com

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1 GENERAL

1.1 Summary Description of the Project (G3.1)

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary *(*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.

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 REDD+ 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 (G1.1, G1.3 & G3.3)

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary 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 – Upon a Visit to Tsavo and the Taita Highlands – The Geographical Journal 1895 Vol 5 No 6 pp 545-561]

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.

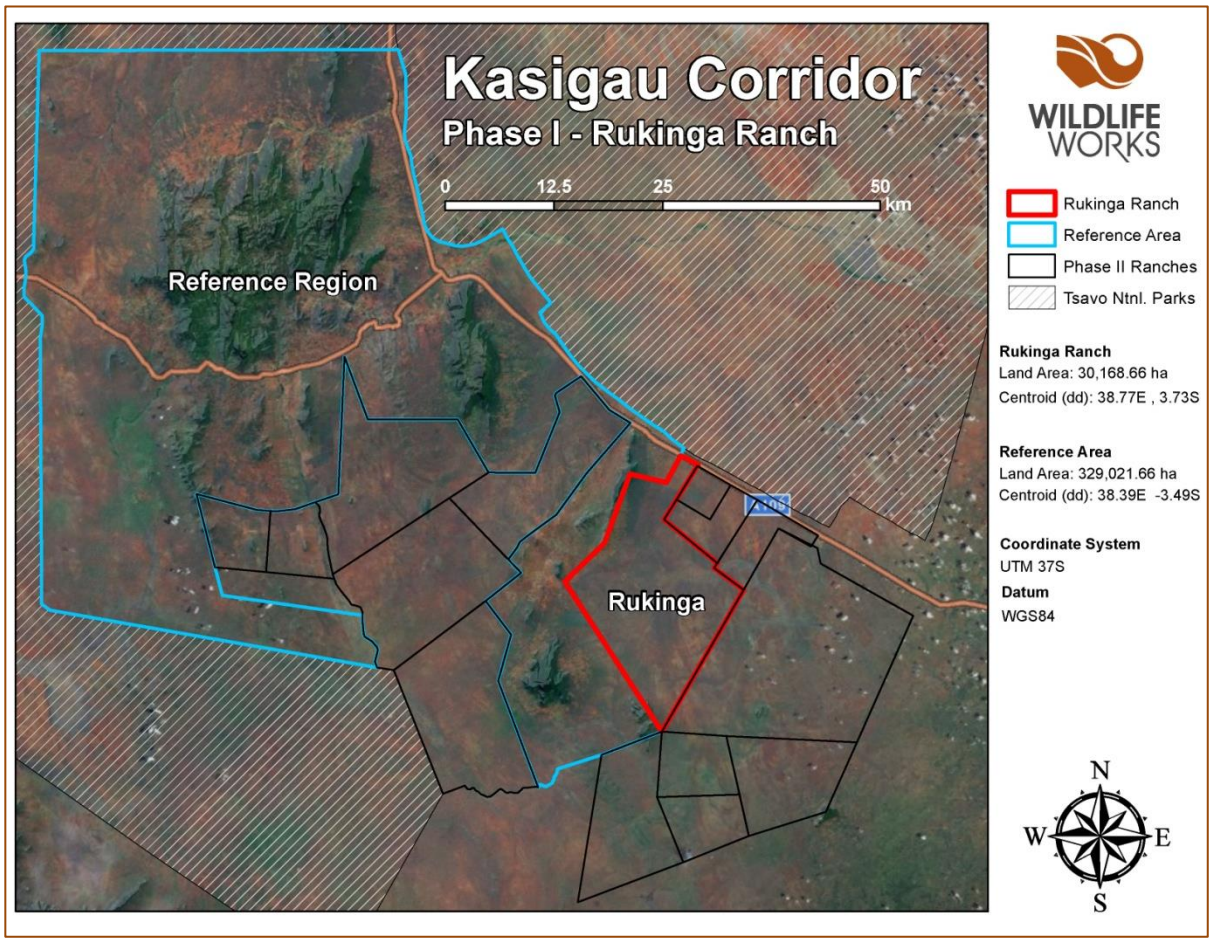


Figure 1: The Kasigau Corridor REDD Project Phase I - Rukinga Sancturay Project Area and Reference Region Spatial Boundaries

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.

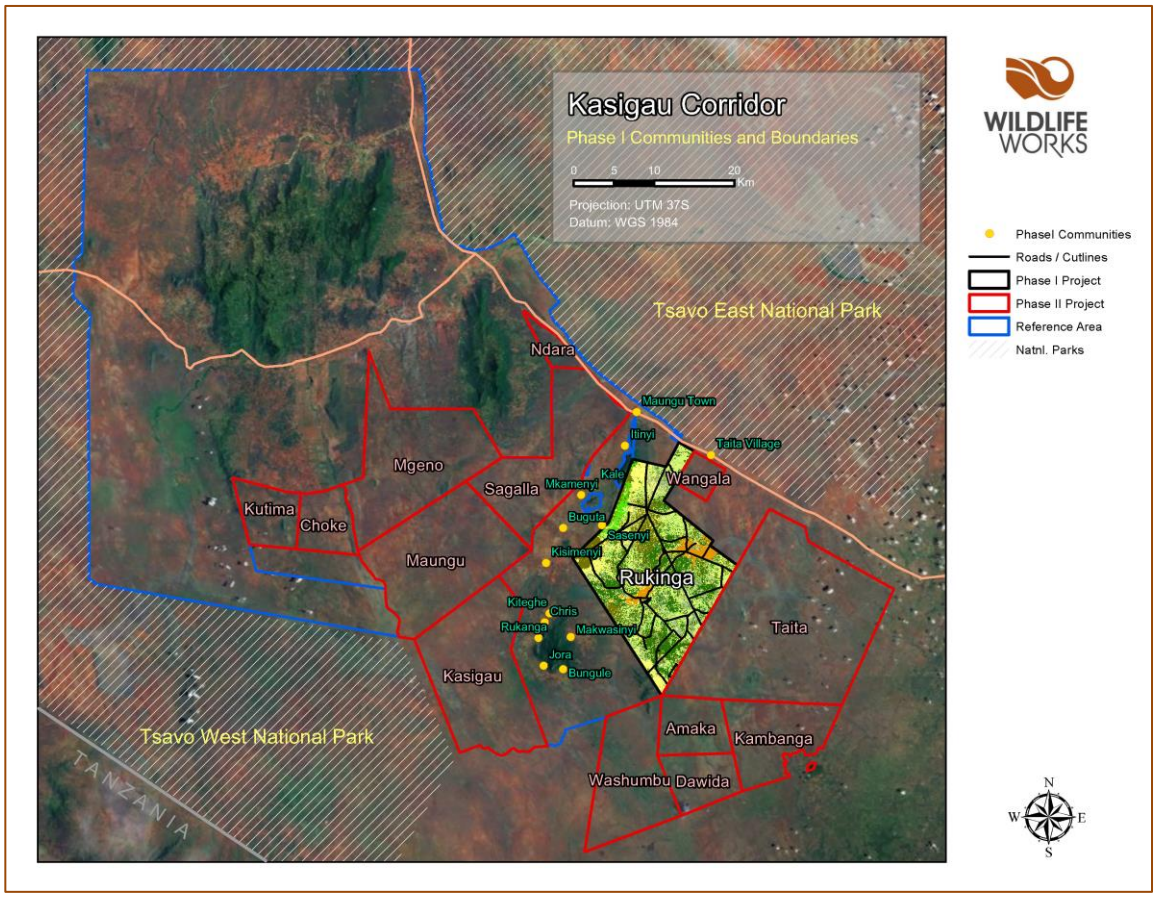


Figure 2: Communities within the scope of influence of the Phase I Project.

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 REDD+ Project Area, and are home to remnant patches of montane cloud forest, and to several endemic bird and flora species.

1.3 Project Proponent (G4.1)

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

1.4 Other Entities Involved in the Project (G4.2)

Please see section 1.3 above.

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:



Finance Manager – **Philip Thuo Njoroge**
Philip Thuo Njoroge joined Wildlife Works in March 2014, as finance manager. He oversees the day to day running of finance department and supports the nine departments involved in running the Kasigau REDD+ Project. Philip is a Certified Public Accountant with 18 years of financial experience gained in the private sector. Philip is also a part of the team that disburses the funds through the Wildlife Works Carbon Trust to Locational Carbon Committee (LCC).

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**

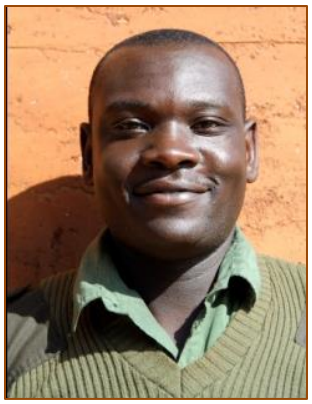
Mwachofi joined Wildlife Works in 2012. He is a Taita from Sagalla Hills and has a background in accounting. Previous to his role as Greenhouse Manager, Mwach Mwachofi worked at a tourist lodge close to Voi, where he was in charge of bookkeeping and accountancy. He has always had a passion for trees 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.

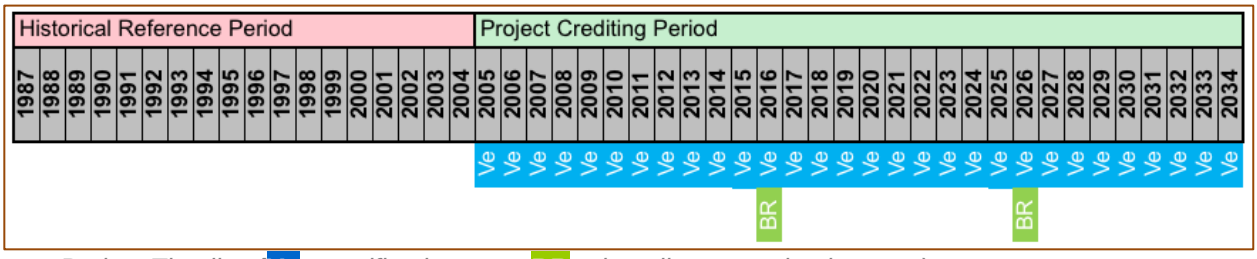
1.5 Project Start Date (G3)

The Project Start Date is January 1st, 2005. This monitoring period (m_4) is the fourth monitoring period and started on January 1st, 2013 and ended on December 31st, 2014.

1.6 Project Crediting Period (G3.4)

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

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



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

Figure 3: The Project Crediting Period, verification schedule and baseline reevaluation years.

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

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 has implemented new and innovative activities that have been 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

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)

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

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

Wildlife Works business activities

- *EcoFactory expansion and print factory*
- Local Production Clothing Factory
- *Wildlife Works Soap Factory*
- *Wildlife Works Greenhouses and selling point*
- *Tree nursery and Amiran Greenhouses*
- *Jojoba propagation*
- ~~*Mushroom Farms from Elephant Dung*~~
- *Reforestation of Mt. Kasigau and surrounding area*
- *Wildlife Works Eco-Charcoal Production Facility*
- *Ecotourism Projects*
- *Support to establishing the Tsavo Conservancy*
- *Wildlife Works Health 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.

In addition to the Project Activities described in detail in the following section, Wildlife Works also funded the following activities during the monitoring period. These activities were mainly in support of the community based organizations, so as to ensure their growth and proper operation.

- 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.
- Mwachabo Development Forum – Wildlife Works supported the salaries for the CBO Office Manager and Office Secretary salaries, Office rent and office supplies.
- Sagalla Conservation and Development Forum – Wildlife Works supported the salaries for the CBO Office Manager and Office Secretary salaries, Office rent and office supplies.
- Mwatate District Stakeholders Forum – Wildlife Works supported the salaries for the CBO Office Manager and Office Secretary salaries, Office rent and office supplies.
- Kasigau Development Trust – Wildlife Works supported the salaries for the CBO Office Manager and Office Secretary salaries, Office rent and office supplies.
- Marungu Hill Conservancy Association – Wildlife Works supported the salaries for the CBO Office Manager and Office Secretary salaries, and office supplies. The CBO is paying for the Office rent.

Below is a description of each Project Activity that has 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.

Up until Jan 2013 there were 5 locations that the LCCs and CBOs work from to ensure fair distribution of funds and specialized application of funds based on local needs. In January 2013, Mackinnon Road was taken up as a new location, making it a total of 6.

August 2013 marked the end of term for the former Locational Carbon Committees (LCCs). Having been in service for two years, a new set of representatives were elected in the five locations that have been part of our REDD+ project since the beginning (the sixth location only joined in early 2013 and therefore did not yet require a re-election). The elections were conducted in an open, fair and transparent manner over a series of 35 community *barazas* (meetings) and were overseen by the administrative chiefs, county representatives of the respective locations, as well as officials from Wildlife Works. Seven new members were elected for each LCC.

During the months of September and October 2013, Wildlife Works carried out a number of orientation workshops in each of the locations. The training provided the new LCC members with direct insight into the running of the LCC and ensured that they understand their responsibilities fully.

This year, a further three-day workshop was held in April. With a focus on the Social and Biodiversity Monitoring component of the REDD+ project, this workshop brought together all of

the six LCCs. Under the guidance of Wildlife Works' Director for Biodiversity and Social Monitoring, Dr. Mwangi Githiru, the 2013 monitoring results were discussed amongst the attendants and the importance of monitoring in future years highlighted. This forum strengthened community engagement as well as provided a platform for sharing lessons learnt.

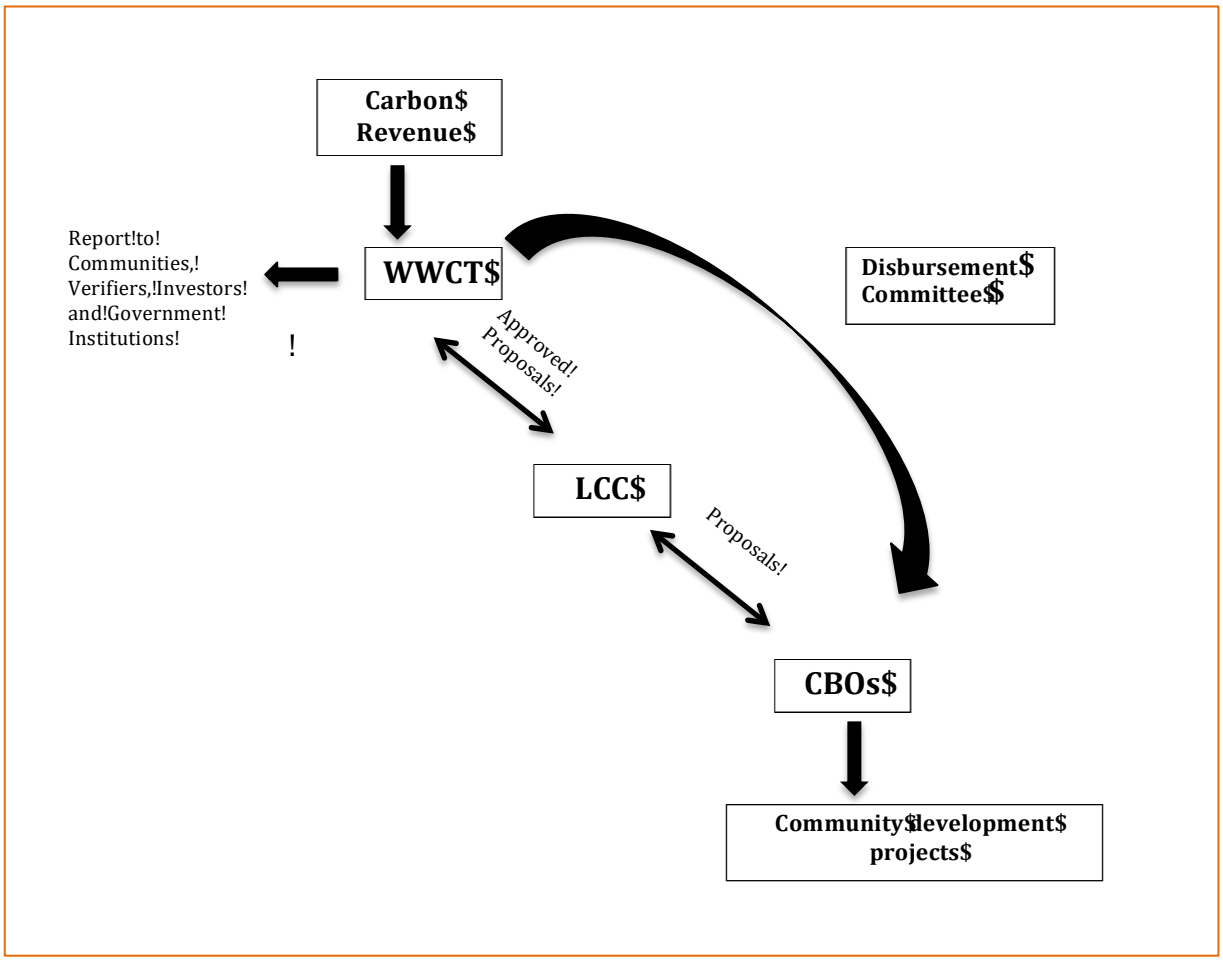


Figure 4: The method that Wildlife Works disburses revenue from project carbon credit sales to the communities.

The community component of the carbon revenues is administered via the WWCT. The Trust releases money for various community projects selected by the Locational Carbon Committees (LCCs). Aside from educational bursaries (next section), a total of 42 projects have been commissioned by the LCCs between 2011 and 2014, a majority of them in 2012 and 2014 (Table 1). Half of the 42 projects have been completed, 6 are ongoing and 15 are on hold largely due to the lack of finances. Most of the projects have been towards schools (50%) and water infrastructure (38%) (Figure 5). School projects have predominantly involved construction and repair of classrooms as well as furniture provision, whereas water projects entail improvements to collection and harvesting, including pipeline construction. Overall, these projects have so far cost a total of KES 21,703,492 (USD 249,465) (Figure 6).

Table 1: Number of community projects commissioned by LCCs across the six Kasigau Corridor REDD+ Project locations

Location	2011	2012	2013	2014	Grand Total
Kasigau		7		2	9
Mackinnon				2	2
Marungu	1	2	1	4	8
Mwachabo		4		1	5
Mwatate		4		5	9
Sagalla		9			9
Grand Total	**1**	**26**	**1**	**14**	**42**

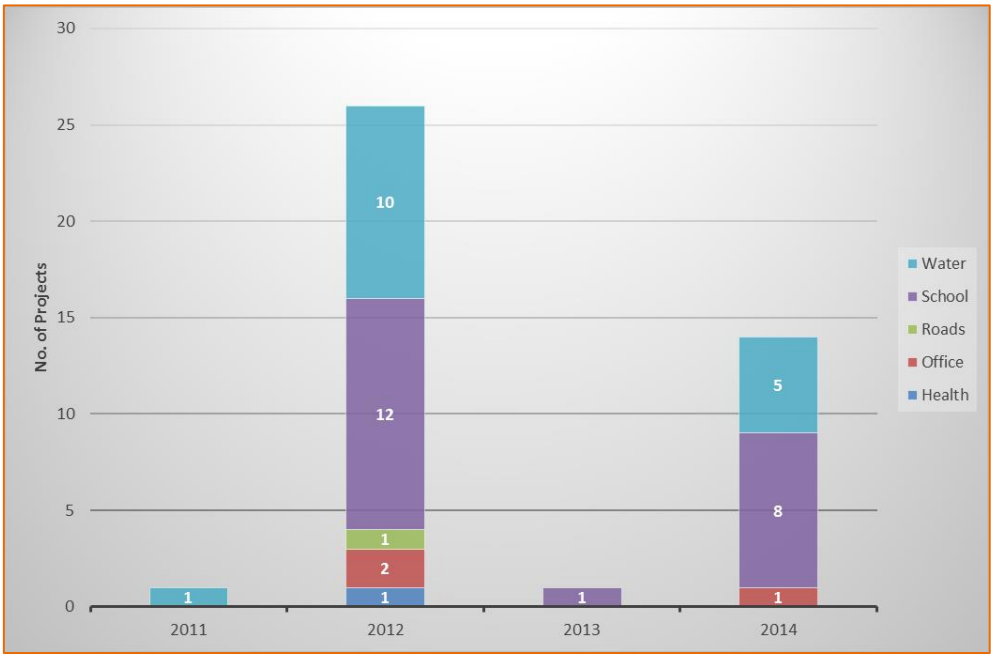


Figure 5: Main project types selected by LCCs in the six locations within the Kasigau Corridor REDD+ Project zone from 2011-2014

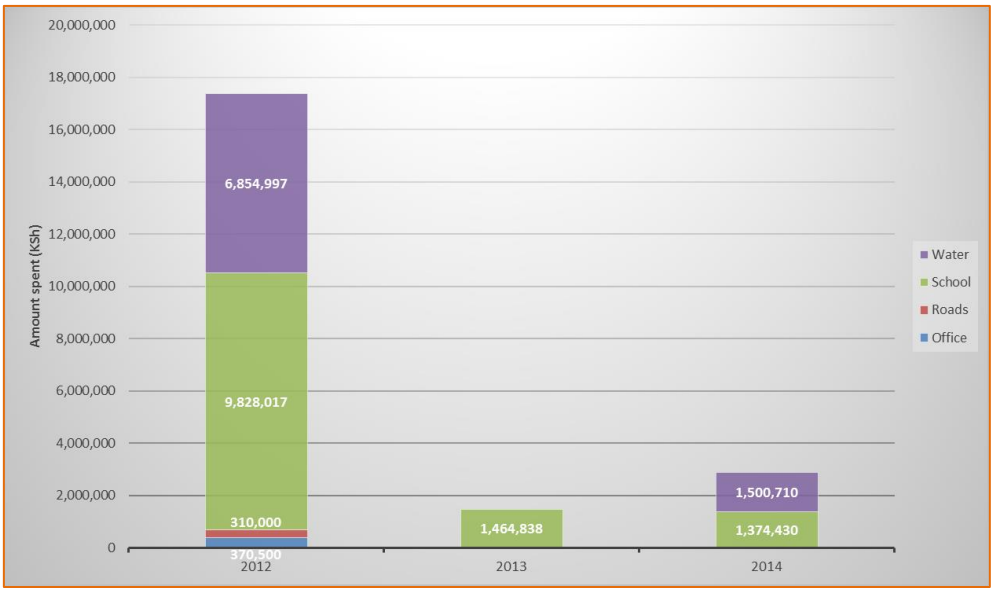


Figure 6: Total costs incurred so far for undertaking the various projects selected by LCCs in the six project locations from 2012-2014

2.2.2 School Construction and Bursary Scheme

The WWCT through LCCs also administers school bursary program for students within the REDD+ Project Zone. Between 2012 and 2014, 3,044 students have received sponsorship through this scheme at a total cost of KES 18,171,968 (USD 208,873) (Figure 7a). Although there were more government-sponsored (CDF) students during this same period (7,142 students), the amount spent by the government compares to WWCT's outlay (KES 21,711,680; USD 249,560). In 2014, a total of 596 students received bursaries from the WWCT totaling KES 2,886,428; amount spent by location showed some variation (Figure 7b).

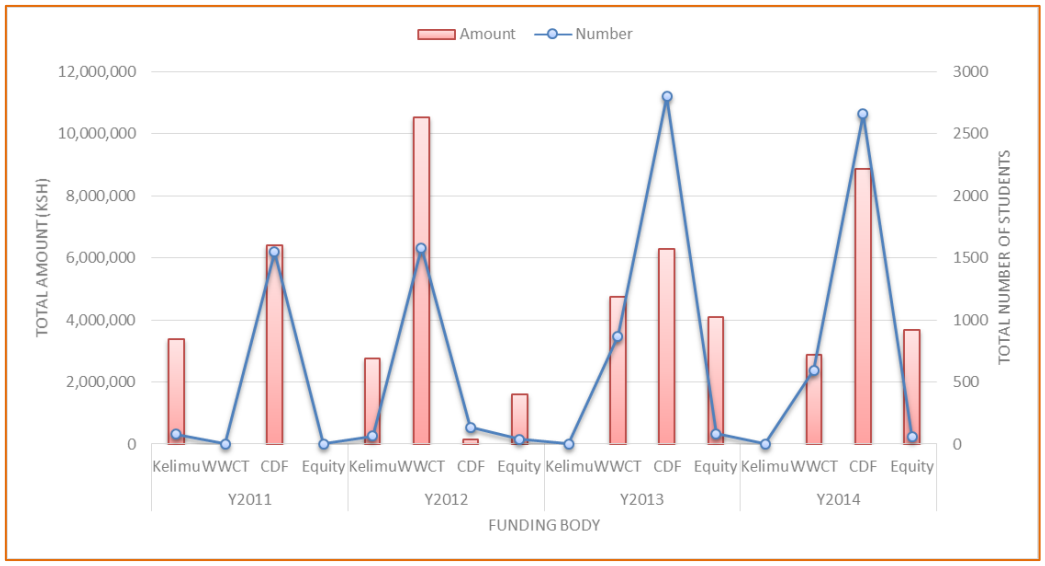


Figure 7a: Total number of students and amount spent on bursaries by key providers in the Kasigau Corridor REDD+ Phase I and II Project Zone from 2011-2014



Figure 7b: Total number of students and amount spent on bursaries by WWCT in the six locations within the Kasigau Corridor REDD+ Project zone in 2014

2.2.3 Waterholes, Ranger outposts and Surveillance

The operations team at Wildlife Works has been providing key support functions to help achieve the goals of the REDD project. Major activities so far have been improving the water availability for wildlife and livestock so as to reduce conflicts, as well as improving ranger coverage and surveillance. Between 2011 and 2014, 13 watering points have been scooped, 10 within the

REDD+ project area and three in the reference and community areas at a total cost of KES 5,959,200 (USD 70,108) (Table 2). During the same period, there has been a total of 16 improvement or construction activities at the 7 ranger outposts across the REDD+ Project Area at a total cost of KES 7,968,000 (USD 93,741) (Table 4). Lastly, the operations team has seen an increase in costs towards aerial surveillance to help ameliorate the growing elephant commercial poaching project as an early-warning and deterrent system. Whilst in 2012 this comprised only 26.7 flying-hours at a cost of USD 1,736, this increased to 54.8 hrs and USD 3,562, and 38.5hrs and USD 2,646 in 2013 and 2014, respectively (note that the 2014 figures are incomplete).

Table 2: Waterholes scooped using revenues from the Kasigau Corridor REDD+ Project between 2011 and 2014

Date	Area	Main use	Waterhole name	Diameter	Cost-KES	Cost-USD
08-Aug-11	Rukinga Ranch	WL	Salama	80	687,600	8,089
09-Dec-11	Rukinga Ranch	WL	TDC Airstrip	20	183,360	2,157
10-Oct-11	Rukinga Ranch	WL	Chui	30	275,040	3,236
02-Feb-12	Rukinga Ranch	WL	Mbugani Juu	35	320,880	3,775
06-Oct-12	Rukinga Ranch	WL	Lokidori	35	343,800	4,045
07-Sep-12	Rukinga Ranch	WL	Fisi	35	343,800	4,045
10-Dec-12	Rukinga Ranch	WL	Mwakaramba	40	275,040	3,236
26-Jun-13	Maungu Ranch	WL/LV	Maungu1	50	435,480	5,123
09-Aug-13	Jojoba Farm	WL	Jojoba	70	802,200	9,438
11-Dec-13	Rukinga Ranch	WL	Chui	50	229,200	2,696
29-Aug-14	Community	LV/HU	Mkamenyi	70	756,360	8,898
10-Feb-14	Community	LV/HU	Kisimenyi	75	618,840	7,280
11-Jun-14	Maungu Ranch	WL/LV	Maungu2	80	687,600	8,089

Table 3: Ranger outpost construction or improvements using revenues from the Kasigau Corridor REDD+ Project between 2011 and 2014

Date	Ranch	Outpost	Work carried out	Capacity (rangers)	Cost-KES	Cost-USD
Apr-10	Mgeno	HQ	Rehabilitation	10	950,000	11,176

Jul-10	Taita	HQ	Rehabilitation	12	800,000	9,412
Sep-10	Kasigau	HQ	Rehabilitation	12	350,000	4,118
May-11	Rukinga	ST6-0	Full construction	18	2,460,000	28,941
Aug-11	Rukinga	ST5-5	Rehabilitation	8	125,000	1,471
Mar-12	Mgeno	HQ	Solar Power Increase	10	55,000	647
Mar-12	Taita	Taita	Solar Power Increase	12	55,000	647
Mar-12	Kasigau	Kasigau	Solar power installation	12	78,000	918
Mar-12	Rukinga	ST6-0	Solar power repair	18	15,000	176
Apr-14	Rukinga	ST6-0	Solar invertor replacement	18	56,800	668
Apr-14	Mgeno	HQ	Solar invertor replacement	10	62,800	739
Apr-14	Taita	HQ	Solar invertor replacement	12	56,800	668
Apr-14	Kasigau	Kasigau	Solar invertor replacement	12	56,800	668
Apr-14	Rukinga	ST5-5	Solar invertor replacement	8	46,800	551

2.2.4 Community liaison

The key activity of the Community Liaison and Outreach team is to help sensitize the entire project community both about environmental conservation and climate change in general, but also about the REDD+ project in particular and its progress. In doing this, the team reaches out to schools, general community and Wildlife Works' employees using a variety of techniques and teaching modes to deliver these varied messages.

2.2.4.1 Schools

One key area of outreach is schools. Between 2011 and 2014, 63 events have been targeted to local schools at all levels, about 67% in primary school, 22% in secondary and the rest in tertiary

institutions. This has also been spread across the different project locations, albeit with different intensities (Fig. 2). The major content of these events has been climate change and REDD projects (84%), while most of the rest (12%) has been on how schools can participate in REDD projects. A cumulative total of 4,199 students have been reached excluding 2011 where numbers were not recorded: 745 students in 2012, 2314 in 2013 and 1140 so far in 2014. Most modes of presentation have been PowerPoint slides followed by discussion sessions (89%), but there have also been a few shows (films and plays).

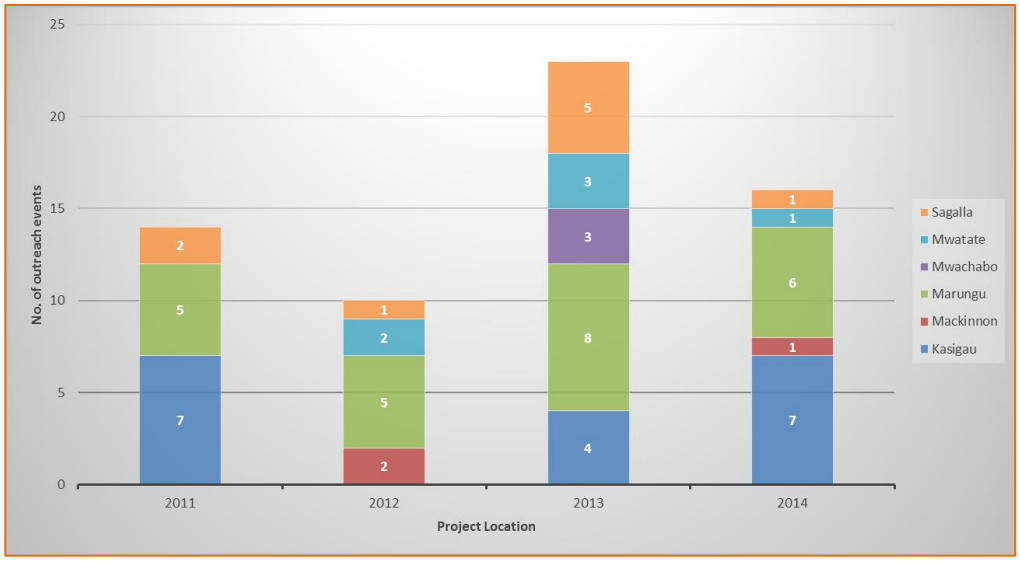


Figure 8: Number of outreach events targeted to local schools in the six project locations within the Kasigau Corridor REDD+ Project Area from 2011-2014

2.2.4.2 *Community*

In addition to schools, the general community is another major outreach target. Between 2012 and 2014, 356 meetings have been held across the project area involving the wider community members: 110 meetings in 2012, 129 in 2013 and 117 in 2014 so far. A total cumulative number of participants of 23,810 has been reached: 8,888, 8,140 and 6,782 in 2012, 2013 and 2014, respectively (Figure 9). Most of these involved meeting or workshop-type deliberations; speeches, talks, plays and films were also used (Figure 10). The major content of almost half of all the events was REDD+ benefit sharing and community engagement (48%), with most of the rest involving running community projects (29%) and school bursary program (15%) (Figure 11).

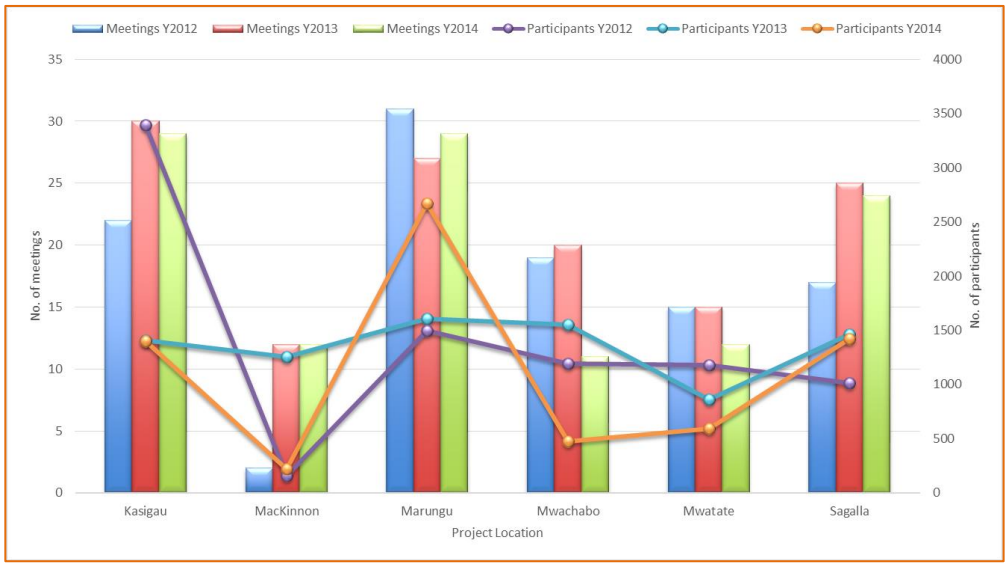


Figure 9: Number of community meetings (and participants) held across the Kasigau Corridor REDD+ Phase I and II Project Zone between 2012 and 2014 in the six project locations.



Figure 10: Modes of engagement during the community meetings held across the Kasigau Corridor REDD+ Phase I and II Project Zone.

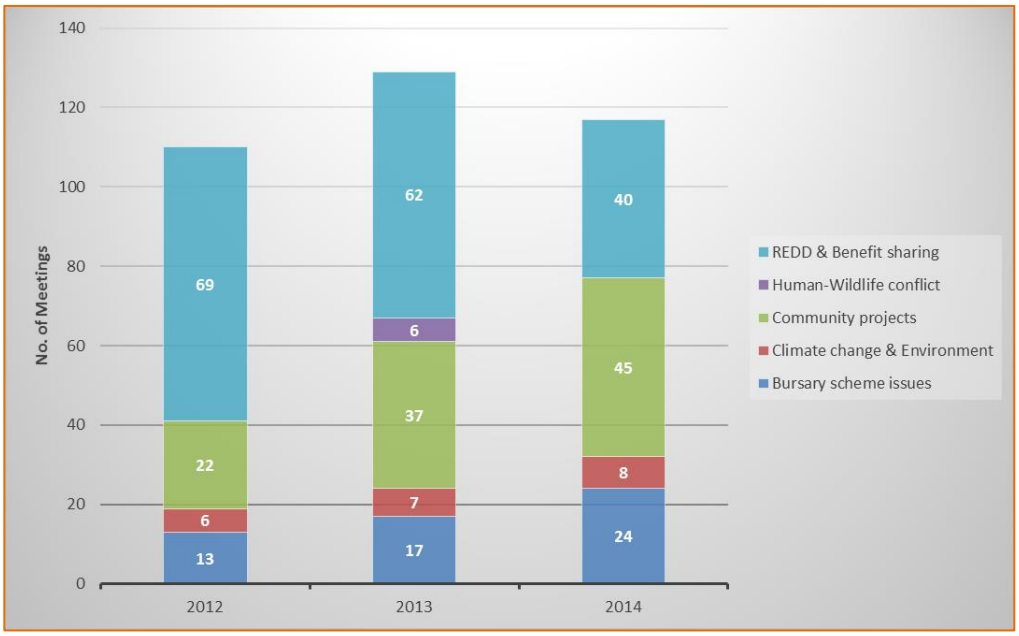


Figure 11: Major content delivered during the community meetings held across the Kasigau Corridor REDD+ Phase I and II Project Zone from 2012-2014

2.3 Wildlife Works

Finally, community outreach entailed engaging Wildlife Works' employees most of whom are members of the local community. A total of 33 meetings have been held between 2012 and 2014, a majority being on strengthening and operations of the Carbon Trust (46%); most departments have been reached including field sampling teams, eco-factory staff, greenhouse and housekeeping staff and security staff. These meetings have either been on implementation of community projects or general climate change, carbon and REDD+ related issues (Figure 12).

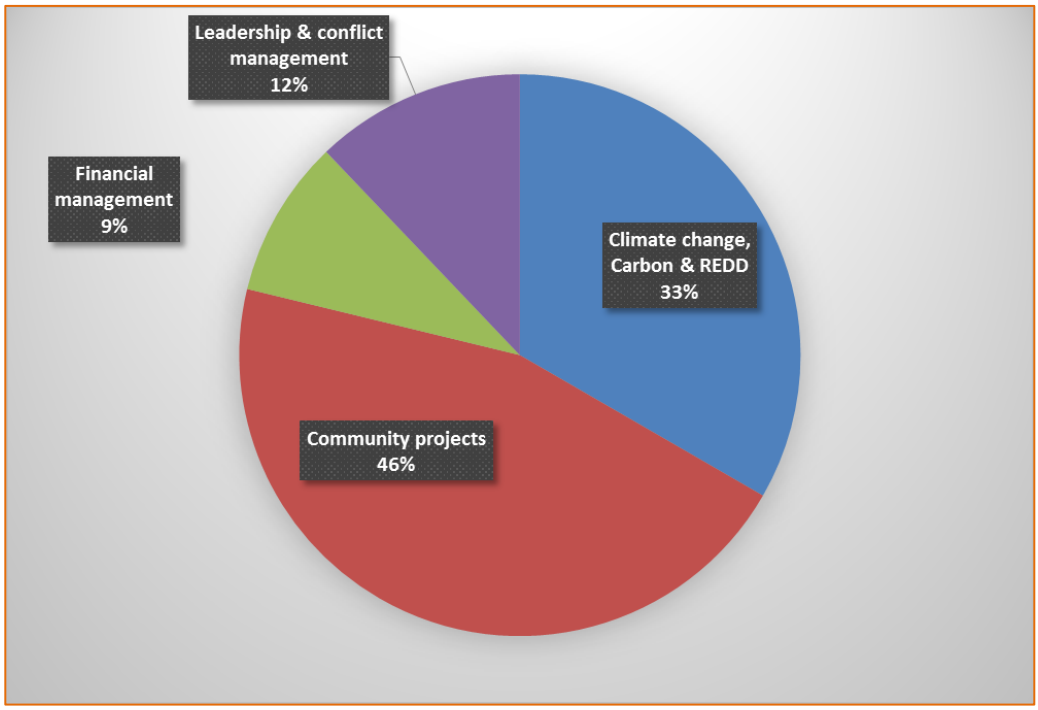


Figure 12: Major content delivered during the Wildlife Works' staff meetings held at the company HQs between 2012 and 2014

2.3.1 Support to the Community Based Organizations

We are currently partnering with six Community Based Organizations (CBOs) in the Project area. The Main Roles of the CBOs s are-

- to receive concept notes from the community members in their respective project area and submit said proposals to the LCC for consideration
- to act as a link between WWCT and the community where the projects are implemented
- to writes reports of the projects done in the communities as per the contractual agreement with WWCT.
- to provide public access to the minutes from meetings pertaining to WWCT as well as accounts funded by WWCT
- to transfer the benefits derived from conservation as extensively and as fairly as possible within the location
- to fulfill the obligations outlined in their constitution and remain transparent.

Below is a description of the six CBOs that Wildlife Works is working with.

1. **Marungu Hill Conservancy Association (MHCA)**
MHCA is a community-based organization partnering with Wildlife Works in Implementing different projects in Marungu Location. The CBO has a Project Manager and Accounts Clerk who are working in making sure that the Projects In Marungu Location are done to the standards required and in a more transparent and accountable way. The CBO has grown and currently implemented other projects. The CBO has helped the community in implementing projects like the Bursary Scheme, Sasenyi Rock Catchment, Wangalla Classroom renovation and desks project, Marungu Dispensary roof catchment project and the Marasi Primary School Renovation.

They have been supervising the projects and also reporting back to the community on how the money was spent. The CBO has applied for many other projects from other potential donors and soon they will be partnering with the county government in implementing a project called (Njaa Marufuku) that touches on issues concerning Agriculture Intensification.

2. **Kasigau Development Trust (KDT)**
KDT is a Community based Organization that is partnering with Wildlife Works in Kasigau Location. The CBO was formed in the year 2011 and has a Project manager and an Accounts Clerk. The CBO has implemented different projects funded by the carbon money. They have implemented projects like the Jora water tank, Makwasinyi water project, Moi High Furniture and the Bursary scheme. The CBO is currently applying for different projects and they have been instrumental in making sure the projects in Kasigau are done in a more transparent and accountable way.

3. **Mwatate District Stakeholders Forum (MDSF)**
MDSF is a community-based organization working with Wildlife Works in Mwatate location. It has a Project Manager and a secretary who is working in making sure that the projects are done to the standards requires. They have implemented different projects like the Bursary Scheme, Classroom Constructions and Renovations at Mwatate Sec Sch, Mzwanenyi and a roof water catchment project in Maili-Kumi Pri Sch. The CBO has applied for different organizations and they are currently partnering with Total Kenya in selling of sustainable solar lamps in Mwatate.

4. **Mwachabo Development Forum (MDF)**
MDF is a CBO that was formed in Mwachabo Location in 2011 and is currently partnering with Wildlife Works in implementing community projects. The have a Project manager and a Secretary who work in the office to make sure that project are done up to standards. They have implemented projects like the Ngangu Water Project, Bursary Scheme, Construction of classrooms in Mwemba Primary School and Mngama. The CBO has grown its capacity since it started partnering with Wildlife Works. They have applied for other projects from other potential donor.

5. **Sagalla Conservation and Development Forum (SCARDF)**
SCARDF is a CBO that is operating in Sagalla location and is partnering with Wildlife Works in implementing different community projects in the location. The CBO has a Project Manager and a Secretary who are working to make sure that the benefits from the carbon project are transferred to the community in a better and transparent way. Over the last monitoring period, they have constructed four classrooms in the lower Sagalla area and renovated of Kanyanga-Kizumanzi road. They are currently applying for other projects from other potential donor in the region.

6. **Mackinnon Road CBO**
Mackinnon Road CBO is a new CBO that was established in the year 2013. They are in the process of employing a Project Manager and a Secretary. They helped in the implementation of the bursary project in Mackinnon location.

CBO training

August 2013 marked the end of term for the former Locational Carbon Committees (LCCs). Having been in service for two years, a new set of representatives were elected in the five locations that have been part of our REDD+ project since the beginning (the sixth location only

joined in early 2013 and therefore did not yet require a re-election). The elections were conducted in an open, fair and transparent manner over a series of 35 community barazas (meetings) and were overseen by the administrative chiefs, county representatives of the respective locations, as well as officials from Wildlife Works. Seven new members were elected for each LCC.

During the months of September and October 2013, Wildlife Works carried out a number of orientation workshops in each of the locations. The training provided the new LCC members with direct insight into the running of the LCC and ensured that they understand their responsibilities fully.

In 2014, a further three-day workshop was held in April. With a focus on the Social and Biodiversity Monitoring component of the REDD+ project, this workshop brought together all of the six LCCs. Under the guidance of Wildlife Works' Director for Biodiversity and Social Monitoring, Dr. Mwangi Githiru, the 2013 monitoring results were discussed amongst the attendants and the importance of monitoring in future years highlighted. This forum strengthened community engagement as well as provided a platform for sharing lessons learnt.

2.3.2 EcoFactory

Our core Consumer Powered Conservation[sm] project was the construction of the EcoFactory, just outside the North Eastern 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 the Project Area. 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 increased steadily over the years as well as their geographical scope. In 2013 and 2014 we have continued producing for Wildlife Works' own collection, as well as Threads for Thought, SOKO, Eden, Heaven Restaurant Rwanda, Kisany Living Linen and Kilambi, amongst others, representing clients from the USA, Canada, Belgium and Rwanda.

In terms of constructional improvements, in 2013 Wildlife Works purchased one *Rotondi* steam boiler Model # 160 524, that is able to power up to four irons. This has greatly increased the output and quality of pressing garments and thereby improved our production line. Additionally, in 2014 we have begun renting out half of one factory floor to SOKO.

Finally, in September 2012, we had passed all required tests to become FairTrade certified. In 2013 we passed our second audit with FloCERT, Thereafter, upon clients' demand, a decision was made to change FairTrade certifiers and in 2014 we began making the shift from FairTrade International to FairTrade USA. An extensive audit was carried out in October 2014 after which we are making small corrective measures, such as lowering firing extinguishers, to complete the process. We hope to receive the final confirmation by early 2015.

2.3.3 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.

2.3.4 Eco-Charcoal Production Facility

Over the last monitoring period, Wildlife Works Eco-Charcoal project has been scaled-up significantly. In particular, this entails having moved operations to a new 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".

An agreement was reached between Wildlife Works and Taita Ranch for leasing an area of 500 hectares close to Mackinnon road, which is utilized for obtaining the biomass as well as processing it. 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 required that the project pass through a lengthy regulatory process. Under the 2009 Charcoal Regulations, commercial charcoal production must be governed by a licensing agreement with the Kenya Forest Service (KFS). Furthermore, it was necessary to obtain the approval of the National Environmental Management Authority (NEMA) through producing an Environmental Impact Assessment. A comprehensive EIA was completed in 2012, and the certificate issued by NEMA in February 2013.

Throughout the course of early 2013, the site was developed and all necessary facilities constructed. It now entails a drying office, a separation room, a store and a packing facility, as well as a general office. A new Eco Charcoal Project manager was employed in April 2013, who is currently running a team of eight employees. On average the project produces 2300 briquettes per week, which are sold at KSH 10 per piece. Clients include local hotels, safari operators, restaurants and individuals. It is planned to purchase an automatic briquette machine, which will increase output volume dramatically. Up to December 2014, Wildlife Works has spent a total amount of Ksh 3,708,746 ($ 43,632) on the eco-charcoal project.

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.

2.3.5 Ecotourism Projects

Up until the last monitoring period, Camp Kenya, which is run by Camps International, had a lease for the eco-tourism site TDC on Rukinga ranch. This camp primary served students from the United Kingdom on a gap year program. Due to increased perceived threat of terrorism and various travel warnings for some areas in Kenya issued in 2014, tourist numbers declined sharply. This also had a great impact on gap year student numbers and as a consequence Camp Kenya did not renew their lease in October 2014. Thus, there are currently no external eco-tourism operators in the Project Area.

Rukinga Ranching Company Ltd. is currently renovating the camp with the aim of marketing it to the local market. The Kasigau corridor is conveniently located to become an attractive through-road for travelers driving from Nairobi to the popular tourist resort of Diani, or vice versa. This route would avoid the busy and lengthy trip via Mombasa, whilst offering the travelers the possibility to break the journey as well as go on safari. The camp under new management is expecting to have its first guests in December 2014.

Wildlife Works is supporting this through offering labor hours and technical advise. Making the camp functional again is also in the interest of Wildlife Works, as it supports the establishment of the Tsavo Conservancy, which a new project activity. Please see the next section for more details.

2.3.6. Tsavo Conservancy (RAKATA)

The Tsavo Conservancy (referred to as RAKATA) is a partnership between seven landowner groups (ranches) that came together in mid 2013 to establish a community-led wildlife conservancy. These ranches are Rukinga, Taita, Kambanga, Wangala, Dawida, Bachuma and Amaka, which collectively span across ~250,000 acres. Initial discussions began in June 2013 and to date there have been a total of six meetings with landowners during which a legal advisor, Elizabeth Gitaru from the Kenya Land Conservation Trust (KLCT), offered her expert advise. During these meetings, the basic structure and goals of Tsavo Conservancy were discussed and draft documents of the **Memorandum and Articles of Association of Rakata Company Ltd.** and **Trust Deed for the Tsavo Conservation Trust** have been drawn up. These are currently with the lawyers of the respective ranches and await comments and approval before proceeding to the final stage of formation.

The main goals of the Tsavo Conservancy are:

- Create alternative income sources
- Develop tourism and conservation infrastructure
- Increase access to tourism market
- Increase land and title security
- Heighten security
- Reduce Human-Wildlife Conflict
- Enhance social cohesion amongst the ranches
- Create job opportunities

Wildlife Works has actively supported this process by offering expert advice and ideas. Furthermore, Wildlife Works' financial contribution has been significant. Over the past year, Wildlife Works has spent Wildlife Works has spent Ksh 15,230 (US $177) in 2013 and Ksh 344,490 (US $4,005) on travel and accommodation for Elizabeth Gitari from KLCT, meeting expenses and follow up. Wildlife Works envisions that the Tsavo Conservancy be formed by early 2015 and that tourist visit shall take of in the new year.

2.3.6 Wildlife Works Soap Factory

Construction of the soap factory building was completed in April 2013 and operations moved into the building shortly afterwards located close to the Carbon Office. Wildlife Works was employing two local ladies, who were joined by a third lady in 2014. Soap production has since increased and we are now making a large variety of different flavors, including coffee and jojoba, coconut and lime, Moringa and olive oil, myrrh and jojoba, honey and beeswax and beer soap. Per month, average production is approximately 10-15 batches, where 1 batch equals 1kg of soap. This mirrors the current yet we have the capacity to increase production significantly. Soaps are being sold to various shops in the country as well as to local staff.

2.3.7 LOCAL FACTORY

In April 2013, Wildlife Works opened its local sowing factory close to the Carbon Office. This entailed equipping the existing building that formally hosted the soap making facility with sowing machines. Five employees are currently in the local production, and mainly produce T-shirts for domestic clients, who are often printed using manual screen-printing methods. Demand for these organic garments has risen enormously, and clients include Lancet Laboratories, Savage Wilderness, Ol Pejeta Conservancy, Mount Kenya Trust, 4 Shore, Rift Valley Academy, and the 10-to-5 Bicycle race, just to mention a few. In addition, Wildlife Works produces its own T-short collections, which are sold throughout shops in Kenya.

2.3.8 Amiran Greenhouses, Tree Nursery and Jojoba propagation

Our greenhouse team has been extremely busy this year and has made fantastic progress in their department. Under the leadership of George Thumbi, who joined Wildlife Works as the Agribusiness and Forestry Manager in February 2014, a number of exciting new projects have been introduced and existing ones improved. The overall objectives of the greenhouse facilities are to provide alternative livelihood options to the community and improve food security in an environmentally friendly way. The Greenhouse department now operates six different projects, with another one in the pipeline, each of which focuses on a different aspect of sustainable agriculture.

Major progress has been made in the Jojoba project! Jojoba was initially introduced for its characteristics of being a highly drought resistant, perennial crop. It is also not predated on by any animals, and therefore reduces human-wildlife conflict. Moreover, it is a desirable cash crop, as it produces high value oil that is used to manufacture beauty products. As an expansion in this department, the greenhouse purchased a new oil seed press at a cost and is now planning to develop a new sub-department of oil production. This is an exciting development, as jojoba oil has a high market value and thus presents a potentially new source of income to the communities. In addition, it is possible to press many other types of seeds, such as moringa, sunflower, baobab etc. as well as fruits, such as avocado.

Additional progress has been made in the organic Amiran greenhouses. The available space is utilized more effectively and new techniques are being tested, such as drip irrigation, to improve vegetable production as well as to increase productivity per land unit.

The fruit tree nursery further adds to improving food security. The greenhouse team offers high quality grafted fruit tree seedlings to farmers for planting on their farms. Fruit trees require much less water than most common crops, whilst also being much more productive! Mango, passion and orange trees are just a few examples of the seedlings that are available for purchase at the seedling selling point for Ksh 150 per unit.

The greenhouse team gets particularly busy before the onset of rains, due to Wildlife Works' extensive reforestation program. In partnership with the surrounding communities, indigenous tree seedlings are bought from local farmers, raised in the greenhouse under supervision of our horticulturists and then distributed back to the communities free of charge just before the rainy season starts. The aim of this program is to reforest the surrounding area, whilst also providing a future source of firewood and building material to the communities.

Finally, a new rabbit unit has been introduced. The aim of this is to harvest rabbit urine for use in the organic farming, for it is rich in minerals, especially nitrogen. A worm farm for "worm juice"

(vermin-liquid) has also been started, and a chicken project is planned in the future. Overall, the improvements in the Greenhouse department have been great and we look forward to seeing these projects grow and prosper even more!

2.3.9 Wildlife Works Health Projects

During the last monitoring period, Wildlife Works has invested significant time and money into improving health and awareness in the surrounding communities.

i. Feminine Hygiene

One of Wildlife Works' focuses was to increase awareness of girls' rights and female hygiene. Sadly, as in many other parts of the world, girls and women rights are still contested amongst the local communities. Furthermore, feminine hygiene is something of a taboo topic in this area, yet it does present some real problems to many girls and women. In order to raise awareness and help girls in their personal lives, Monica Makori and Emily Mwawasi, our resident Women's Outreach team, have conducted a series of educational workshops. Since 2013, they have held 16 workshops at 8 schools throughout the project area, each of which reaches average of 50-60 girls. At the most recent one held in November 2014, the total number of girls was 80-90.

The workshops cover an array of topics, such as sexual education, HIV, stigma and body hygiene. In addition, the young girls and women are taught in making reusable, eco-friendly sanitary towels from re-cycled materials, which are affordable and environmentally friendly. Through this initiative, we are helping to empower girls and women to overcome some of the day-to-day difficulties they are faced with. The up-take and response has been very positive and with continued demand for such workshops, Wildlife Works will continue to conduct these outreaches.

ii. Moi District Hospital Laboratory (MDH)

Residents of Taita-Taveta County will now have access to diagnostic laboratory services in their proximity. In July 2013 Wildlife Works signed a Private Public Partnership (PPP) with Moi District Hospital, a Kenyan Government district-level district hospital, and Lancet Kenya, a private pathology laboratory company based in Nairobi. It had been noted that while healthcare services in the Taita-Taveta county facilities were generally available to the residents of the region, the laboratory diagnostic facilities and services available to healthcare delivery personnel had deteriorated to near non-existentence. This had for some time caused great inconvenience as well as difficult morbidity and mortality rates, as reliable services were then only available in Mombasa or Nairobi, often dangerously far away.

Construction of the laboratory began in August and was completed in January 2014. The Ksh 14,190,000 ($165,000 USD) expenditure for full physical renovation and re-equipping with state of the art health instrumentation and diagnostic equipment was provided by Wildlife Works. The 130 square meter, air-conditioned laboratory now features state-of-the-art equipment from Germany, and provides computerized laboratory information system, automated analytical platforms, remote pathology supervision and standardized laboratory reporting. With this in place, it is not only the communities surrounding the Kasigau Corridor REDD+ Project, but all residents of Taita Taveta County.

2.3.10 Project Product Sales and Marketing

Over the last monitoring period, Wildlife Works has significantly expanded its collection of local products, which are made in-house as well as sourced from the local communities. As such, Wildlife Works maintains its support to Women's Group ventures and Disabled groups in the area. It currently works with over 25 women groups, from whom we periodically buy hand-made sisal baskets for sale, as well as the Bughuta Disabled Group produce hand-made soft-toys in the shame of rhinos, elephants, giraffes and other African mammals. In addition to the usual sisal baskets, Wildlife Works has begun to package its eco-soaps using miniature sisal baskets and elephant dung paper. This has helped raise the demand for such baskets and provides greater income security to the women.

Collectively, Wildlife Works' products range from baskets, toys, jewelry and key chains to in-house made soaps and clothing. These are sold to a variety of shops in two tourist resorts (Diani, Kilifi) as well as three major shops in Nairobi. There is also a local shop at the Wildlife Works headquarters in Maungu. Finally, a number of large Christmas craft fairs are held in December of each year at which Wildlife Works sells a significant amount of products. In 2013, we attended three fairs, namely in Nairobi, Diani and Watamu.

Wildlife Works also has plans to build a roadside shop along the busy Mombasa highway. In 2012, Wildlife Works successfully negotiated the purchase of a roadside plot of land. This has yet to be developed, but plans are underway to do so in 2015.

2.3.11 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.

2.3.11.1 Road transects

Twenty five permanent road transects totalling 303.5 km, and ranging from 7-18 km, were established in the Project Zone in 2011 to sample medium-sized to large mammals and big birds: 5 in Phase I (totalling 60.5km), 12 in Phase II (176.9 km) and 8 in the Reference Areas (66.1km) (Fig. 1). Vegetation strata along transects corresponds to the overall vegetation composition (based on land-use land-cover classifications used for estimating carbon emission reductions) (Fig. 2), hence the sample can be considered representative of the entire Project Area. Road transects are currently run quarterly.

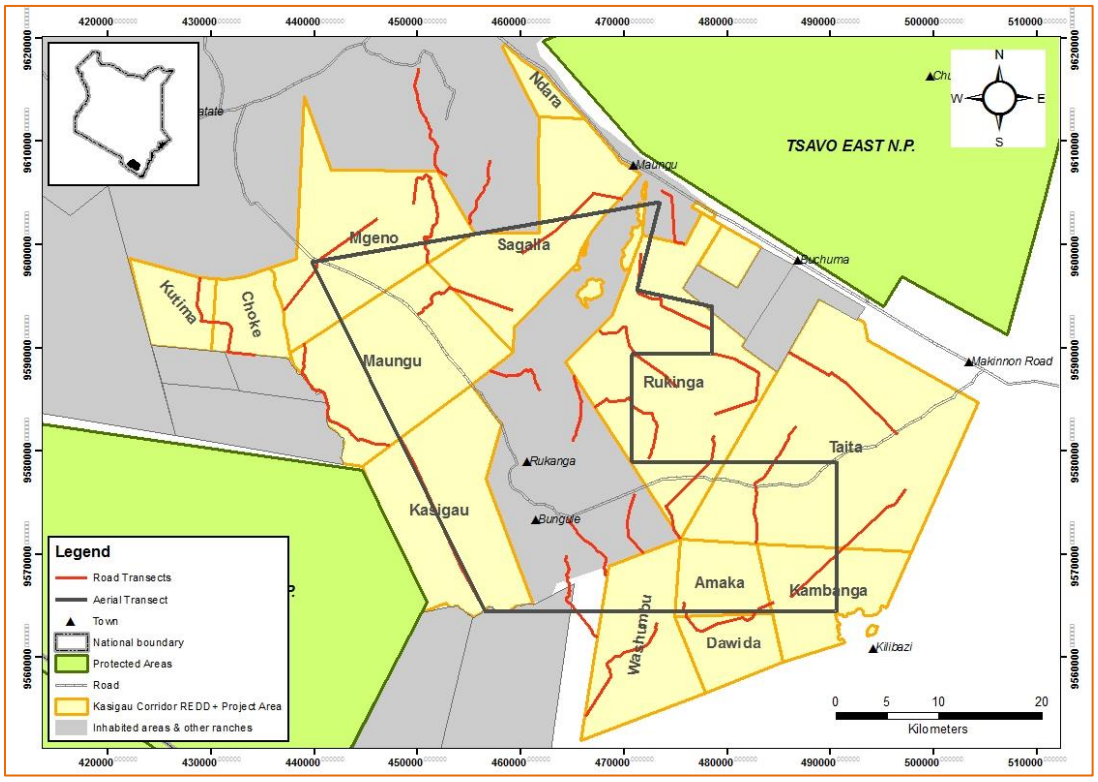


Figure 13: permanent road transects (in red) in the Kasigau Corridor REDD+ Project Zone (Phase I, II and the Reference Area), and the aerial transect (in black)

A total of 10 sampling sessions have been undertaken between October 2011 and December 2013, with at least one session per quarter. A total of 88 different species have been recorded along the transects. Overall, the commonest species encountered were Kirk's Dikdik (1223 encounters out of a total of 3,726 wildlife encounters in total) and the unstriped squirrel (569) (Figure 15). Meanwhile, going by encounter rates, key livestock numbers appear to be fairly constant or declining especially in the Project Area compared to the Reference Area (Figure 16).

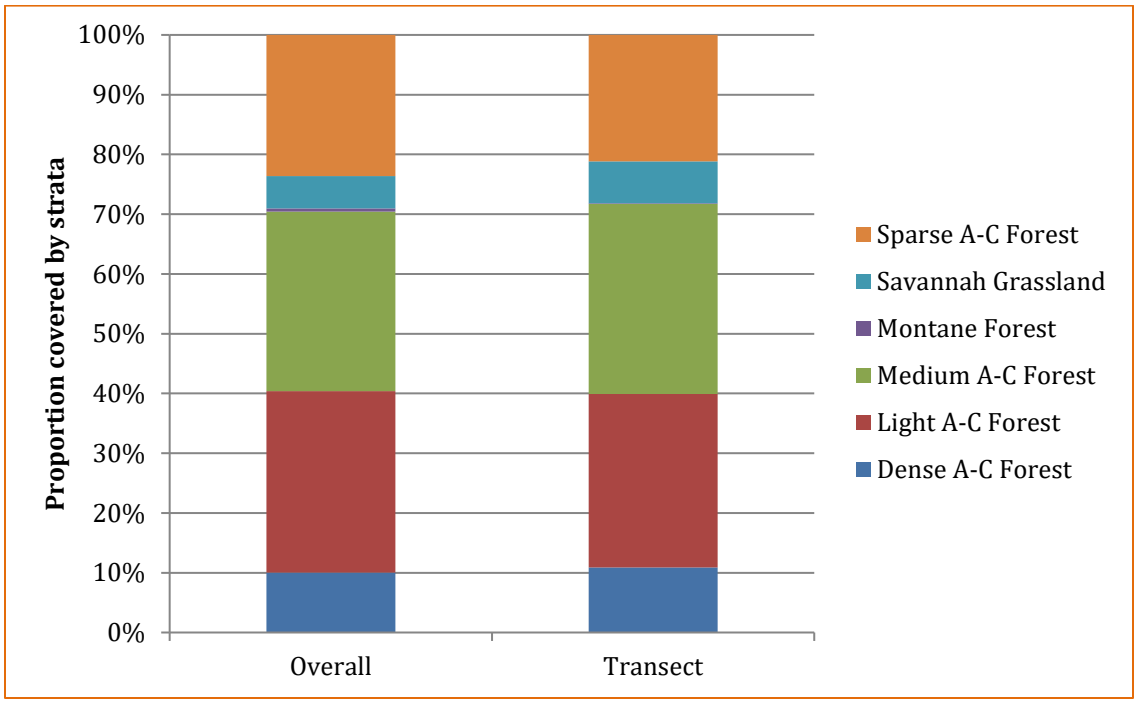


Figure 14: Proportion of six main vegetation strata within the Kasigau Corridor REDD+ Phase I and II Project Area, and within the Road Transects

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 1,700-2,550 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.

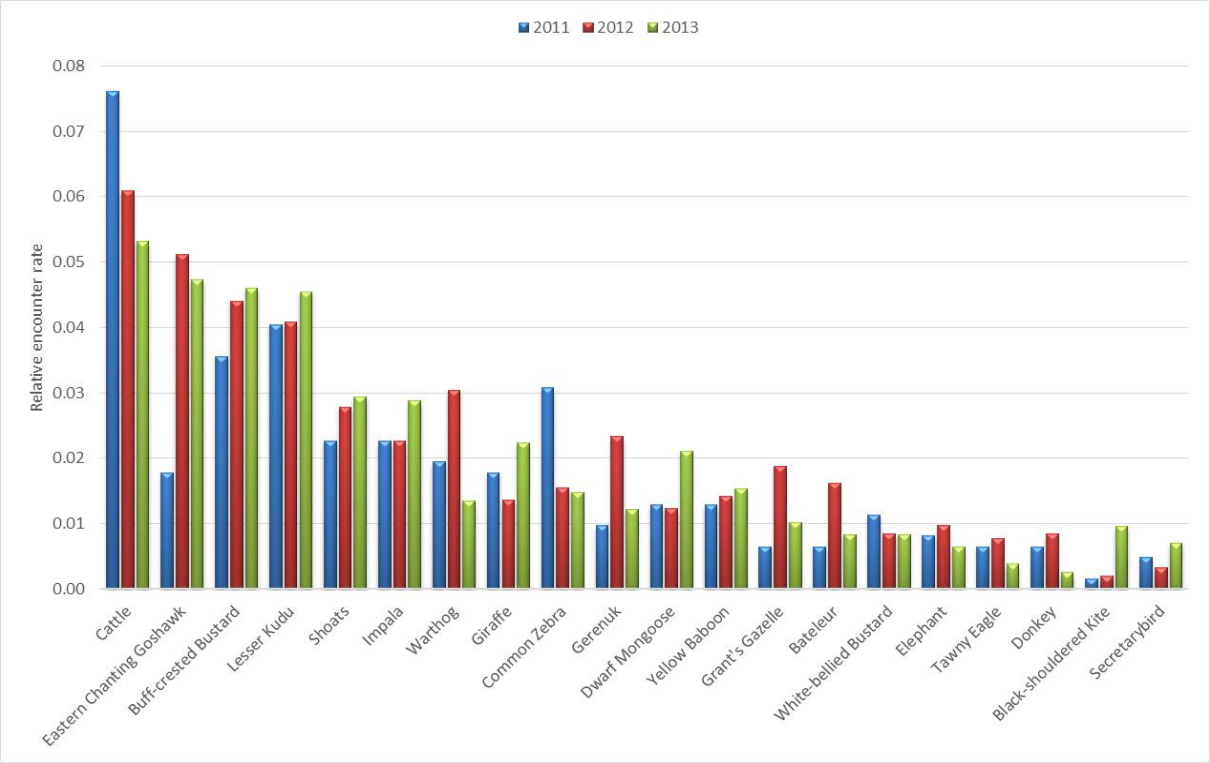


Figure 15: Total number of relative encounters of the 25 commonest species (excluding the Dikdik and Squirrel which made up about 50% of all sightings in all the years) per 10 kilometres of transect for the three project areas (Phase I, II and Reference Area) combined

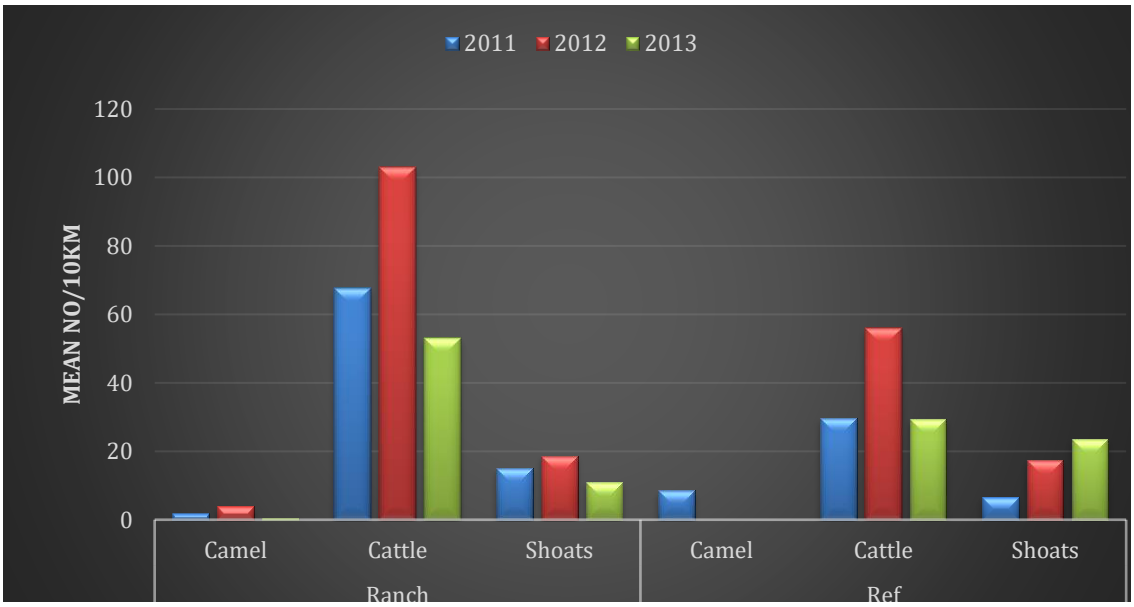


Figure 16: Number of livestock within Project ranches and in the Community (Reference) areas between 2011 and 2013

2.3.11.2 Elephant density estimation

Over the 10 sampling sessions between 2011 and 2013, there were a total of 30 encounters with elephants during transect counts, 15 each in Phase I and Phase II. The overall mean perpendicular sighting distance from the transect line was 43.7m and the mean group size was about 10 individuals. Using this dataset, we ran a pilot detection function modelling exercise in Program DISTANCE to enable robust estimation of elephant numbers. The lowest AIC model amongst a candidate set was one applying the Half-normal key function with 2 Cosine adjustment terms when perpendicular sighting distance was right-truncated at 90 m from transect line (based on a visual examination of the frequency histogram); 8 encounters (27%) were beyond 90 m. This model had an AIC (176.11) and did not deviate from underlying model assumptions (Kolmogorov-Smirnov test D = 0.18, P = 0.46; χ^2_4 = 0.80 without pooling).

The mean group (cluster) size was smaller in the Phase I (7, range: 4-12 individuals) compared to the Phase II ranches (17, range: 7-44), but cluster density was three times greater in Phase I compared to Phase II (Table 4). It is worth cautioning that the precision of these estimates is rather low (high coefficients of variation) and more elephants encounters in are needed to improve precision. Lastly, these data were insufficient to undertake a proper trend analysis (cross-year variation), albeit the number of elephants seem to have slightly increased from 2011 based on mean number of individuals encountered along transects (Figure 17).

Table 4**:** Number of elephants in the Project Area estimated by program DISTANCE based on transect sightings between 2011 and 2013

Project area	Variable	Estimate	%CV	df	95% CI-Lower	95% CI-Upper
Phase I	Density of clusters	0.3	39.9	5.5	0.1	0.9
	Density of individuals	3.7	62.0	13.5	1.1	12.5
	Number of individuals	110	62.0	13.5	32	375
Phase II	Density of clusters	0.1	51.3	13.2	0.0	0.4
	Density of individuals	4.0	77.9	21.6	0.9	16.6
	Number of individuals	674	77.9	21.6	161	2814
Pooled	Density of clusters	0.2	39.1	17.8	0.1	0.4
	Density of individuals	3.9	68.0	22.8	1.1	14.0
	Number of individuals	783	68.0	22.8	219	2804



Figure 17: Mean number of elephants encountered along transects within the Project Area between 2011 and 2013

2.3.11.3 Ranger and Community Scout Monitoring Transects

Patrol effort

Ranger patrol effort as measured by the total distance traversed has been increasing since the project started. In 2011, the seven ranger teams (outposts), combined, travelled 13,304 km on patrol duty (NB: this was only over a 4-5 month period after all teams were issued with GPS units), increasing to 42,200 and 56,140km in 2012 and 2013, respectively. Unsurprisingly, ranger posts not assigned a vehicle (ST 5-3, 5-5 and 8-0) covered lesser ground than the rest (Figure 18 & 19). Lastly, while there were significant differences between total distances travelled by different outposts in different years and quarters (Table 5), there was at least some coverage in most quarters for all years by each outpost (Figure 20).

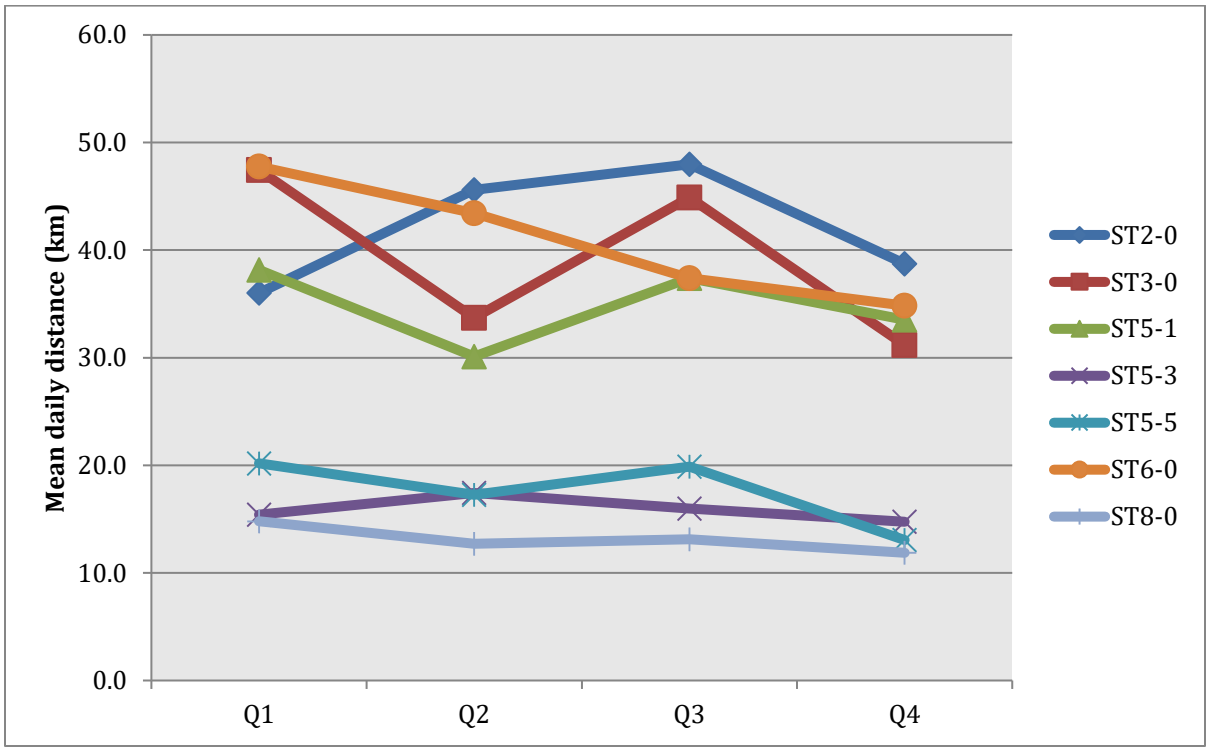


Figure 18: Mean daily distance travelled by each of the seven Wildlife Works Ranger outpost per quarter, averaged for the 2011-2013 data in (b) below

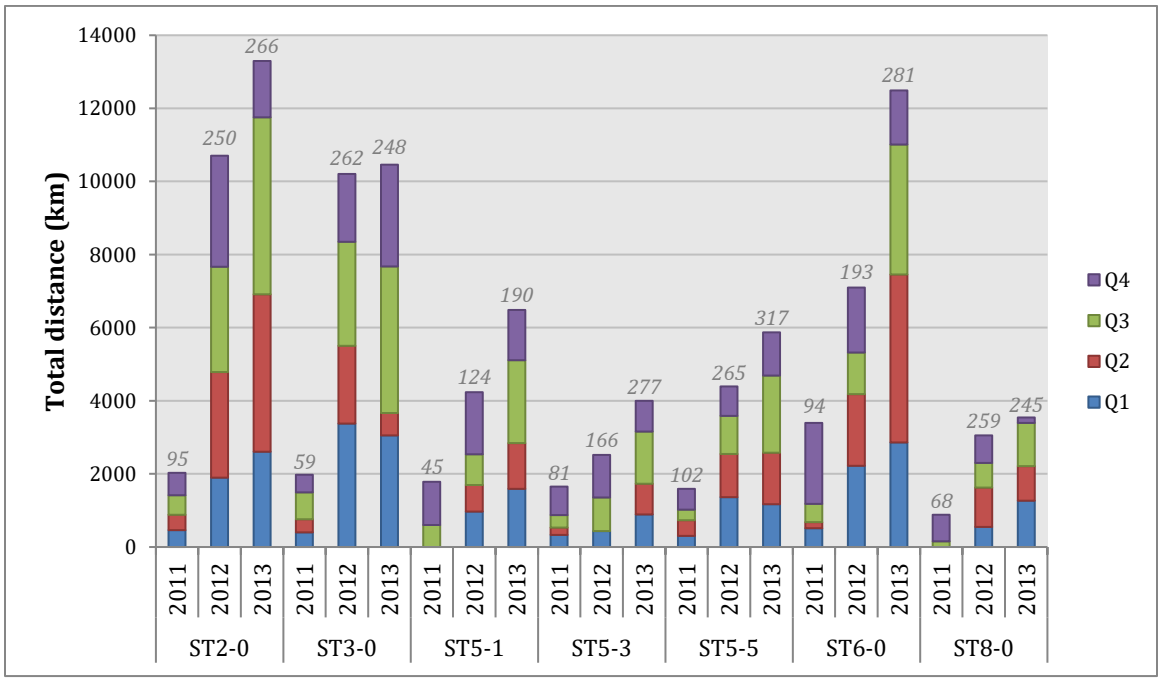
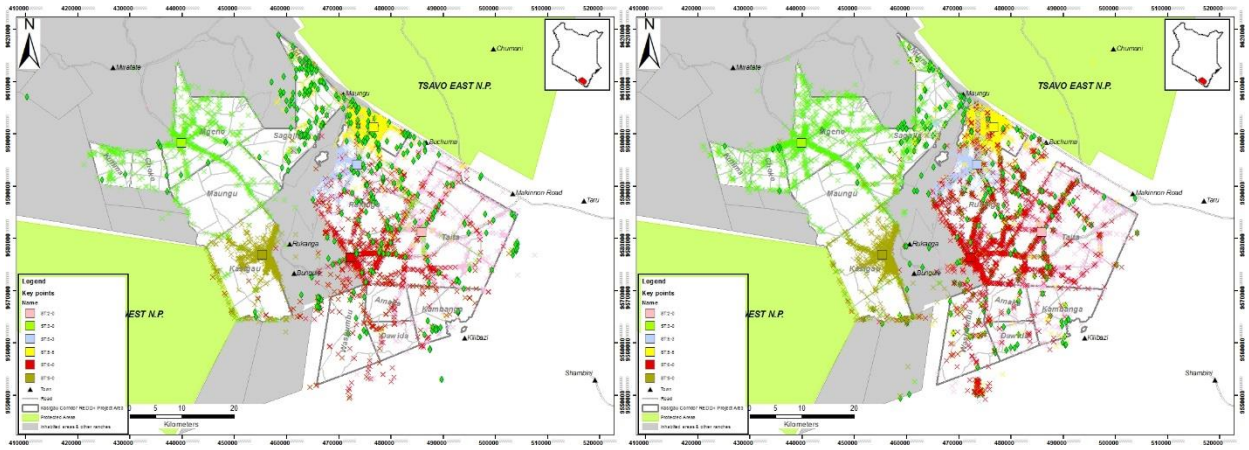


Figure 19**:** Total distance travelled by each of the seven Wildlife Works Ranger outposts between 2011 and 2013 separated by quarter; also shown are the number of days out of 365 that the particular ranger post reported on distance travelled

Table 5**:** Factorial ANOVA results testing the effect of three key variables on the Ranger Patrol effort (measured as mean daily distance travelled); two-way interactions were included

Effect	DF	F	p
Intercept	1	2412.4	<0.0001
OUTPOST	6	79.9	<0.0001
YEAR	2	4.7	0.0092
QUARTER	3	12.5	<0.0001
OUTPOST*YEAR	12	7.5	<0.0001
OUTPOST*QUARTER	18	3.8	<0.0001
YEAR*QUARTER	6	7.9	<0.0001


TSAVO EAST N.P.
Maungu
Mwatate
Ohumani
Bachuma
Sagala
Mgeno
Kasigau
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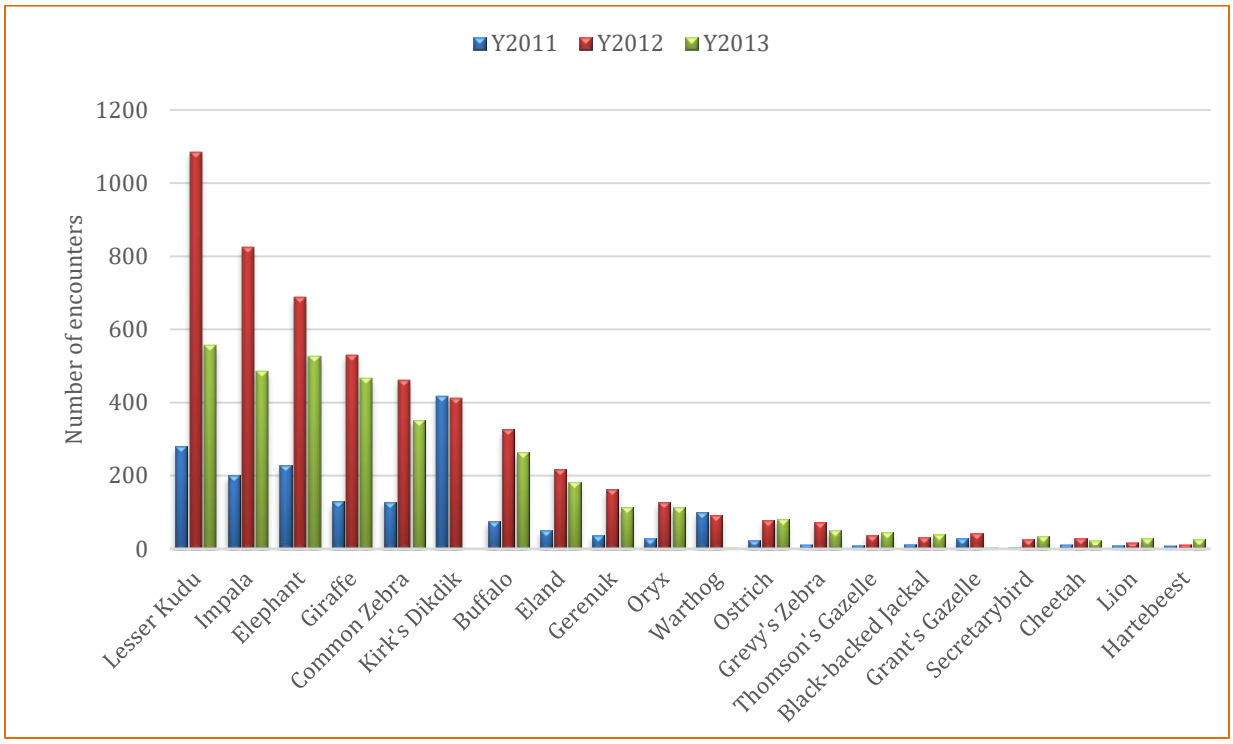


Figure 21: Total number of encounters for the 20 commonest species based on ranger patrol data across the Project Area

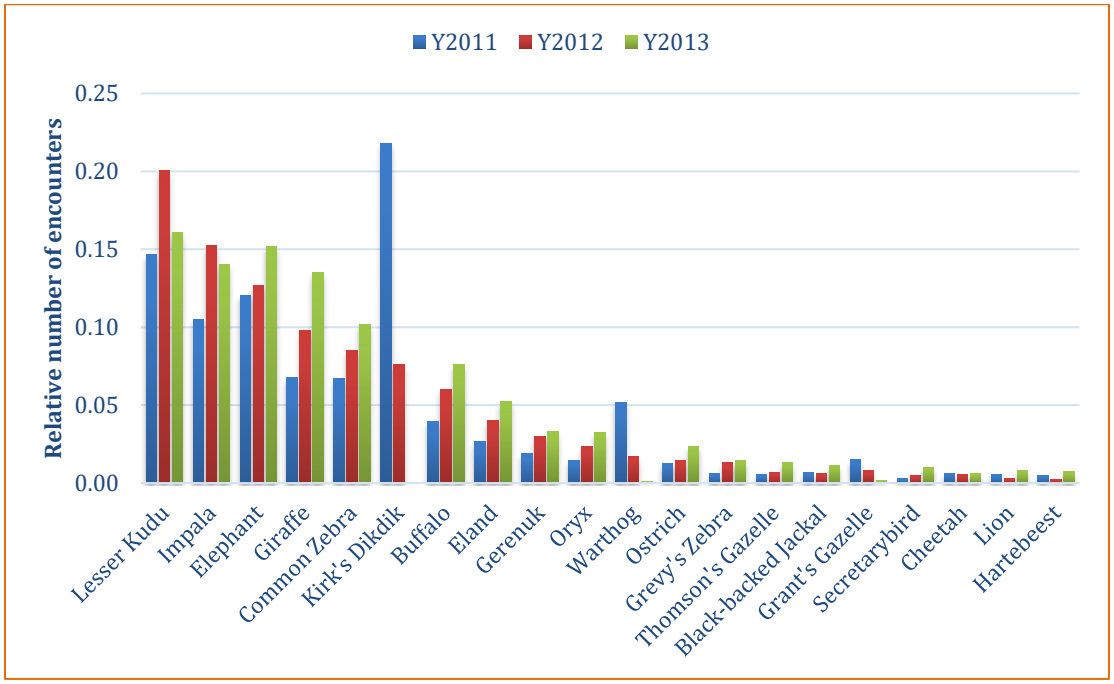


Figure 22: Relative (proportion) number of encounters for the 20 commonest species based on ranger patrol data

High Conservation Value species

In all, there is not a big change between 2012 and 2013 based on the ranger dataset both in the number of encounters and the total numbers of HCV species recorded in the Kasigau REDD+ Corridor Phase I and II Project Areas (Figure 23-25).

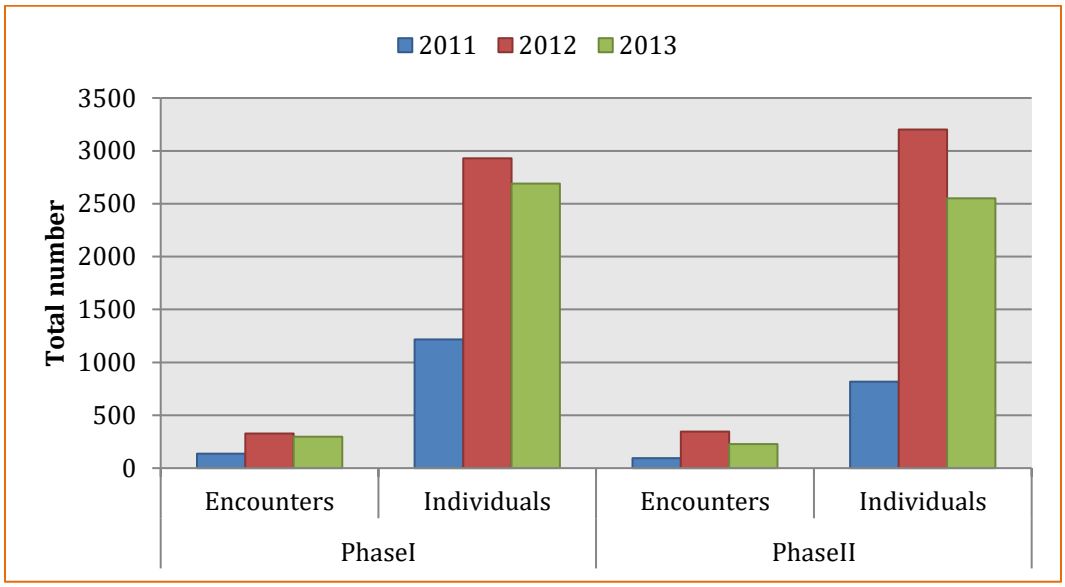


Figure 23: Total number of individuals and encounters of elephants by ranger patrol teams across the Kasigau Corridor REDD+ Phase I and II Project Areas between 2011 and 2013

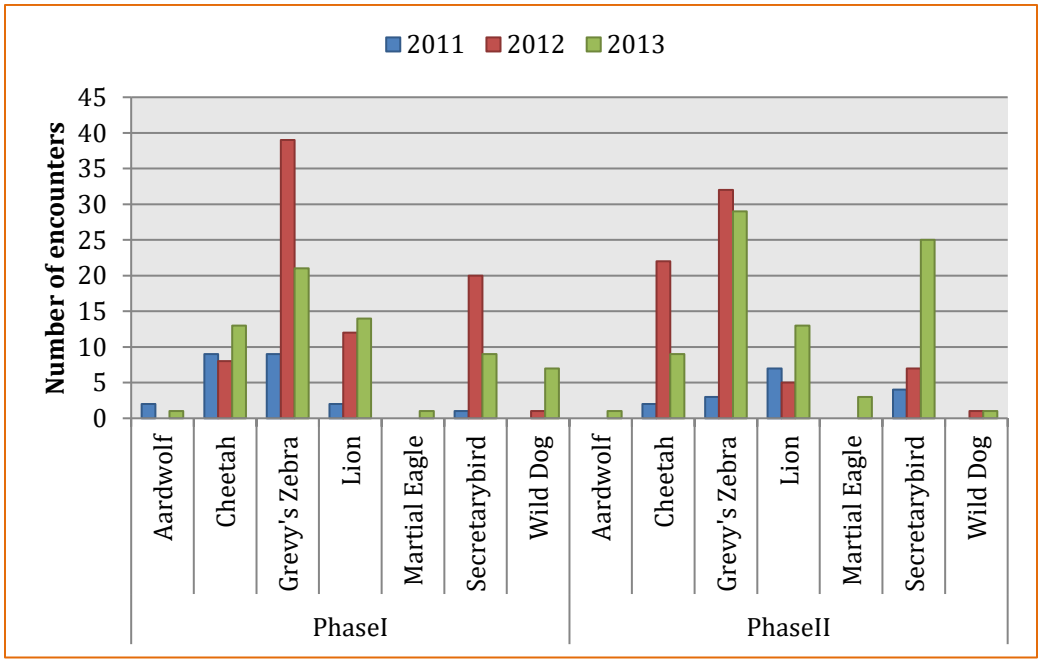


Figure 24: Total number of encounters of other HCV species (excluding elephant) by ranger patrol teams across the Kasigau Corridor REDD+ Project Area between 2011 and 2013

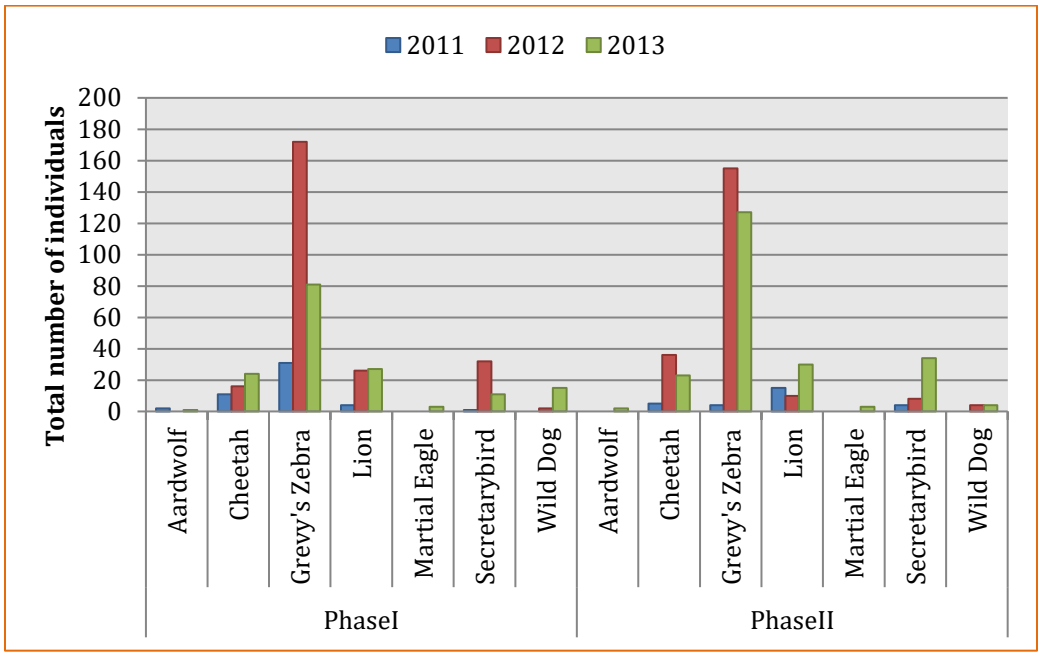


Figure 25: Total number of individuals other HCV species (excluding elephant) by ranger patrol teams across the Kasigau Corridor REDD+ Project Area between 2011 and 2013

The following figures depict the spatial distribution of the wildlife sightings presented in Figure 12 above. As a caveat, there were several times rangers did their patrols without a GPS either due to unit breakdown or other problems. For instance, whilst rangers encountered 1759 incidences of HCVs during this time (2011-2013), only 1171 of these encounters had an associated geographic coordinate. As such the spatial picture depicted is certainly incomplete but is getting increasingly consistent. In all, elephants were the most widely distributed of the HCV species (Figure 26) while sightings for the other species were mainly concentrated in Rukinga and Taita ranches during this period (Figure 27). There was little variation in these sightings across the years.

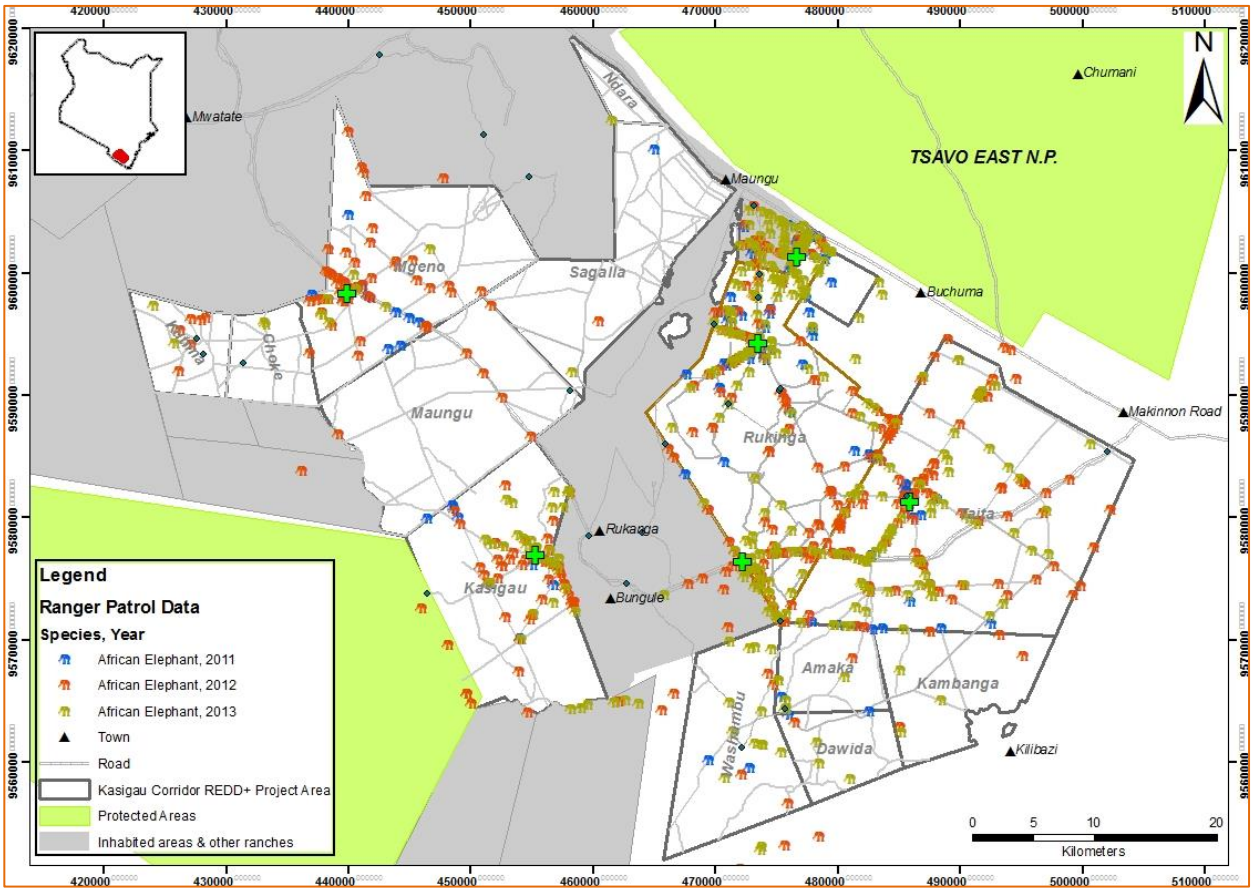


Figure 26: Elephant sightings across the Kasigau Corridor REDD+ Project Phase I and II– 2011-2013. The green crosses on the map show the permanent Ranger Outposts.

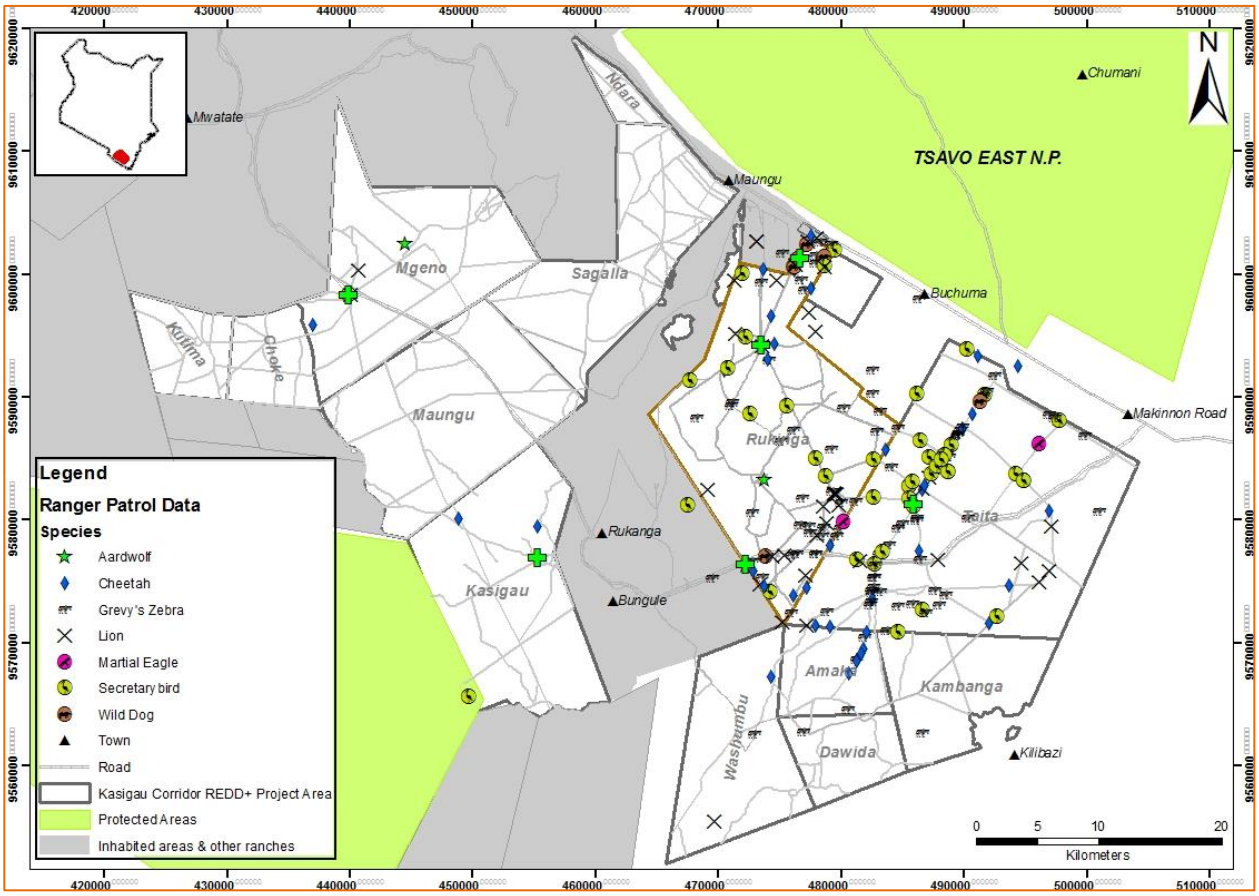


Figure 27: Sightings of HCVs (except Elephants) across the Kasigau Corridor REDD+ Projects Phase I and II combined for 2011-2013. The green crosses on the map show the permanent Ranger Outposts.

Other incidents

Besides species observations, the ranger dataset included data on occurrence of various threats. All incidents recorded during ranger patrols were classified into several categories: Arrestees, Carcasses, Charcoal bags, Grazing, Kilns, Log heaps, and Snares, Poacher Camps, Fire, Foot prints, Human deaths, Injured wildlife and other poaching incidents (e.g., contact with poachers). A total of more than 750 incidents have been recorded across the Project Area between 2010 and 2014, with close to 70% being in the Phase II ranches, 25% in Phase I (Rukinga) and the rest (5%) in areas outside the REDD+ project accounting area. The number of incidents seems to be generally declining from the peak in 2011, which is the year that intensive patrolling took off, especially in Phase II (Figure 28). (NB: the 2014 dataset is not complete, and grazing was not included as an 'incident' in Phase II because it was not illegal there). However, the number of units involved per incident e.g., number of individual animals grazing, number of carcasses, and number of kilns follows a slightly different pattern, exemplified by the untypically high number of charcoal bags impounded within Phase II of the Project Area in 2011 (Figure 29). Thus, although the number of incidents showed little variation, the impact could be strikingly different when such huge variation in the actual incident units prevails.

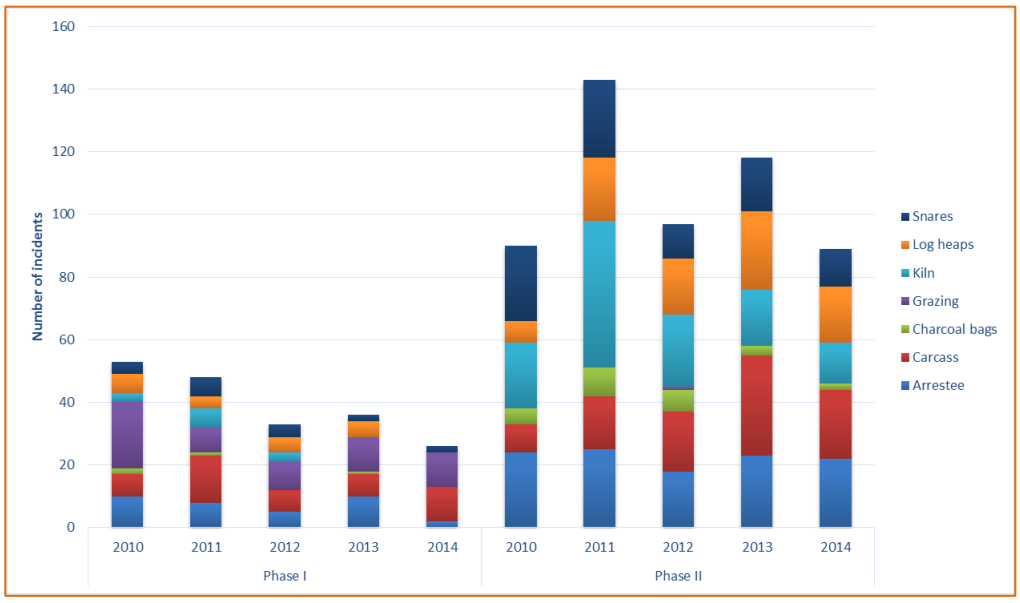


Figure 28: Overall trends for the major illegal incidents reported by the ranger patrol teams between 2010 and 2014 across the entire project area (NB: grazing is not considered an illegal activity for the Kasigau Corridor REDD+ Project Phase II ranches during this period).

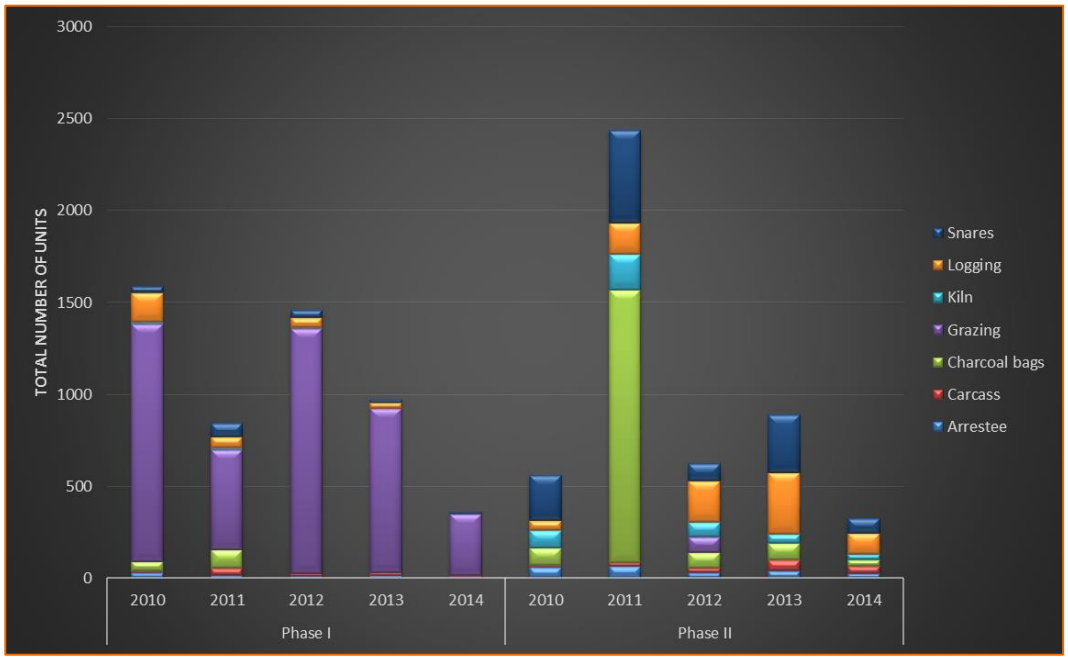


Figure 29: Variation in number of units for each incident category between 2010 and 2014 across the project accounting areas

2.3.11.4 Daily logs

A Daily Log system has been running since June 2011 where various people going about their activities note down species of interest they encounter also noting their position using a hand-held GPS or an approximate position based on a set grid system (for Rukinga Ranch). So far,

1,214 valid records have been obtained, mainly sightings (89%) but also calls (10%). A majority of these have been in Rukinga Ranch (81%) with Taita representing most of the rest (7%). Overall, sightings were dominated by elephants (43%) although these are not always reported; other commonly spotted species of conservation interest (HCVs) were lion (5%), cheetah (9%), Grevy's zebra (4.5%) and secretary bird (8%), whilst others were less common such as the African wild dog, various vulture and raptor species (Figure 30). Crucially, 2014 daily log data enabled recording of the first Wild dog den (Figure 31) in Rukinga Ranch which led to the publication of a peer-reviewed article on the status of this Endangered species across the entire the REDD+ Project Area (Githiru et al. 2014).

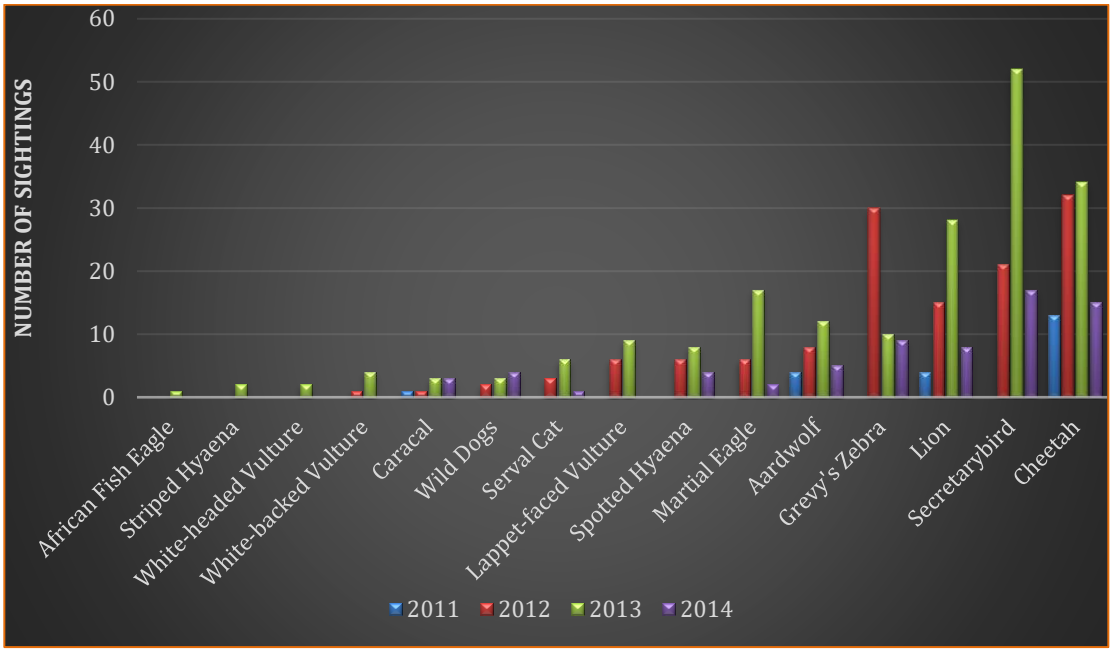


Figure 30: Number of encounters of all species of interest recorded anecdotally within the Kasigau Corridor REDD+ Project Area between 2011 and 2014 (NB: Elephants are excluded for clarity; their respective 2011-2014 total number of encounters were: 55, 260, 94, and 59; also note 2014 dataset is incomplete).



Figure 31: Camera Trap image of an adult African Wild Dog regurgitating food for young pups in Rukinga Wildlife Sanctuary

2.3.11.5 Community monitors

In Dec 2011, Wildlife Works initiated a pilot community-based wildlife monitoring scheme, currently spread across the following eight areas within the Kasigau Corridor REDD+ Project Zone: Zongowani; Talio Dip/Mazola; Kajire/Kishamba; Makwasinyi; Jora; Bungule; Sasenyi; and Kale/Buguta/Mkamenyi/Birikani. In each of these sites, we identified a community member who records all incidences of wildlife, with a special focus on Species of Concern (Figure 32 below), either from a conservation or a human-wildlife conflict perspective. 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 for swift response systems and mitigation measures.



Figure 32: The species of concern that are present in the Kasigau Corridor REDD+ Project Phase I Project Area.

Between January 2012 and April 2014, total of 693 incidents have been reported by our monitors. Some highlights from this dataset include:

- A clear indication of the annual trend in conflicts with April-July (Figure 33) being low conflict months in general which could be due to the lack of crops given that the predominant conflict involves crop damage by elephants (60% of all conflicts). Curiously, the livestock predation seems to follow a similar pattern although this might require several years of data ascertain and establish possible reason for this. Other commonly reported sources of conflict included: Hyaena (29%), Baboon (3%), White-tailed mongoose (2%) and 1% each for lion, warthog, leopard and eland

- Spatially, some of the select regions fared worse that others in terms of frequency of incidences, with Makwasinyi seemingly being the hardest hit overall, followed by Teri “B” area (Figure 34). This will be ascertained then followed up to eliminate any possible confounding reasons (such as area covered, and dependability of the monitor) before more effort is placed in the hardest hit areas to seek solutions.

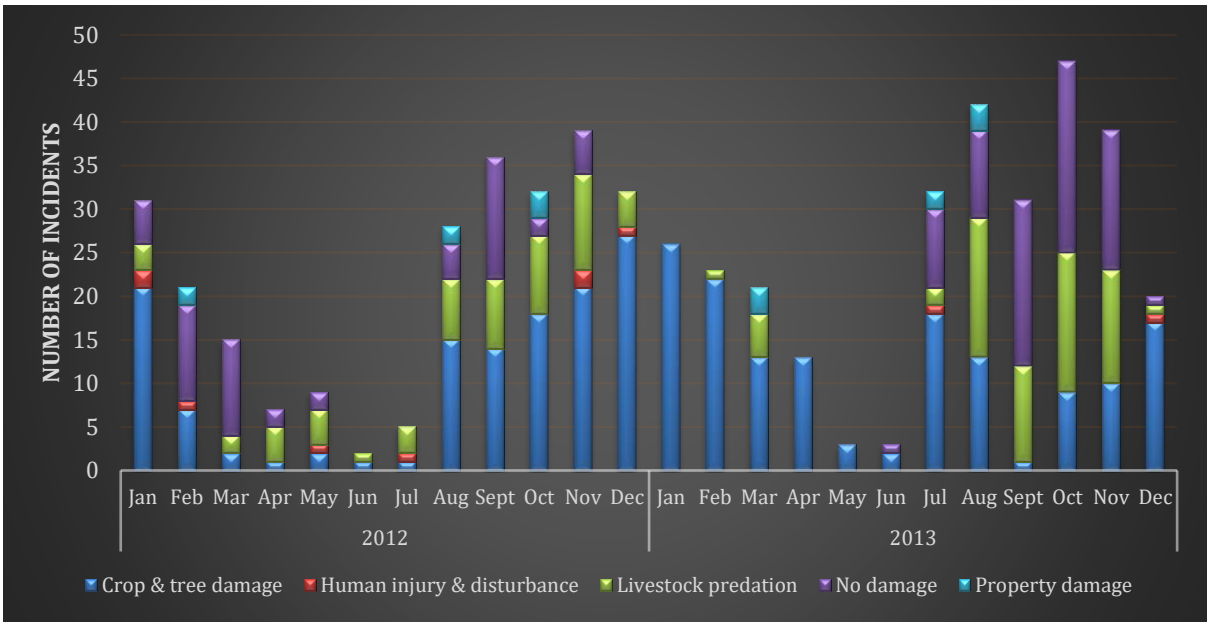


Figure 33: Monthly trends in prevalence of different forms of human-wildlife conflict as reported by the community monitors in villages adjacent to the Kasigau Corridor REDD+ Project Phases I and II Project Area

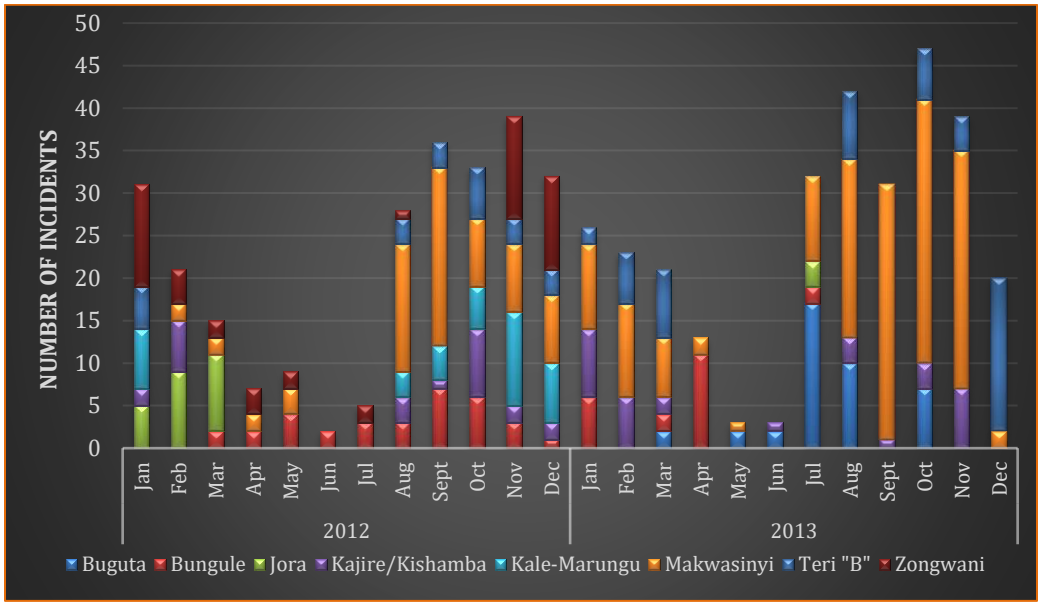


Figure 34: Monthly trends in prevalence of human-wildlife conflict in villages adjacent to the Kasigau Corridor REDD+ ProjectPhases I and II Project Area as reported by the community monitors

2.3.11.6 Camera traps

Camera traps were deployed in 24 random sites in Rukinga ranch from August 2011 to June 2014; six Moultrie or Bushnell camera traps are used in four 3-week rotations so as to cover each of the 24 sites at least once every quarter. 12 complete rotations were completed during this

reporting period with the 13th rotation on-going, representing a total of about 4949 effective trap days (NB: this number is actually lower than would be expected given this time period due to few times when some camera traps malfunctioned during a session).

During this time, a total of 2931 independent photographs of 4517 individuals comprising of 36 different species (33 mammalian and 3 avian) were taken. The most photographed species in Rukinga were lesser kudu *Tragelaphus imberbis,* elephant *Loxodonta Africana*, Giraffe *Giraffa camelopardalis*, common zebra *Equus burchellii* and African Buffalo *Syncerus caffer*; they were also the commonest by number, while the most common carnivores included aardwolf *Proteles cristata*, spotted hyena *Crocuta crocuta* and lion *Panthera leo* (Figure 35). In all, the camera traps detected seven High Conservation Value species that are listed under some category of threat globally in the latest IUCN Red List: Elephant, Grevy's zebra, Lion, African wild dog, Leopard, Cheetah and Secretary bird. Although the trends suggest decreasing encounters (NB: a similar trend is observed when considering numbers), it is worth noting that the 2014 data represent half-year data so may not represent annual variability for species like elephants. Elephants were captured across the entire ranch over this time, with some slight variation in spatial concentration across the years and a general tendency to avoid boundaries with areas inhabited by humans (Figure 36).

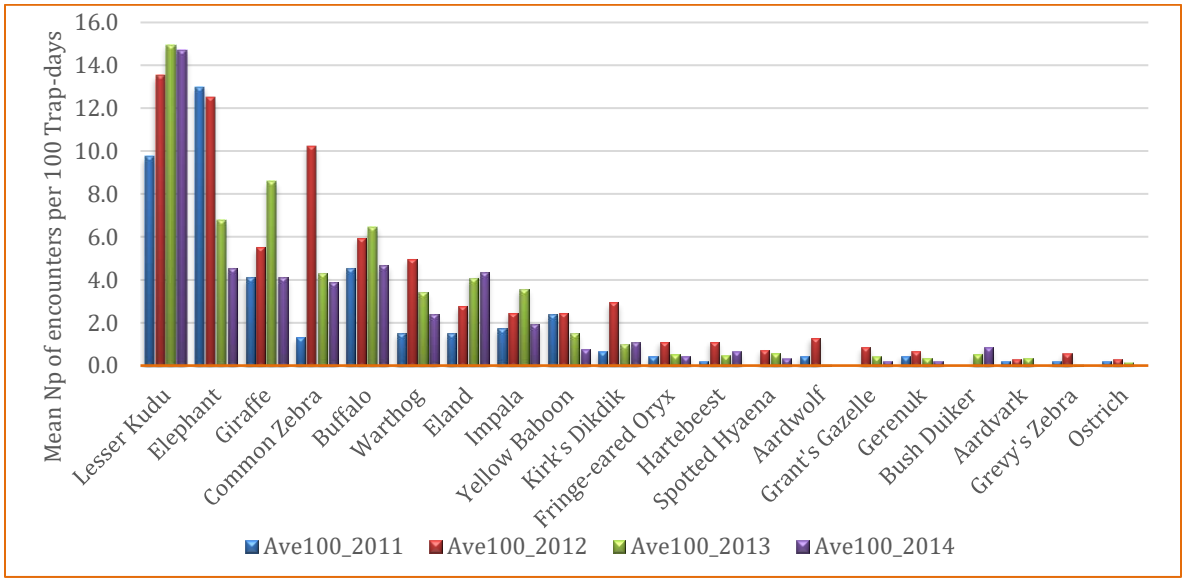


Figure 35: Number of encounters (Independent Photo Events) per 100 trap-days for the top 20 most common species observed on camera traps.

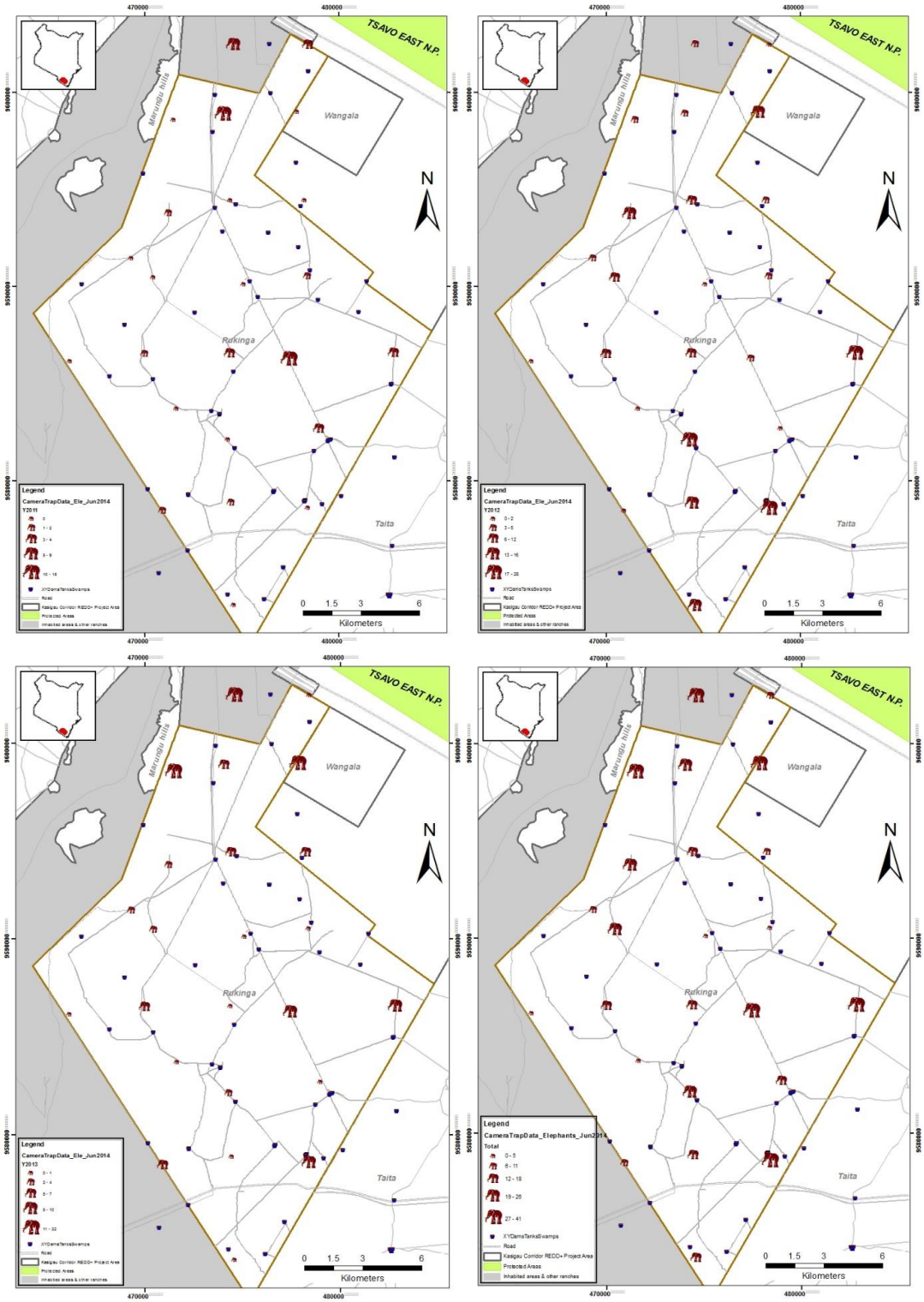


Figure 36: Elephant prevalence across Rukinga Ranch in 2011, 2012, 2013 and overall based on number of times captured on camera traps

2.3.11.7 Habitat Monitoring

We have three habitat monitoring fronts, apart from the biomass (carbon) monitoring. The two main goals of monitoring the vegetation are (i) to understand the species diversity, composition and dynamics, and (ii) to use this as a basis for evaluating the impact of growing elephant populations on the vegetation, besides measuring other forms of disturbance and regeneration.

Carbon plots

The 512 permanent carbon biomass sampling plots across Phases I and II of the Kasigau Corridor REDD+ Project contain 15,136 individually measured trees which shall be monitored over the project lifetime for CO_2 estimation purposes. The tree database provides an opportunity to assess vegetation diversity, composition and structure. Using program Estimates (Colwell 2013), the computed number of species (S) for the Kasigau Corridor REDD+ Project Phase I Project Area was 62±11, with the rarefaction curve suggesting that this comprises most of the species in this ecosystem (Figure 36). Different ranches had a different proportion of the 62, with Rukinga leading the way with 44 (Figure 37). Overall Shannon diversity index (H) was 2.66 with an evenness (E) of 0.64; ranch-wise, Mgeno had the highest diversity index (2.67) while Ndara was the most even (0.89) (Figure 37). The top-three commonest species across the landscape are *Commiphora confusa* (26%), *C. campestris* (15%) and *Lannea alata* (10%) (Figure 38). To a large extent, the commonest trees by number were also the most widespread, in terms of number of plots in which they occurred (Figure 39). Except for a few, these common trees also occurred across the 14 ranches but in different proportions. Based on the similarities in species assemblages, a simple clustering tree was generated for the 14 ranches in the REDD+ Project Area showing how they resemble in terms of tree species diversity (Figure 40). These analyses will be expanded and written as a stand-alone publication and will be re-assessed for any variation during the project lifetime.

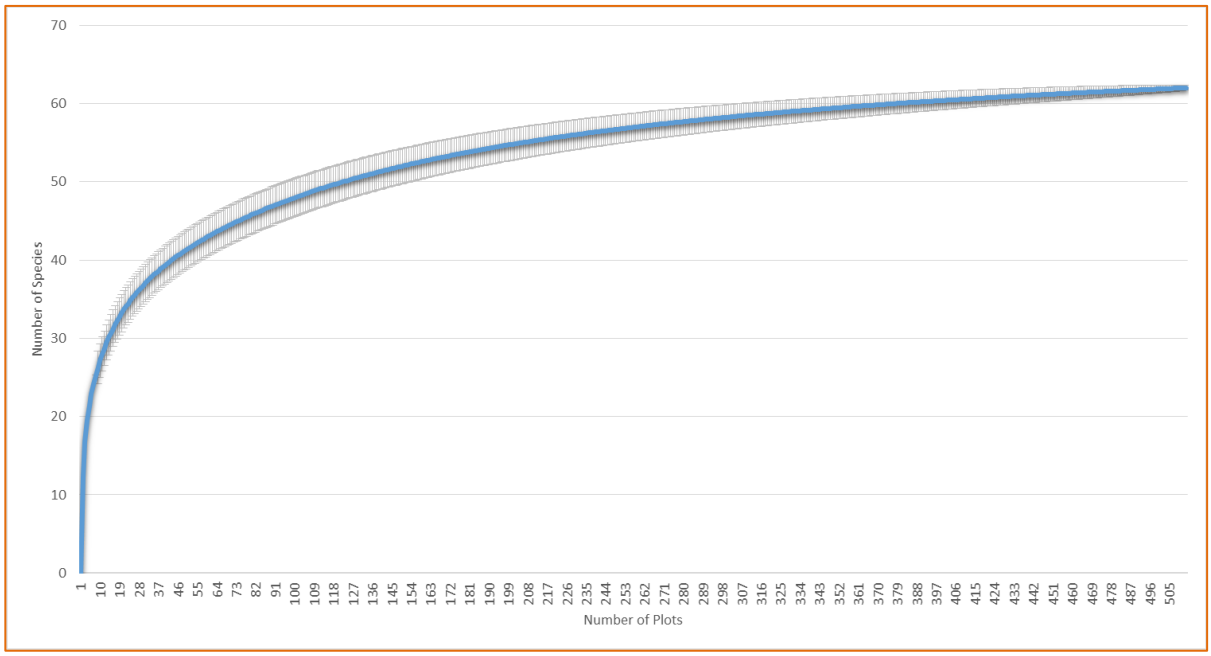


Figure 37**:** Rarefaction curve in Estimates showing the increase in new tree species as number of plots samples increases

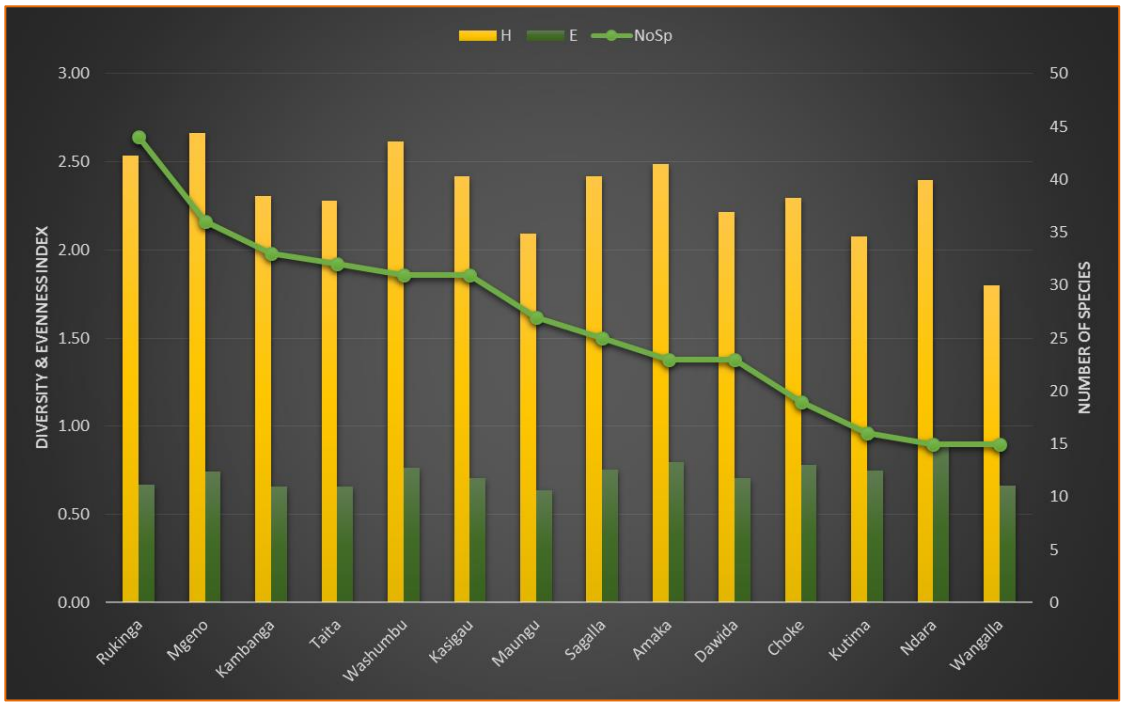


Figure 38: Species richness, diversity (H) and evenness (E) across the 14 ranches included in the Kasigau Corridor REDD+ Project Phases I and II.

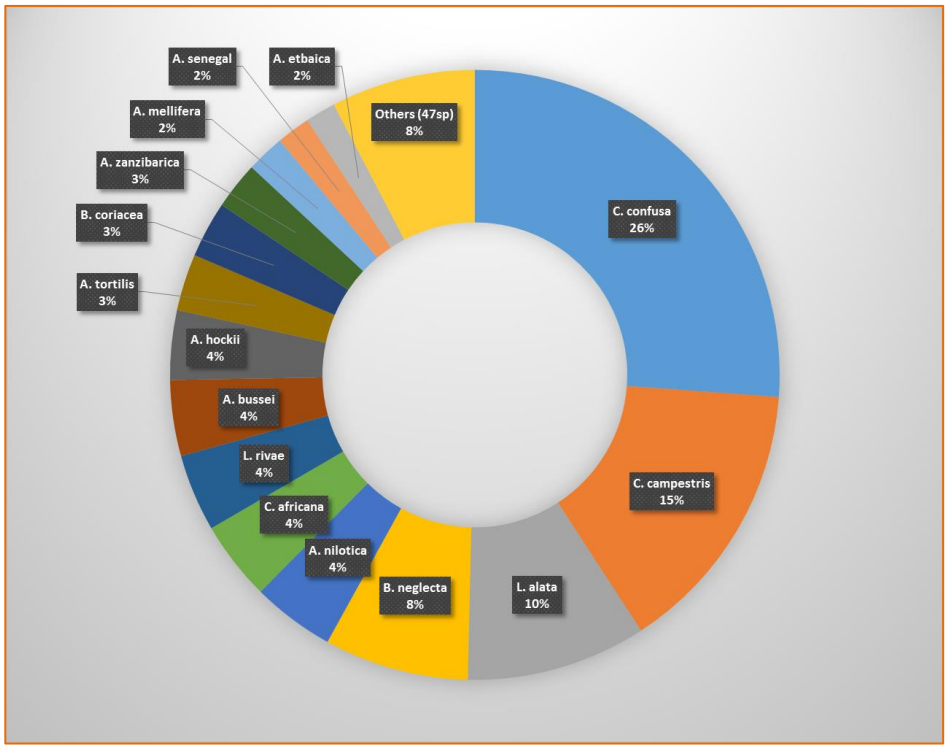


Figure 39: 20 commonest tree species by number of individuals recorded in the 512 plots sampled across the Kasigau Corridor REDD+ Project Phases I and II Project Area

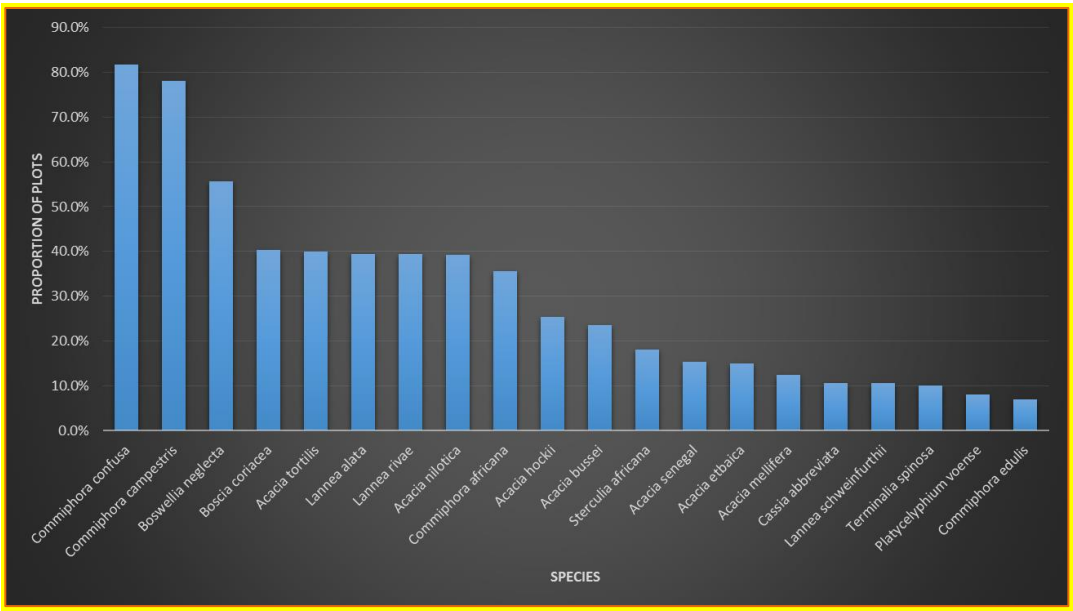


Figure 40: 20 commonest tree species by number of plots they were recorded in out of the 512 plots sampled across the Kasigau Corridor REDD+ Project Phases I and II Project Area

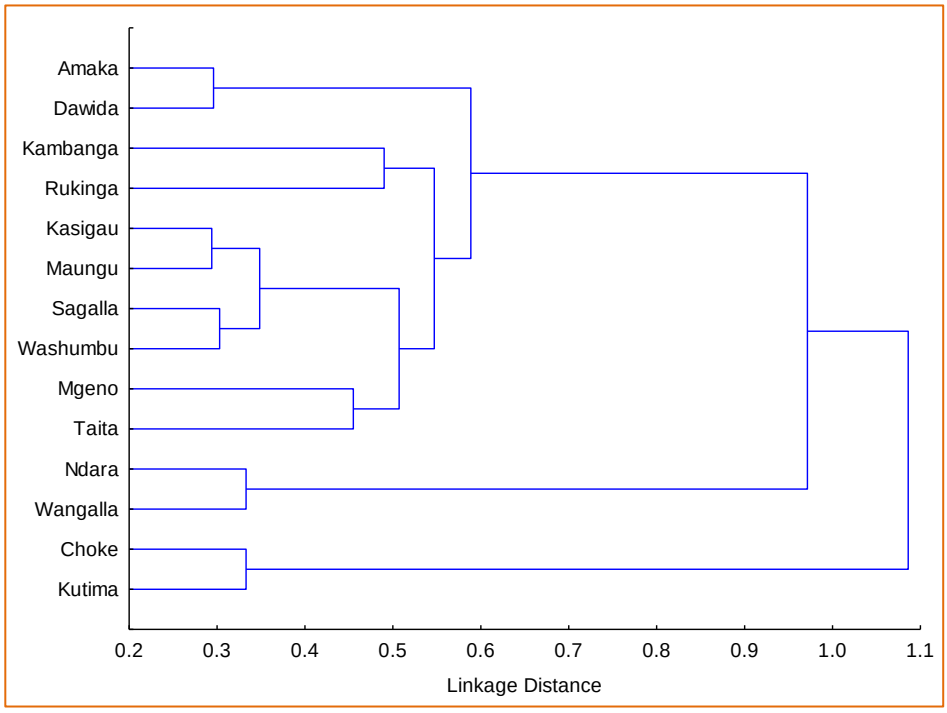


Figure 41: Tree clustering diagram based on the Jaccard's pairwise dissimilarities between ranches as estimated by EstimateS for the 14 ranches (based on Ward's Method to evaluate the distances between clusters).

Finally, overall, most of the trees in the plots were alive and either standing (87%) or lying (7%), while the rest were either standing dead (3%) or lying dead (3%); the tree status did not differ very much across the different ranches. These and other incidences of elephant tree damage will be monitored both within these biomass sampling plots as well as in other areas of the project area (see next section). In addition, the number of saplings and seedlings will be assessed in smaller concentric plots within these permanent carbon plots to assess regeneration.

Waterhole transects – piosphere effects

Thirteen waterholes, some of which were recently re-scooped while others may be re-scooped at a later date, are currently monitored for piosphere effects where two permanent 1 km transects were established radiating away from the waterhole in opposite directions. Along each transect, six permanent 0.1ha plots were set every 200 m. All trees and shrubs are identified and 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. Plots will be monitored annually to track changed in elephant-related damage on trees as waterholes are scooped and silted over during the project lifetime. Initial trends suggest that the total number of trees varied significantly across waterholes and the rate of disturbance also differed between them (Figure 42); there was also a trend towards more undisturbed trees away from the waterhole (Figure 43). These data will be analysed further by species to evaluate tree species impact over and above the waterhole and distance effects.

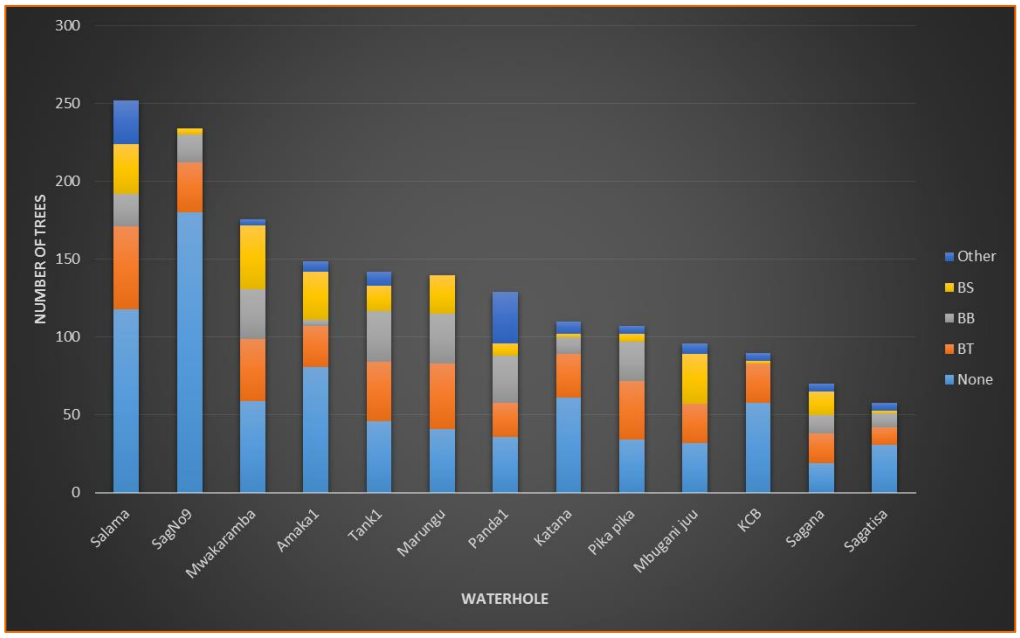


Figure 42: Total number of trees counted in the plots along the two transects at each waterhole and their status (NB: BS=Broken stem; BB=Broken branch; BT=Broken twig)

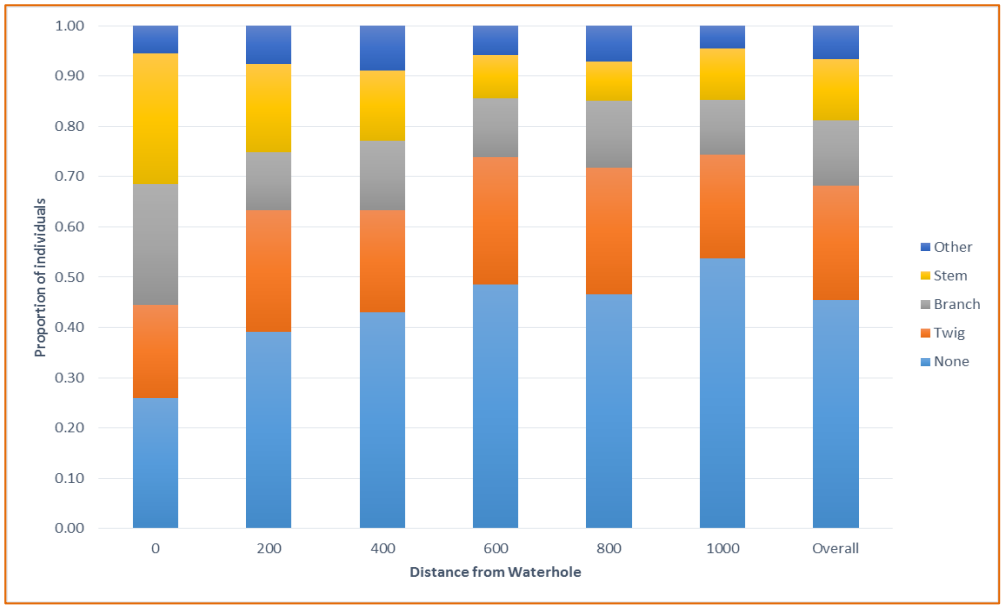


Figure 43: Overall disturbance on trees within plots along the two transects at each waterhole combined for the 13 waterholes

Elephant feeding transect – Rukinga Ranch

We sampled a 13-km transect running along the base of Marungu Hills in Rukinga Ranch to study elephant foraging patterns. This area was selected because it is an important dry season habitat for elephants, being one of the last green areas due to the moisture from cloud capture by the Marungu Hills. We set 55, 30m^2 plots every 250 m on alternative sides of the transect (Figure 44) within which we assessed impacts of recent elephant feeding on trees and shrubs. Two sampling sessions have been completed: S1 in Aug 2012, and S2 in Jul-Aug 2013. A majority of trees had

some elephant feeding effect even if not recent covering different part of tree. Over the two sessions, elephant impact seem to have increased as shown by the decline in the percent trees showing *No Effect*, with most of the disturbance being on the branch and twigs (Figure 45). Lastly, of 30 different tree species recorded along this transect, elephant impact was different across species with some species like *Acacia bussei*, *A. tortilis* and *Platycelyphium voense* being seemingly preferred and others less so e.g., *Salvadora persica* and *Boscia angustifolia* (Figure 46).

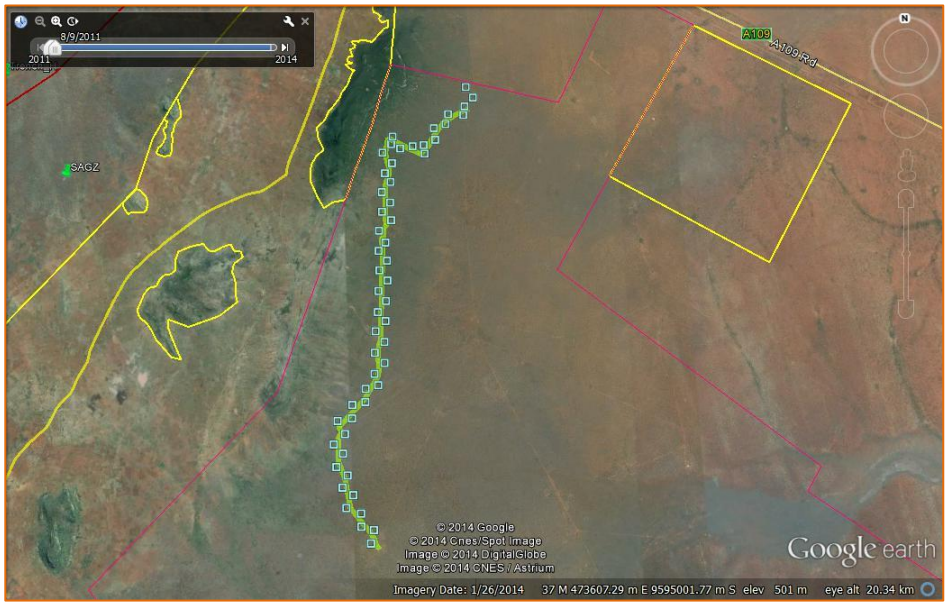


Figure 44: The 13-km transect running from Garawa Tank to Lokidori in Rukinga Ranch, along which 55 permanent plots have been established for monitoring elephant feeding intensity and patterns

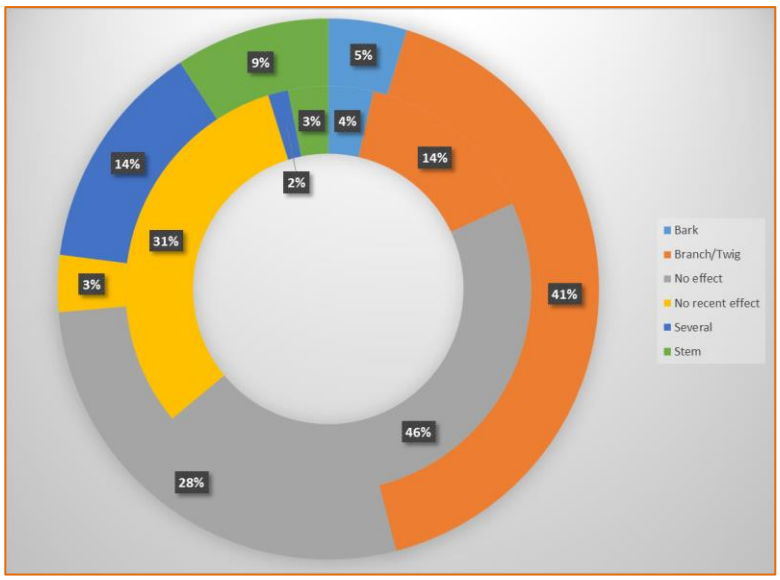


Figure 45: Proportion of trees with various elephant feeding signs within plots along the Garawa-Lokidori transect for Session 1 (inner chart) and Session 2 (outer chart).

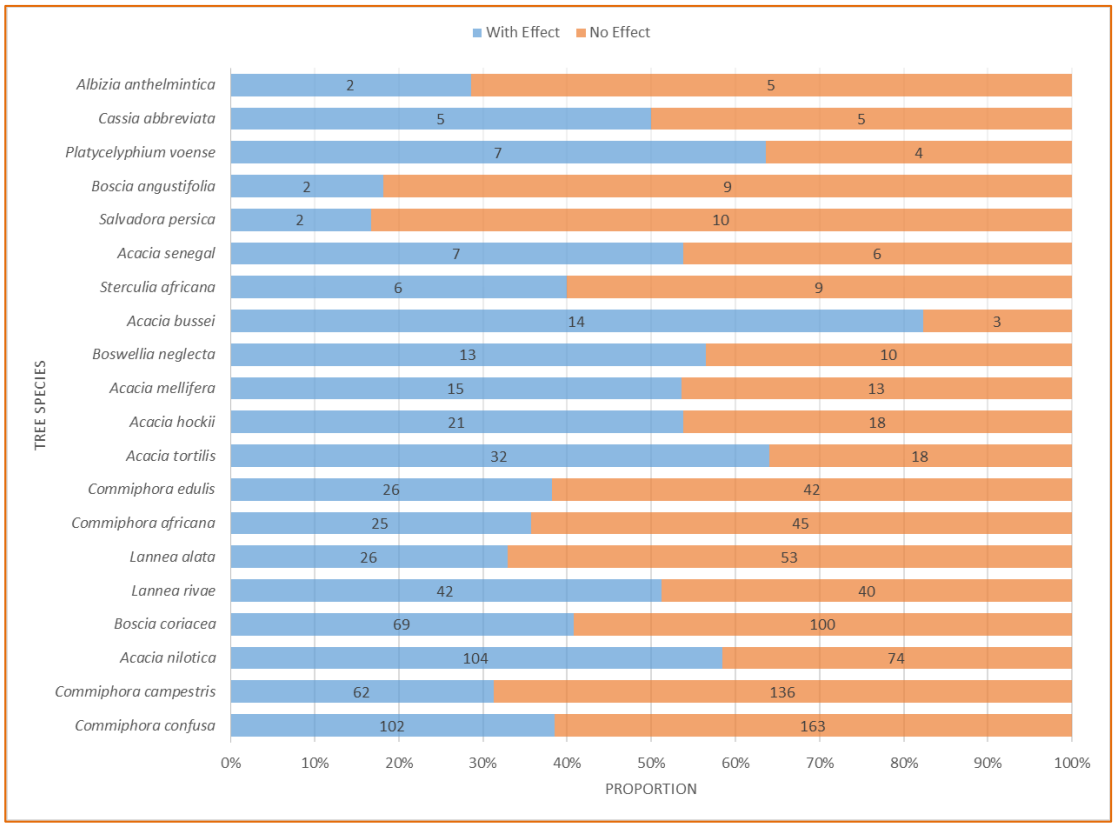


Figure 46: Proportion of individuals of different tree species having elephant feeding effects within plots along the Garawa-Lokidori transect (inset are total number of individuals sampled along the entire transect from which these proportions are derived)

2.3.11.8 Mt. Kasigau Conservation Monitoring

Elevation Gradient Bird Monitoring

Four mist net lines for bird capturing were set-up at different elevations in Mt. Kasigau (Figure 47): 850m, 1100m, 1320m and 1550m. Between July 2011 and Oct 2014 and over 11 ringing sessions, 1041 individual birds have been captured comprising 49 species in total; there has been an additional 315 incidents where some of these 1041 individuals have been recaptured at least once. Overall, the White-starred Robin was the commonest species captured (Figure 48). 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. The Striped Pipit is endemic to southeast Kenya and northeast Tanzania, with an altitude habit range that has been described as between 1500 and 2000 m. Therefore, our capture could represent a confirmed altitudinal range extension, as it was captured at Site II which is at an elevation of 1100m. Finally, Site IV had the highest number of birds captured overall with 547, followed by Site I, II and III with 308, 267 and 234, respectively. Interestingly, most species were captured exclusively in one Site or predominantly in one or two sites (Figure 49), and hence could enable us assess trends over time, should there be significant range shifts, e.g., due to climate change. It would be interesting, for instance, to check whether species like Red-fronted Tinkerbird, Northern Brownbul, Spot-flanked Barbet, Zanzibar Greenbul or Black-backed Puffback only captured in lower elevations (Figure 49) start appearing in Sites III and IV.



Figure 47: Four sites where mist nets for capturing birds were erected (in green pins) and 20 sites where vegetation data were collected (in pink pins) along the Mt. Kasigau elevational gradient

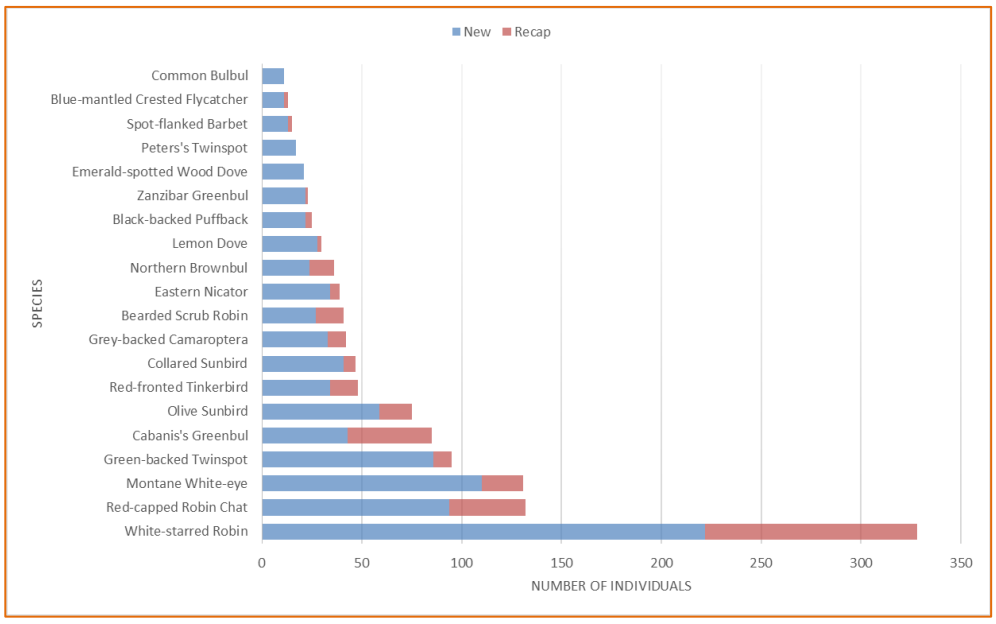


Figure 48: Total number of individuals observed of the top 20 most common species (new captures and recaptures) on Mt. Kasigau between 2011 and 2014 combined from the four sample points located at differnet elevations

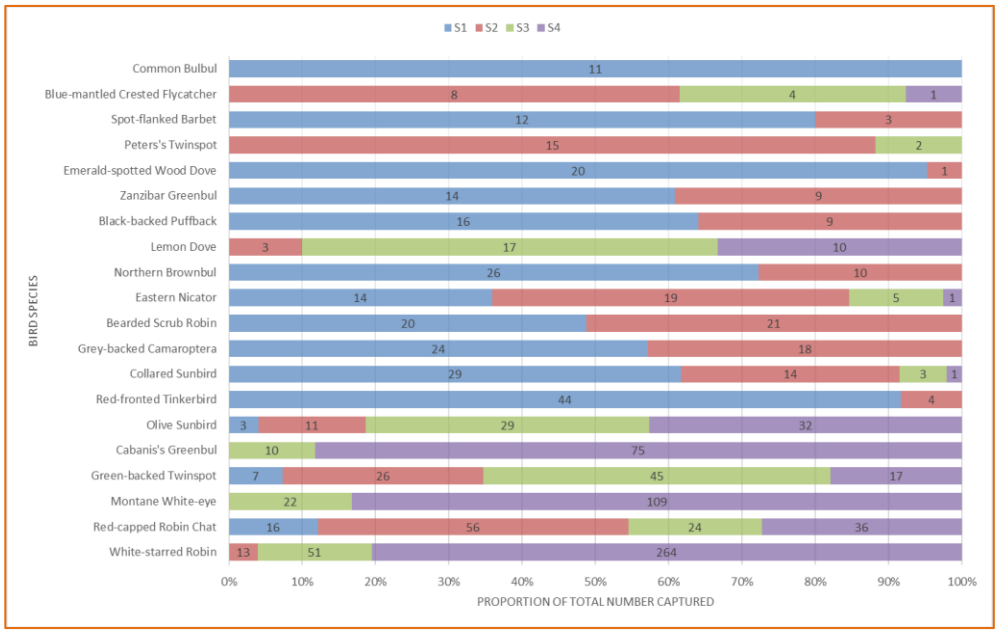


Figure 49: Total number of individuals of the top 20 most common species either captured or recaptured at each of the four elevations (Site 1-4) at Mt. Kasigau between 2011 and 2014 (inset are the number of individuals captured, from which the proportions are derived).

Elevation Gradient Vegetation Monitoring

A total of 20 permanent, 0.1ha 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 47) so that any concurrent changes in birds and vegetation characteristics can be compared. Tree and shrub data collected include species richness and diversity, as well as vegetation vertical diversity and canopy cover. These vegetation data will be collected annually or biennially, with the first session being done in April-May 2012. During this initial session, a total of 453 individual trees were counted in the 20 plots, comprising of 63 different species. Number of trees per plot ranged from 6 to 52, while number of species varied between 1 and 15 (Figure 50). Further the data suggest substantial variation in species richness across plots (Figure 51), which, alongside abundance, will be a key aspect of monitoring change in the long term.

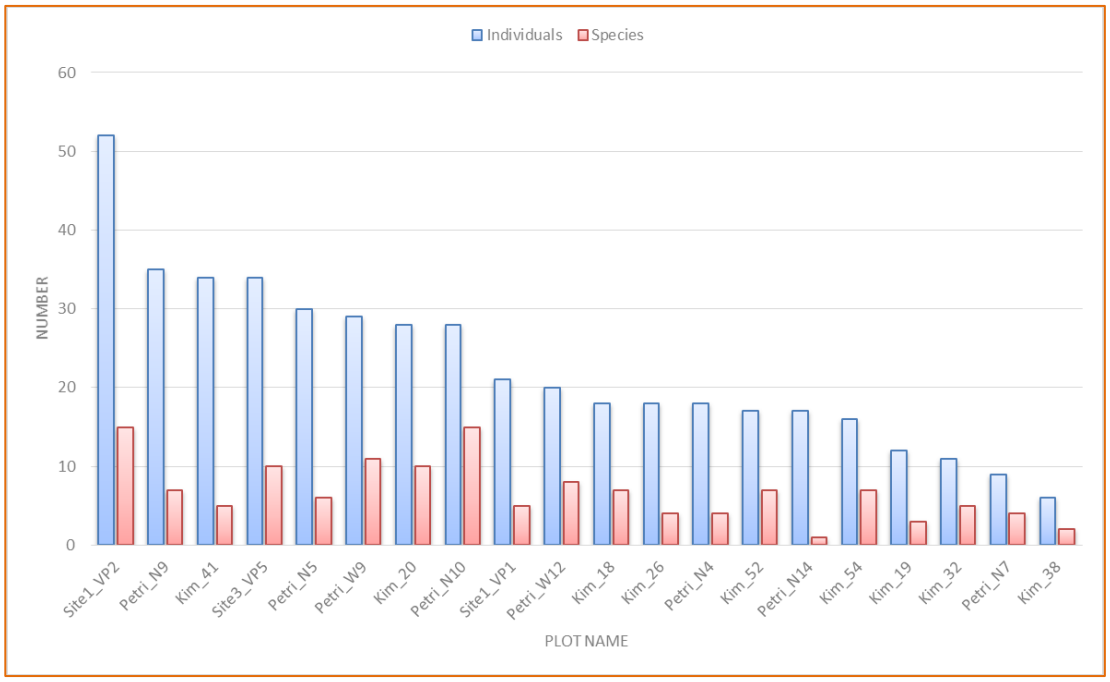


Figure 50: Number of species and number of individuals trees observed in each of the 20 permanent plots along the elevation gradient on Mt. Kasigau

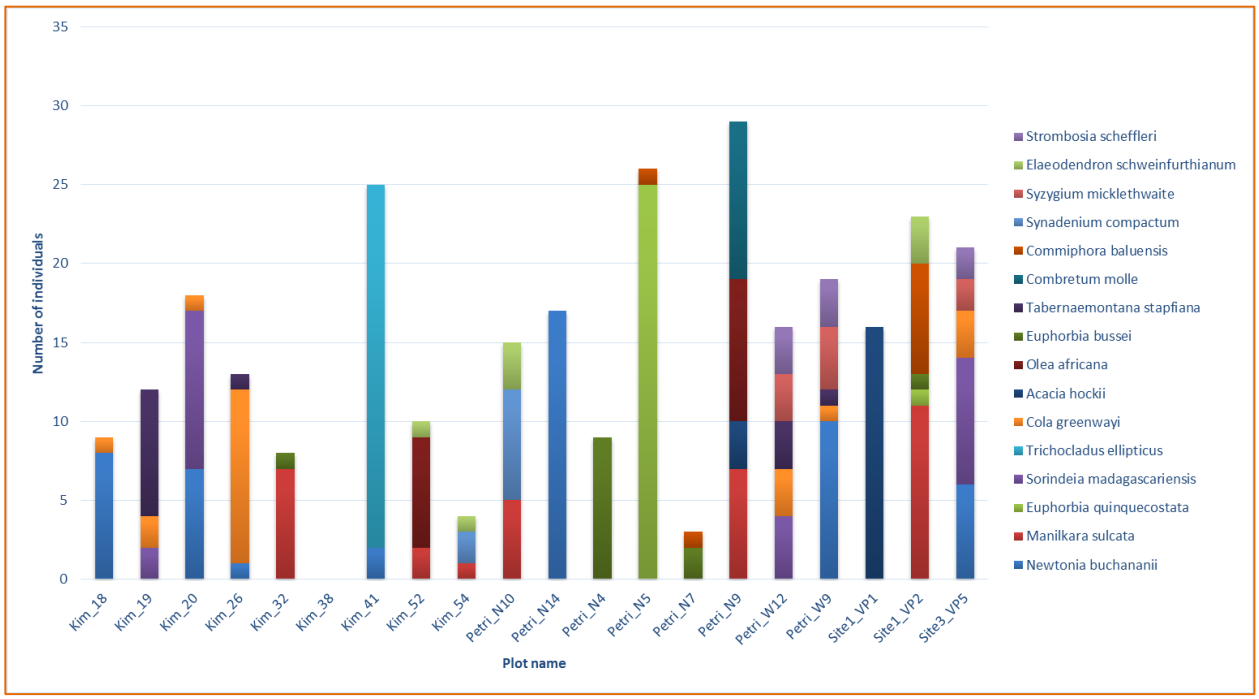


Figure 51: Number of individuals of different tree species within each of the 20 permanent plots located along the elevation gradient in Mt. Kasigau.

2.3.11.9 Social Monitoring

Household survey

The bulk of our social impact monitoring is done using a household-level survey administered on 212 randomly-selected households across the six Locations in the Project area (Figure 52). The first (baseline) survey was completed in April 2012 and comprised 180 households, while the second was completed in August 2013 (183 households). In the 2013 survey, 29 of the 2012 households were not interviewed mainly due to the households having relocated, so 32 new households were added. The intention is that with 212 households in total, and a baseline of either 2012 or 2013, annual repeat surveys will relocate at least 180 households which is approximately 30 per location to assess progress with key indicators as the carbon project is implemented.

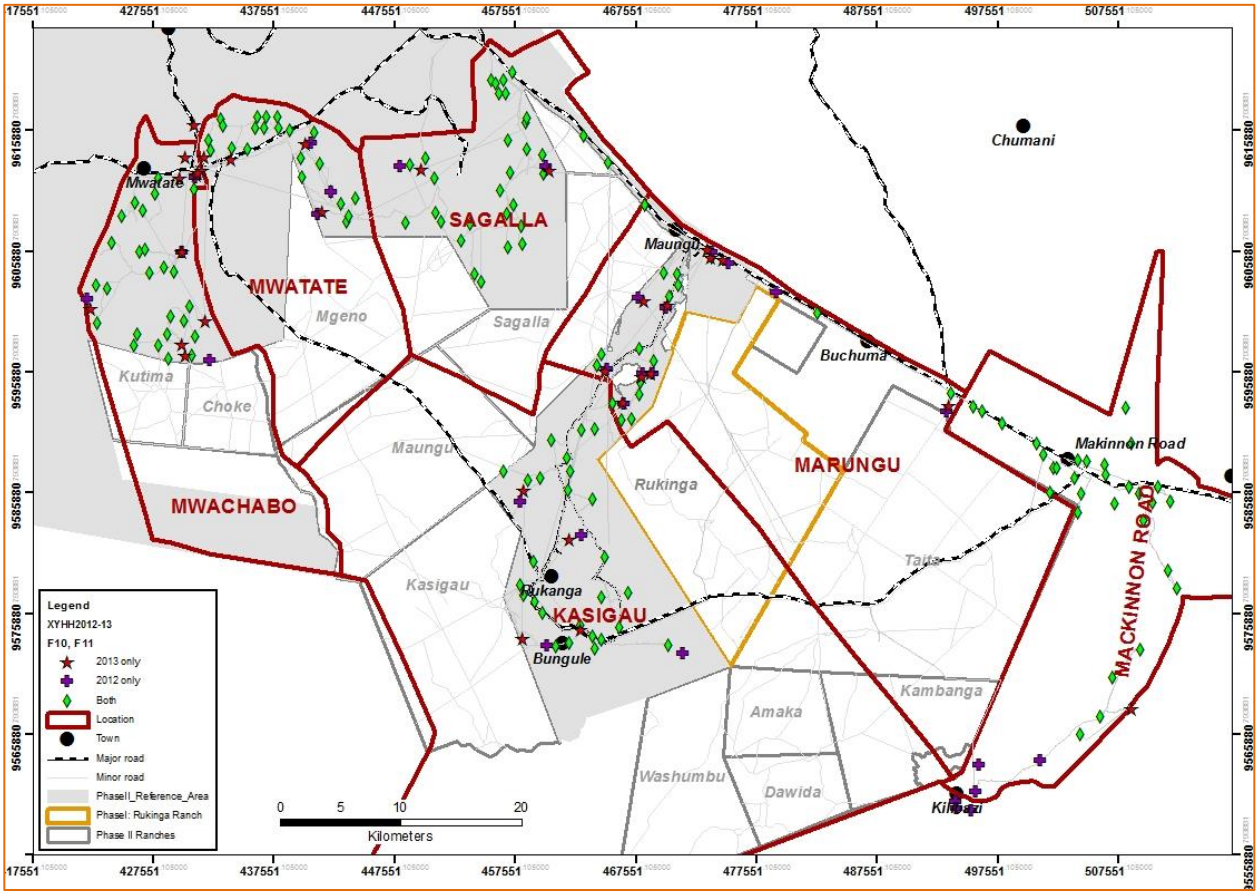


Figure 52: Households where the Social Impact Assessment questionnaire was administered for the Kasigau Corridor REDD+ Project Phases I and II in 2012 and 2013.

While the complete household survey report is available for the auditors upon request, some key highlights and differences between the 2012 and 2013 datasets include:

Scope

- Data were collected from 183 households spread across 83 villages across the six administrative Locations falling within the Kasigau Corridor REDD+ Project Phases I and II Project Area: Kasigau 30, MacKinnon Road 30, Marungu 30, Mwachabo 31, Mwatate 30 and Sagalla 32

Basic demography

- Predominance of Duruma in MacKinnon Road Location still stood out in contrast to the other locations which were dominated by Taita
- Perhaps related to this, while the number of persons per household varied from 1 to 28 in 2013, MacKinnon Road was still different from others with a mean of 13 compared to 5-8 for the rest
- There was a considerable improvement in reported academic levels with only 2% (compared to 11% in 2012) of the households reporting no member with formal education

Sources of Livelihood Security

- While on-farm production remained consistent with 2012, it is worth mentioning that 59% of the households in 2013 survey also produced fuelwood mainly for household or used on farm
- 2013 survey showed an increase in the number of households obtaining livelihood-supporting products mainly fuel and food types outside their farms and also those visiting project ranches

Cash income to household

- Fewer households reported that they had no sources of cash income in the preceding 12 months compared to the 2012-survey (3% Vs 14%)

Crop, Farm Animals/Fish, Tree and Soil & Land Management Changes

- Both surveys revealed that the most important crops across the six locations over the last 10yrs as well as currently are maize, greengrams and cowpeas, while the most important livestock were chicken, goats and cattle
- The 2013 survey indicated that more households made changes in the way they kept their farm animals and introduced more animal management practices than in 2012.

Soil, Land & Water management

- More households in 2013 reported changes in the way they did their soil, land and water management practices compared to 2012

Food Security

- While the 2012 survey revealed that most households were food secure between October and April, this shrunk to between December and April in the 2013 survey. However, in both surveys, about a third of the respondents said they suffered from food shortage year-round, while about a fifth did not have this shortage at any time of year in 2012 compared to 11% in 2013

Water use: Household and Agricultural

- 2013 survey indicated an increase in the number of households harvesting rain water, usage of boreholes and dams as well as Mt. Kasigau (communal water points) but a slight decline in the number of respondents having access to tap water.

Access to land

- 2013 survey indicated a slight increase in households that lived on communal land, had food crops on their land, and had trees on their farms

Current in-farm land-use

- The number of households that did not plant or protect any trees on their farms in the 12 months preceding the study dropped from about 67% to 47% between the two surveys
- 2013 showed an increase in number of trees protected and types of species planted. Wildlife Works still contributed the majority of seedlings planted by farmers, although other sources came into play in 2013
- Also of importance was the increased number of respondents who grazed their livestock outside their own farms mostly from MacKinnon Road, Kasigau and Marungu locations.

Farm inputs, credit and insurance

- 2013 survey revealed that more households were using various farm inputs like certified/improved seeds, pesticides/herbicides and veterinary medicines compared to 2012 suggesting an advancement in farming practices.

Weather and Markets Information

- Weather related information was received by majority of respondents from increasingly varied sources as reported in 2013 survey compared to 2012. Information sources in 2013 included own observations, radio, friends, relatives or neighbours and traditional forecaster or indigenous knowledge and TV among others
- Both gender had equal access to weather or market-related information either jointly or singly in 2013 while in 2012 men had more access

Governance

- In 2013, there was a very marginal increase in participation in decision-making processes at village and/or locational levels, as well as community groups membership
- Although Mwachabo and Mwatate households remained least represented, most respondents belonged to community groups undertaking various communal activities.

School fees and sources

- More students were reported to be attending various levels of education in 2013 survey compared to 2012: A quarter of the primary school students were not in school due to fees, increasing to more than 50% at secondary and tertiary levels in 2012 surveys while only 9% of the primary school students, 23% at secondary and 37% at tertiary levels were not in school due to fees as indicated by 2013 survey.
- There was a remarkable increase in the number of households that received assistance in paying schools fees and sources of assistance as indicated by 2013 survey: 25 households were helped by four different players in 2013 compared to only two that were assisted by two sources in 2012. While Wildlife Works was not mentioned in 2012, it assisted 8 of the 25 (32%) households that received school fees help in 2013 survey.

Assets & Utilities

- Although asset ownership remained relatively constant between the surveys, mobile phone, radio and bicycles gained prominence in 2013 compared to 2012
- Similarly, the 2013 survey indicated a slight improvement in terms of assets and utilities ownership. Specifically, 2012 survey suggested improved housing as most prominent only in Mwatate while the following year survey also included Kasigau, Marungu and Mwachabo although Mwatate was still dominating.

Infrastructure and Services

- Both surveys revealed most households had to walk 2-3 times further for secondary school compared to primary school; distances to health facilities, shopping centres or market, and usual water points also remained similar in both surveys

Income and Expenditure

- The 2013 survey results suggested a slight increase on income levels especially those who earned between Ksh1500 and 5000 per month and between Ksh10000 and 20000
- Both surveys agreed that in bad years, about a half drop to below the region's poverty line of about Ksh1500 and another a third manage Ksh1500-5000
- Although with marginal differences in proportion, most of the households' income was derived

from farming (both crop production livestock)

- The average annual household expenditure for key expenses (water, education and health) increased in 2013 to about KSh39,650 compared to KSh27,000 in 2012

General knowledge about Environment and REDD

- According to the 2013 survey, fewer households thought environment-livelihoods relationship was bad (55% compared to 79% in 2012)
- On REDD, 70% said they had at least heard about it in 2012 increasing to 89% in 2013, but a majority, (80%) in 2012 and (75%) in 2013, of them said it had had no effect to them
- In 2013 survey, 25% (compared to 15% in 2012) stated that it had had an effect especially through provision of education bursaries, improvement of infrastructure (schools), or feared it would affect their access to FTP and NFTPs
- In 2013, 3% of the households had a member employed by Wildlife Works.

While these differences between 2012 and 2013 surveys could represent genuine shifts in the various issues on the ground e.g., from more awareness created and people started benefiting from the project, there could also be additional effects due to different respondents from the same household and ***Different timing of data collection***. Further analyses of the data will help reveal these spurious effects and set stronger baselines for future assessment.

2.3.11.10 Aerial Transect

One aerial transect (180km) was also established traversing most of the Project Area for additional wildlife and threats monitoring. We have been running this aerial transect approximately once every two months since October 2012 from a gyrocopter flown at an average height of 400ft (c120m) from the ground at 80mph (c130kph) air-speed. Besides monitoring wildlife, other incidences such as livestock, charcoaling activities and poaching (carcasses) are recorded too.



Ten transect-runs have been done between October 2012 and April 2014: two each in 2012 and 2014, and six in 2013. 412 groups/individuals representing 26 different species have been encountered in the 10 transect runs (Figure 53). Besides elephants (82 encounters) and grevy's zebra (3 encounters), other highlights include a solitary wild dog, white-backed and white-headed vultures and secretary birds. Given only two sessions were conducted at end of 2012 and only two are included for 2014 against the six for 2013, it is difficult to make conclusions about these trends in encounter rates (and associated numbers) yet.

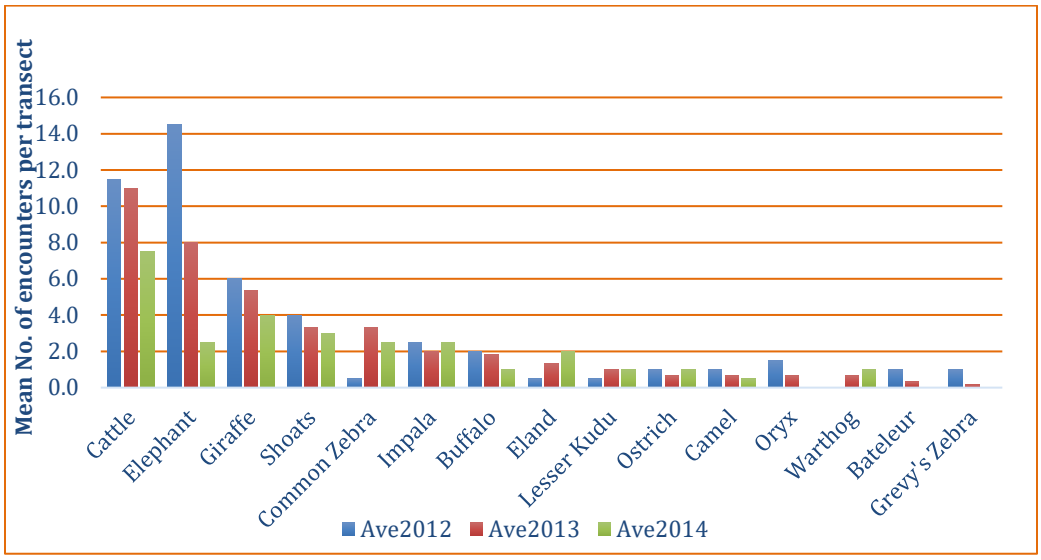


Figure 53**:** Mean number of encounters of the top 15 most common species (including livestock) during aerial transect counts between 2012 and 2014

2.3.11.11 Charcoal and Firewood Monitoring

Since February 2012, we have been conducting monthly (with a few exceptions) counts of the amount of charcoal and firewood stacks that can be seen along the Nairobi-Mombasa Highway along the section that touches our Project Area i.e., from Voi town to McKinnon Road town, a distance of about 63km. Over 24 sampling sessions so far between Feb 2012-Oct 2014, a total of 1,127 incidents have been recorded, mostly being charcoal bags (618) and firewood stacks (464) but also a growing number of active charcoal kilns (45). Although incident figures suggest a declining trend (Figure 54), absolute numbers suggest an upward trend alongside the new activity of making charcoal along the roadside (Figure 55).

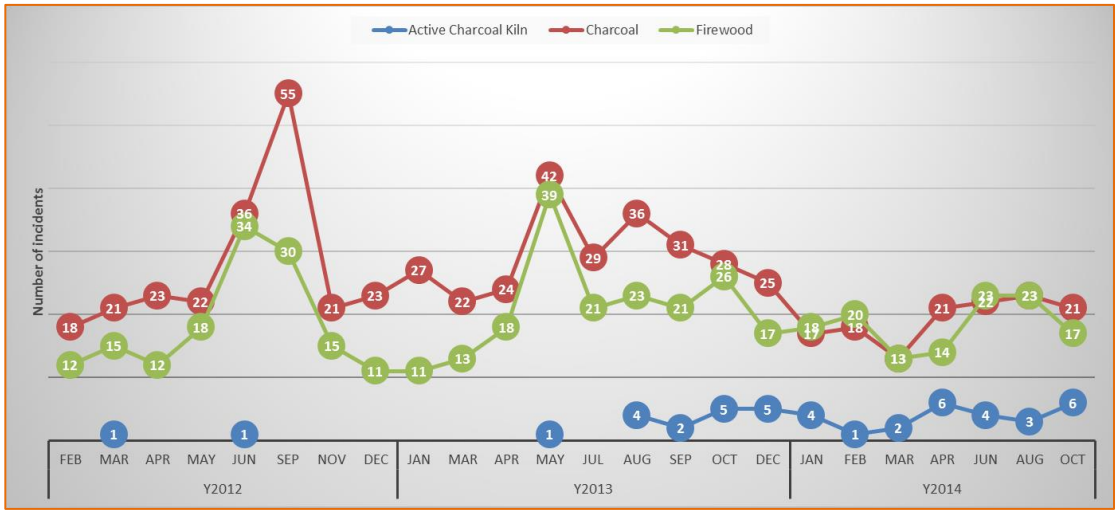


Figure 54: Incidence of charcoal bags, firewood stacks and active charcoal kilns along the Nairobi-Mombasa Highway between Voi and McKinnon Road from 2012-2014

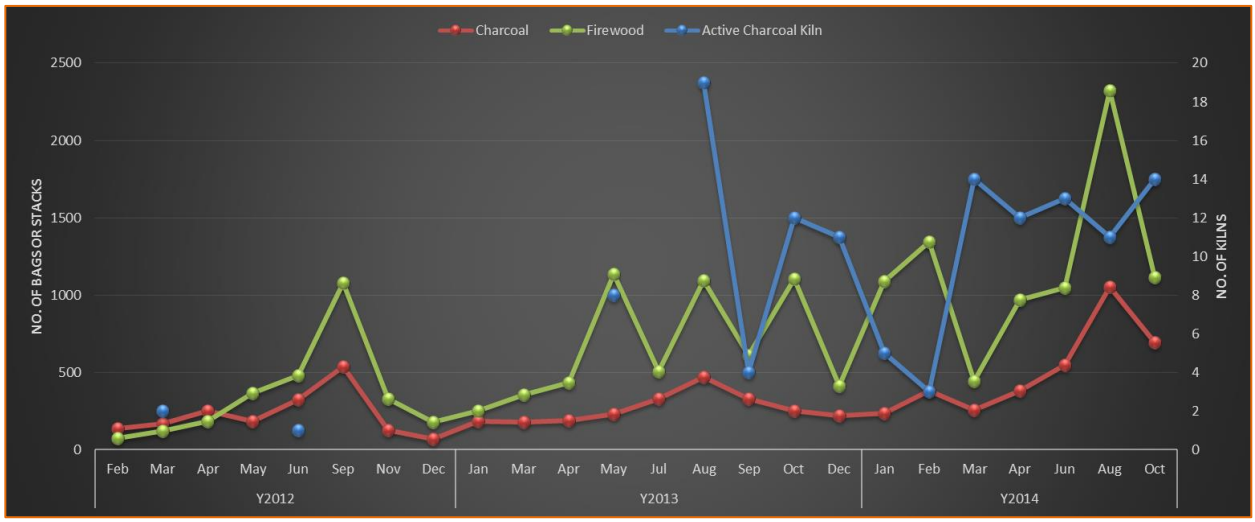


Figure 55: Absolute number of charcoal bags, firewood stacks and active charcoal kilns counted along the Nairobi-Mombasa Highway between Voi and McKinnon Road from 2012-2014

2.3.11.12 Charcoal Traders Survey

In 2012, we 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.

The outcomes of this survey were discussed with the six LCCs during the annual Social and Biodiversity Monitoring meeting. Further surveys are planned in the future.

2.3.11.13 Amara Radio Survey

Over the years Wildlife Works was worked in conjunction with the Amara Conservation Group, a

local NGO that specializes in environmental education and awareness. Their main way of outreach is through film showings and engaging communities in barazas. The Amara staff often accompanies the Wildlife Works Community Outreach Team, as their deliverables complement each other and therefore they achieve a better overall outcome.

In 2012, Wildlife Works assisted Amara Conservation in a short radio listening survey, 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.

2.3.12 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.

2.3.13 REDD Carbon Inventory Monitoring

As per VM0009 and the VCS Project Description (PD), 20% of the 429 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.

2.3.14 Group Ranch Office Renovations / Construction

There were additional improvements were made to the Rukinga Sanctuary carbon office and staff facilities. Though these offices and facilities are on the Kasigau Phase I Project Area, they are the central base from which all Project Activities are coordinated. 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. In addition, the workshop was expanded, to incorporate a bigger space for carpentry and welding work.

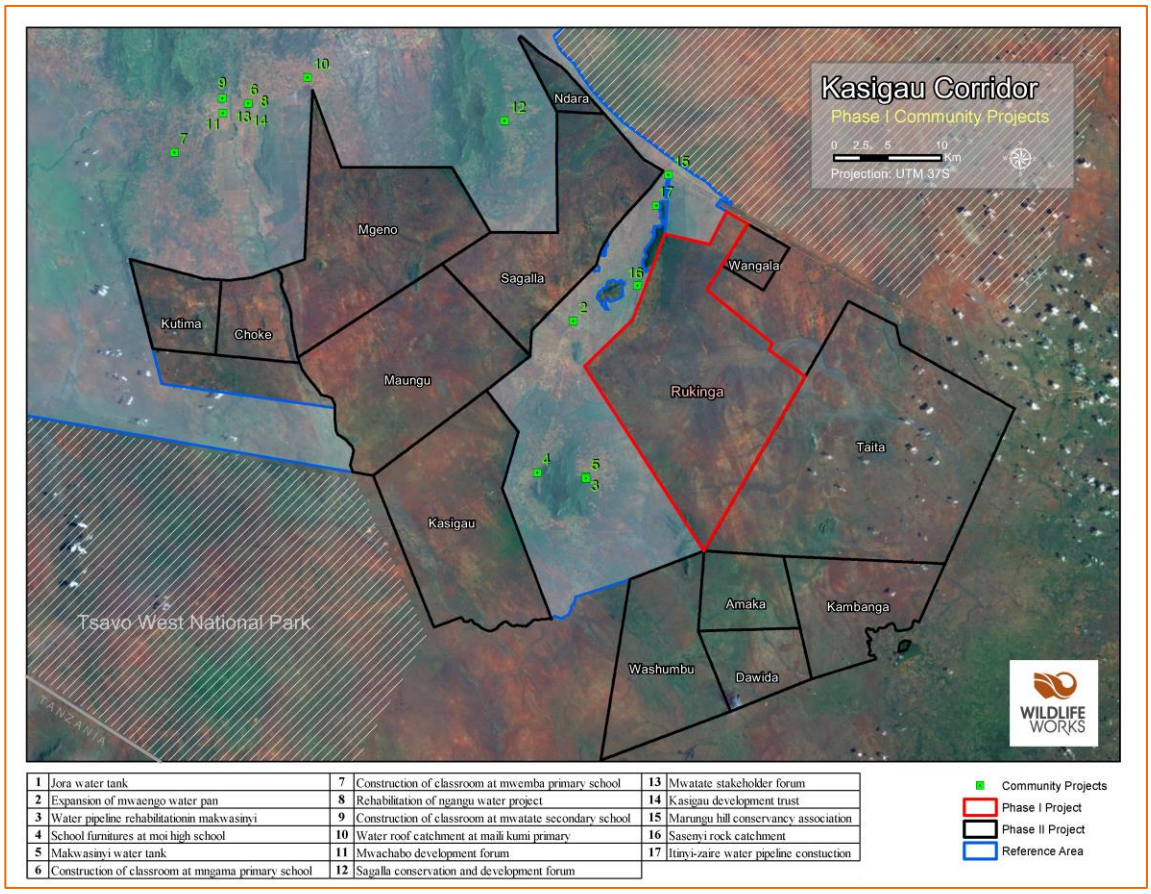
2.3.15 Project Activity achievement of expected community and biodiversity impacts (G3.2)

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_4: January 1st, 2013 to December 31st, 2014. 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 Activities that have been implemented under this Project and that were active during this monitoring period, M_4: January 1, 2013 through December 31, 2014:



1	Jora water tank	7	Construction of classroom at mwemba primary school	13	Mwatate stakeholder forum
2	Expansion of mwaengo water pan	8	Rehabilitation of ngangu water project	14	Kasigau development trust
3	Water pipeline rehabilitationn makwasinyi	9	Construction of classroom at mwatate secondary school	15	Marungu hill conservancy association
4	School furnitures at moi high school	10	Water roof catchment at maili kumi primary	16	Sasenyi rock catchment
5	Makwasinyi water tank	11	Mwachabo development forum	17	Itinyi-zaire water pipeline constuction
6	Construction of classroom at mngama primary school	12	Sagalla conservation and development forum		

Figure 56: Major Project Activities commenced in the current verification period

2.4 Management of Risks to Project Benefits (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+ Project Phase I 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.

2.5 Measures to Maintain High Conservation Values (G3.6)

The Kasigau Corridor REDD+ Project Phase I 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 Corridor REDD+ Project Phase I 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.



Figure 57: 7,000 tree seedlings were planted in the pictured boma on Rukinga ranch around the Mwakaramba Tank

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). Over the last monitoring period, a further 2 dams were scooped, and one is currently in the making. 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 is closely being 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 ivory trade and the dangers facing those assigned to protect them. It was shot on location in Rukinga Ranch, and in September 2014 an additional film crew returned to re-shoot a few scenes in order to expand the shows TV viewership's' geographic scope . The documentary was finally completed in November 2014 and aired in a number of countries, including the USA, Netherlands, UK, Belgium and Germany. 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). Over 2013 and 2014, this compound was expanded to house a campsite and extra accommodation for visiting researchers. These renovations are planned to be completed in 2015. 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).

2.6 Project Financing (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.

2.7 Employment Opportunities and Worker Safety (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.

2.8 Stakeholders (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 beginning in the second week of December 2014, until mid-January, 2015). 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 8:00 am to 5:00 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 clarification request (CL2) in verification of the M2 monitoring period under the CCB standard. The following text was added to the grievance policy in response to the clarification request, satisfying the VVB and resulting in the closing of the CL:

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.

Suggestion boxes were introduced in 2012 as an additional avenue for providing feedback and grievances apart from Wildlife Works' open-door policy and community meetings. In 2012, no suggestions were provided, but 16 and 43 comments were collected in 2013 and 2014 (the M_4 monitoring period), respectively. Most were opinions, but there were a number of negative comments (grievances) as well (Figure 58). For the negative remarks especially, a meeting was held with the team(s) that the grievance was directed at and action was taken accordingly. Where a response was desired and contact details provided, the aggrieved party was contacted directly.

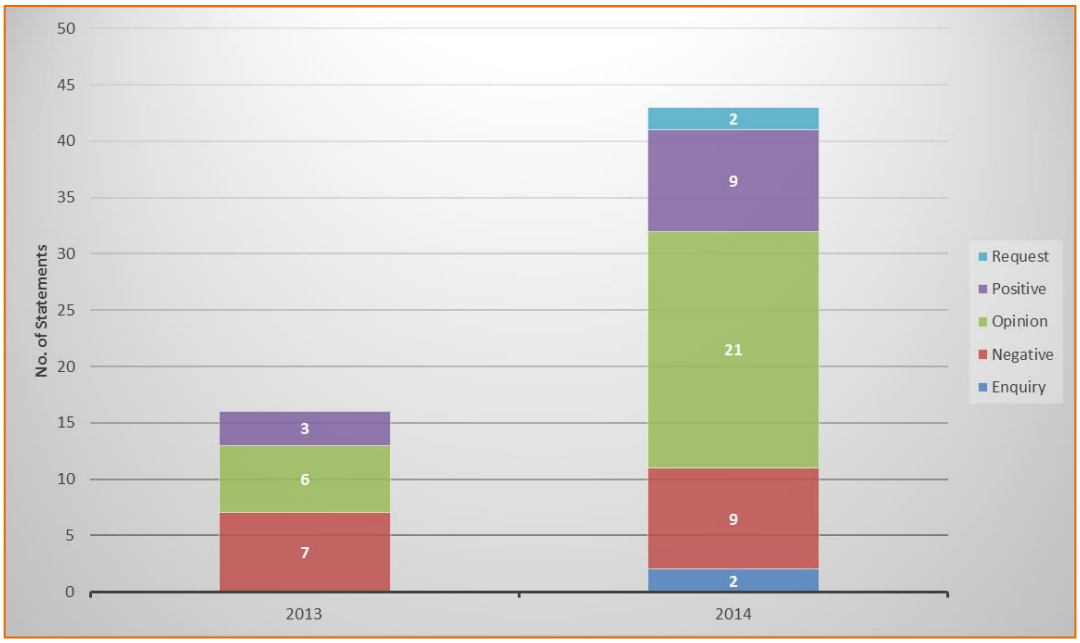


Figure 58: Categories of remarks collected from Suggestion Boxes across the six locations within the REDD+ project zone from 2012-2014

3 LEGAL STATUS

3.1 Compliance with Laws, Statues, Property Rights and Other Regulatory Frameworks (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 USA.

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 (G5.6)

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 (CL1.5)

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 (CL1.5)

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary 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 (CL1.5)

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary 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 (CL1.5)

The Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary 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 (G5.3-4)

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 (G5.5)

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

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

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

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.

M_4 Deviations

There were no deviations in this monitoring period.

4.3 Project Boundary (G1)

Kasigau Corridor REDD+ Project 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.

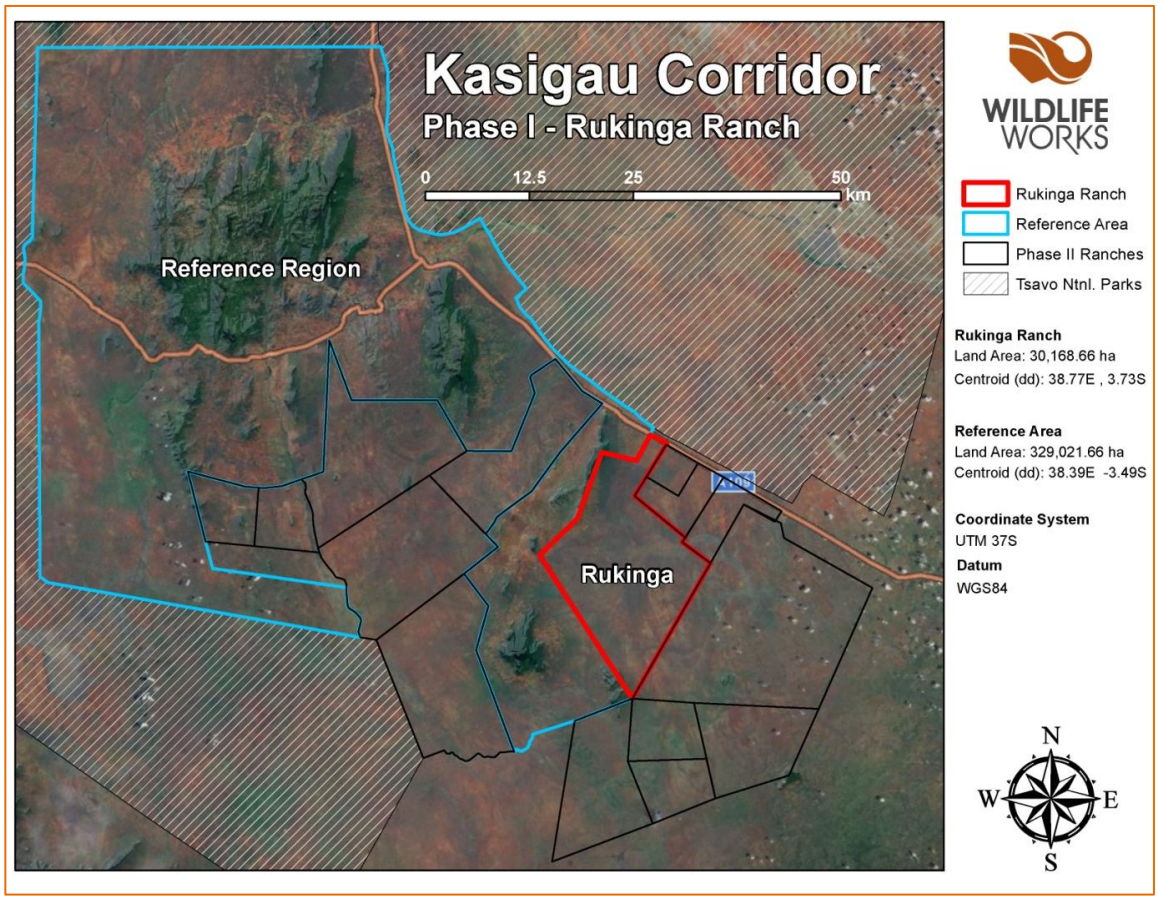


Figure 59: Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary and Reference Region Spatial Boundaries.

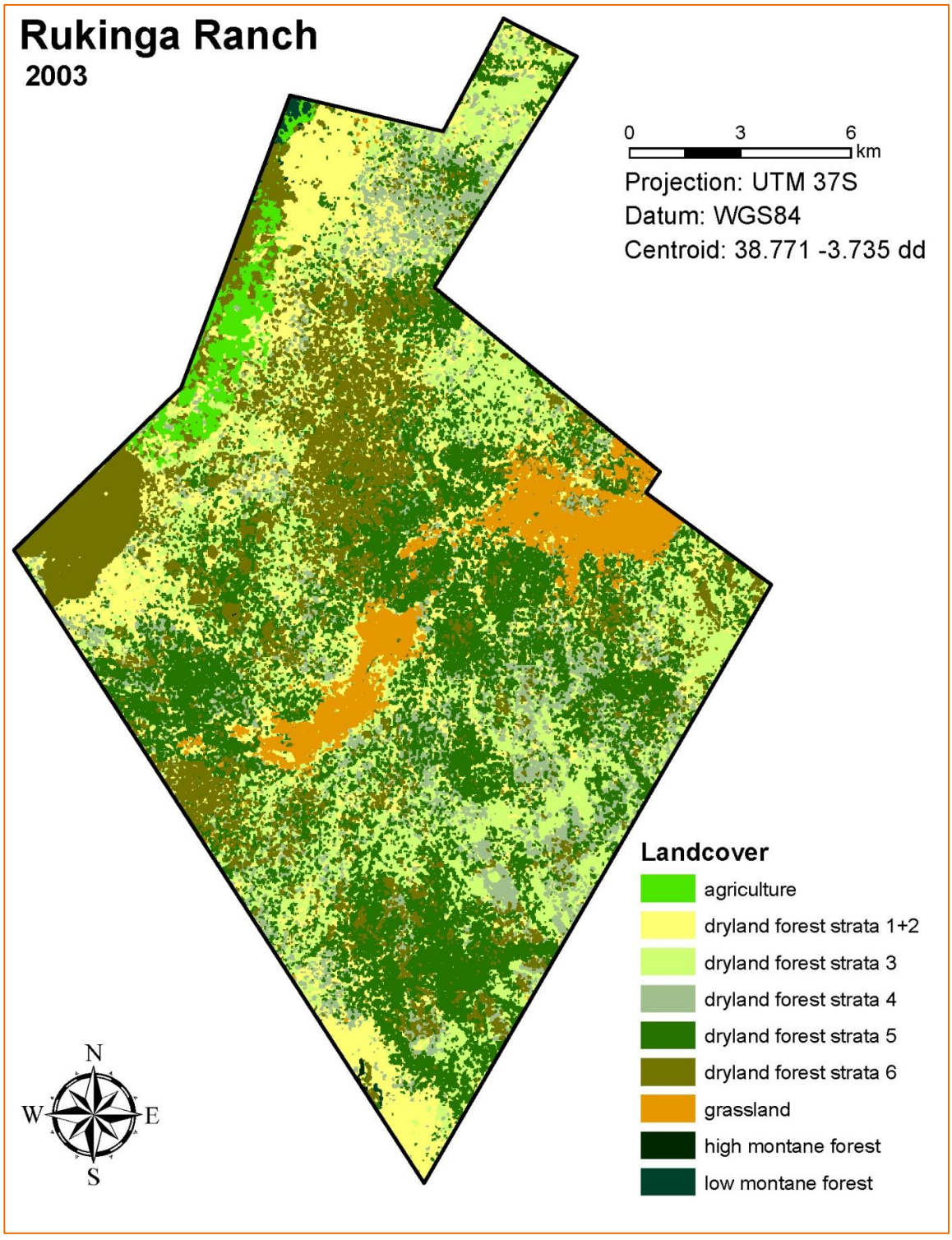


Figure 60: Kasigau Corridor REDD+ Project Phase I – Rukinga Sanctuary landcover Map, Classified from Landsat 7 ETM+ Acquired February , 2003

The following table shows the landcover strata for Kasigau Corridor REDD+ Project Phase I and their respective areas. Strata sum to the total area for the Ranch, 30,168.66 ha.

Table 6: Landcover Strata area included in the Kasigau Corridor REDD+ Project 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 and VCS PD Section 5.1.

Table 7: Major carbon pools included in the Kasigau Corridor REDD+ Project Phase I 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 (BGNT)	CO_2	**X**	Major Project Carbon Pool Included
		CH_4		De minimis
		N_2O		De minimis
		Other		**De minimis**

4.4 Baseline Scenario (G2.1 & G2.4-5)

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.



Figure 61: Non-Sustainable Charcoal Kiln used to create “bush-charcoal”



Figure 62: Typical deforested area in the Kasigau Corridor REDD+ Project Phase I 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 (G2.2)

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.

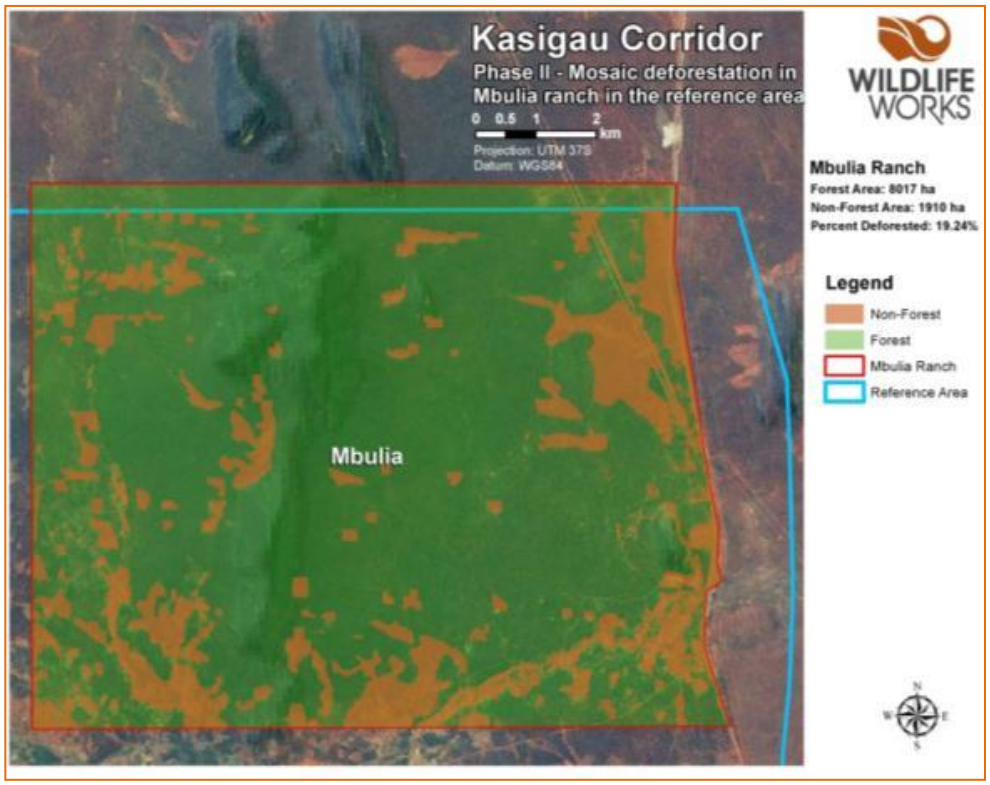


Figure 63: Mbulia Ranch in the Kasigau Corridor REDD+ Project Phase I Reference Area

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 REDD+ Project Phase I 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 REDD+ Project Phase I – Rukinga Sanctuary is additional under the rules of VT0001 Tool for the Demonstration of Additionality in VCS AFOLU Project Activities.

4.5.1 justification that community and biodiversity benefits would not have occurred in the absence of the project (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.

5 MONITORING DATA AND PARAMETERS

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

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, which are all excluded from the carbon accounting. Overall, the 9 strata sum to the total project land area, depicting the Project Area's overall landcover as shown in Figure 63 below.

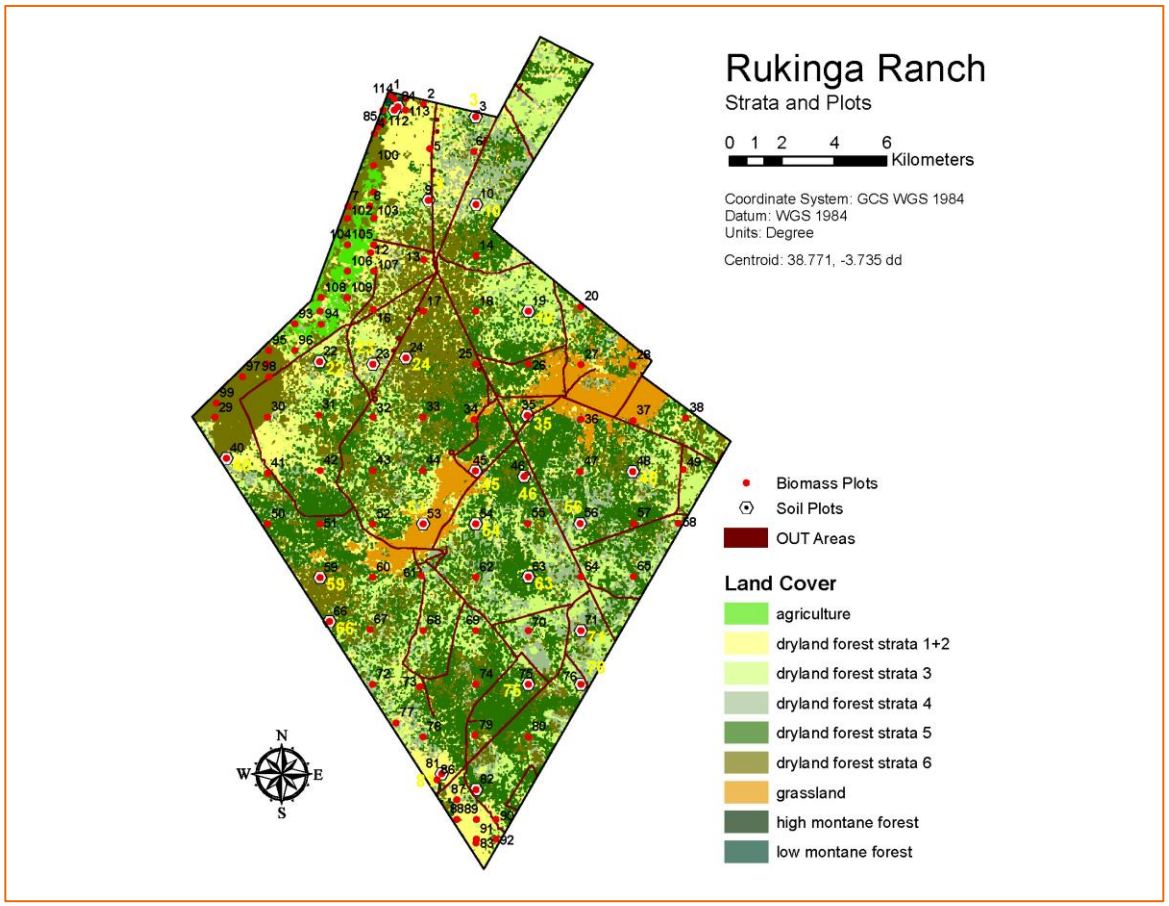


Figure 63: The Kasigau Corridor REDD+ Project Phase I – The Rukinga Sanctuary landcover strata and biomass and soil plot locations.

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 unnecessary 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 monitoring period. For this monitoring period (m_4), 22 plots were measured across the Rukinga Sanctuary.

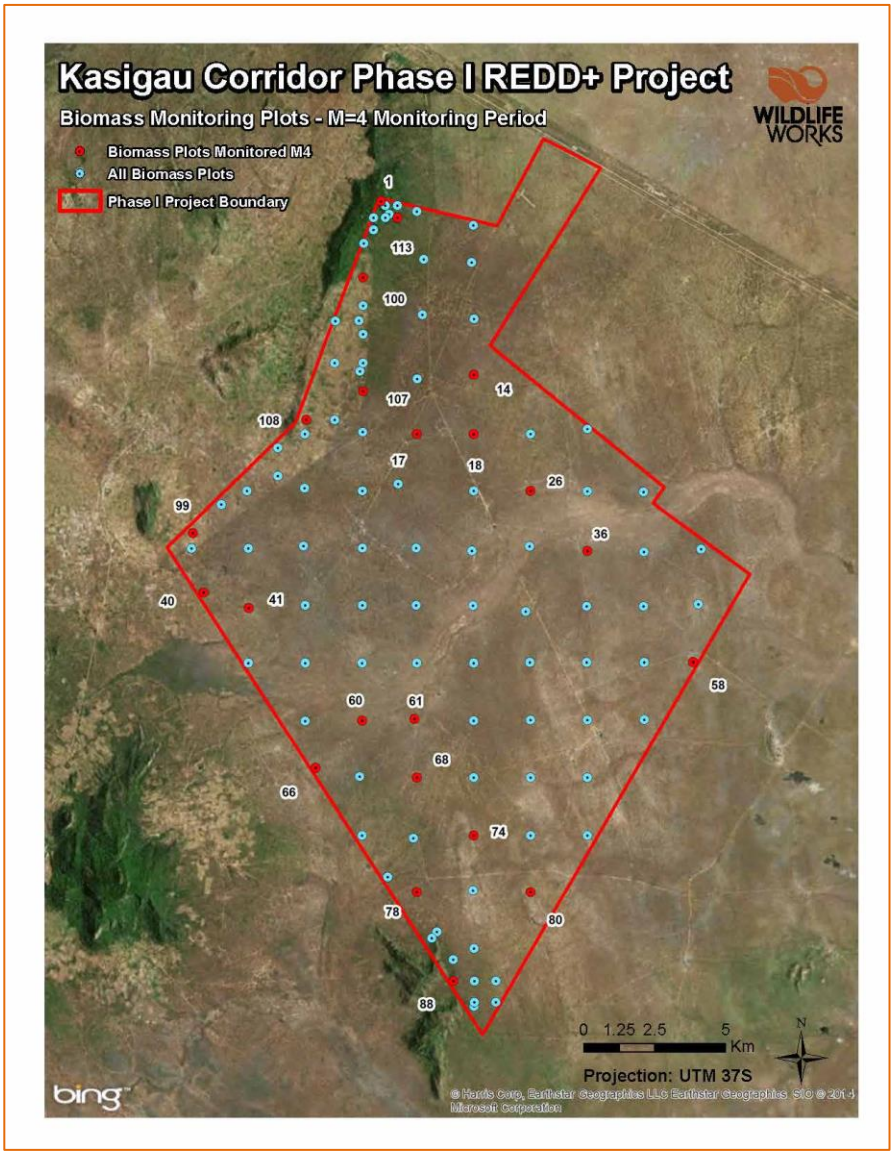


Figure 64: Biomass plots for M_4 – 20% of the 115 permanent plots are measured every monitoring period

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.

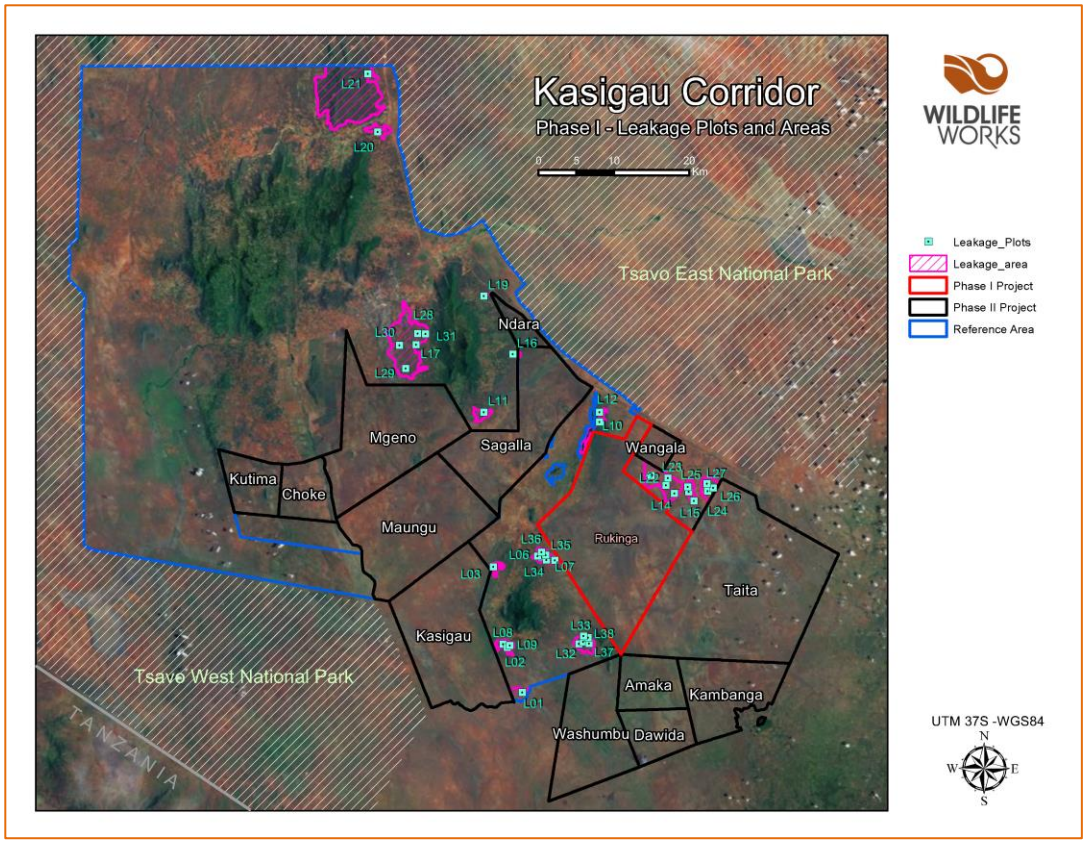


Figure 65: Leakage plot locations for Kasigau Corridor REDD+ Project Phase I.

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.

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:*

Table 8: The Carbon Pools that are included in the Kasigau Corridor REDD+ Project Phase I

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 of the Reference Area 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 a 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 (CL3.1)

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 $[\mathrm{m}]$.
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)

The following data and parameters were monitored during this period (m_4) 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.

5.3.1 Climate data and parameters monitored (CL3)

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 at each monitoring event, 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=4_v2.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 area 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: ($kg \cdot kg^{-1}$; 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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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=4_v2.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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	The file 'Rukinga Carbon Model and NERs_M=4_v2.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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	0 The 'Rukinga Carbon Model and NERs_M=4_v2.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 procedures to be applied:	N/A.
Frequency of monitoring/recording:	20% of biomass plots are measured at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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 $CO_2e \bullet ha^{-1}$
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 at each monitoring event, so that 100% of plots are measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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 $CO_2e \bullet ha^{-1}$
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 at each monitoring event, so that 100% of plots are

	measured once every five years.
Value monitored:	Please see the file 'Rukinga Carbon Model and NERs_M=4_v2.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:	1,519,124.18
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:	216,890.1
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:	607,649.67
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:	86,456.04
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:	47.546.73
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	N/A. This variable is not monitored as there is no

procedures to be applied:	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:	0.4316
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:	0.744
Monitoring equipment:	N/A.
QA/QC procedures to be applied:	N/A.
Calculation method:	Calculated from a model, see Equation 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:	

Data Unit / Parameter:	$N_{P,k}$
Data unit:	Count
Description:	Total number of possible plots in stratum k.

<table>
<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>

5.3.2 Community and Biodiversity Metrics (CL3.1 & B3.1)

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).

5.3.2.1 Social Impact Assessment

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.

Wildlife Works Project Employment

There has been a steady growth in the number of employees at Wildlife Works under the Kasigau Corridor REDD+ Project, currently with over 300 employed on permanent basis; most of these are local (Figure 66). Casuals were common during the expanding phase of the company but have been largely discontinued since April 2013. While rangers and seamstresses at the eco-factory make up a bulk of the workforce, other core sections are increasingly better staffed (Figure 67).



Figure 66: Changes in number of employees under permanent and casual status between 2010 and 2014 at the Kasigau Corridor REDD+ Project

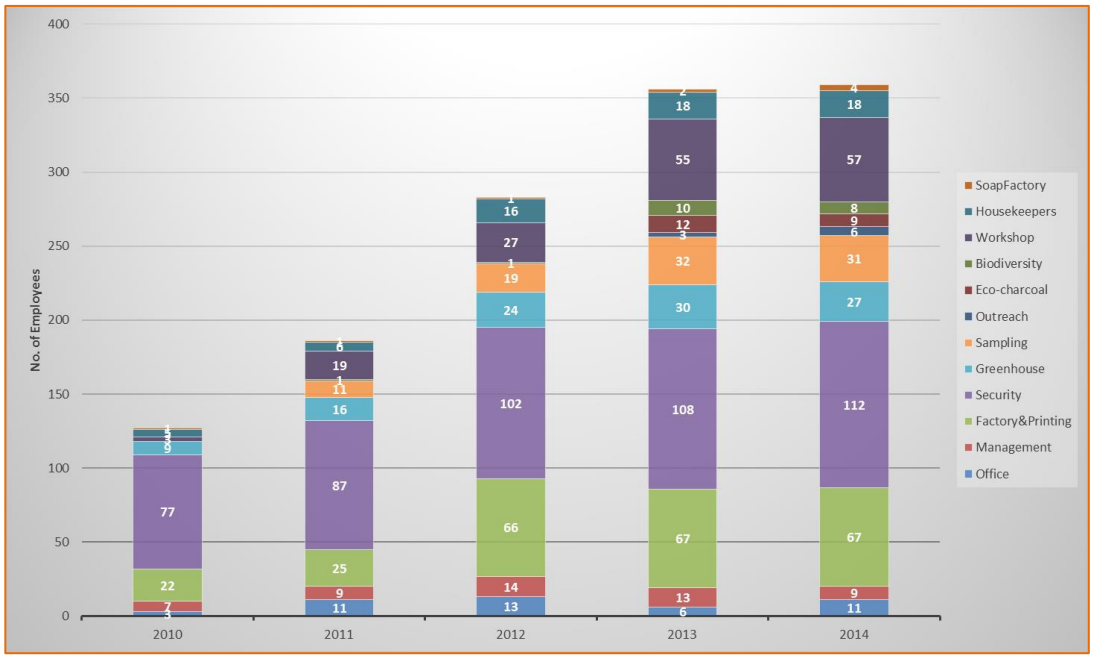


Figure 67: Breakdown of employees by the core functions at the Kasigau Corridor REDD+ Project

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

Table 9: Number of full time employees

Year	Wildlife Works employees
2010	8
2011	15
2012	23
2013	30
2014	27

Indicator – Local Employment

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

Table 10: Number of locals employed full time by the Project

Year	Number employed from Project Area	Number employed from outside Project Area
2010	8	0
2011	15	0
2012	23	0
2013	**30**	**0**
2014	**27**	**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.

Table 11: Kasigau Corridor REDD+ Project Financial Investment and Return

Monies invested in capital expense	
Year	**KSH**
2010	0
2011	566,000
2012	140,120
2013	**818,976**
2014	**686,280**

Annual operating costs	
Year	**KSH**
2010	756,491
2011	547,400
2012	3,025,805.50
2013	**5,027,044**
2014	**4,573,136**

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.

Over the last monitoring period, the vegetable production has been increasing steadily and enabled a significant volume to be sold. In 2013, the greenhouse sold Ksh 40,520 (US $474) worth of vegetables to staff and local community members, whilst this increased to Ksh 92,940 (US $1,080) in 2014.

Table 12: The number of greenhouse locations developed under the Kasigau Corridor REDD+ Project.

Year	Wildlife Works	Amiran
2010	3	0
2011	0	0
2012	0	2
2013	**0**	**0**
2014	**0**	**0**

Table 13: 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	33,758	12,423	21,335	37
December 2012	11,238	11,125	113	35

Table 14: Type of species and quantities sold at the Wildlife Works' selling point.

Species	units sold 2013	units sold 2014	price per unit	Total Ksh per species
passion	147	0	150	22050
washington navel	154	504	150	98700
grape mash	30	75	150	15750

clementine	47	86	150	19950
pixie	191	808	150	149850
apple mango	302	502	150	120600
miniola	315	1611	150	288900
ngowe	167	316	150	72450
valencia late	68	262	150	49500
melia	393	113	100	50600
guaver	8	10	50	900
tangerine	68	284	150	52800
calia flower	12	40	50	2600
local passion	55	37	50	4600
neem tree	8	1	20	180
magidea	41	23	50	3200
indinous species	180	0		0
rootstock mango	11	125	50	6800
lime	214	159	50	18650
thichilium africanam	1	0	50	50
amarula	24	4	80	2240
jojoba	103	8	50	5550
robusta	37	1	50	1900
gliricidia	4	5	50	450
tortilis	50	0	50	2500
umbrella	12	22	50	1700
commifera	10	0	50	500
prunoids	10	1	50	550
brownii	40	0	50	2000
newtonia	20	0	50	1000
delonix	60	0	50	3000
moringa	8	0	50	400
solo sunrise	12	0	50	600
bamba coffee	4	7	50	550
rootstock lemon	10	159	50	8450
chrismas tree	3	0	50	150
ziziphus	40	0	50	2000
abbriviatta	42	0	50	2100
tahit	4	200	150	30600
maya	6	114	150	18000
mkalamu	4	4	50	400
lannea	12	0	50	600
borgan villa	1	0	50	50
egyptica	20	0	50	1000
spinosa	2	0	50	100
baobab	0	2	50	100

avacoda	0	6	50	300
crotton	0	1	50	50
ashoc	0	24	100	2400
unknown fruits	0	217	150	32550
custurd apple	0	1	50	50
jathorofa trrofers	0	2	50	100
TOTAL	**2950**	**5734**		KES 1,100,070.00

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%**:

Table 14: The percent of Indigionious tree seedling survival at each planting location.

Schools/Communal area	2011	2012	distributed 2013	surviving from 2013	percentage 2013
Mkamenyi pri	530	620	650	384	59%
Marungu sec		24	100	56	56%
Mbela pri		103	400	235	59%
Mwambiti sec		28	200	63	32%
Rukanga pri	19	101	150	0	0%
Bungule pri		141	500	201	40%
Msharinyi pri	56	109	100	67	67%
Miasenyi Pri		97	200	119	60%
Ngambenyi pri		63	200	137	69%
Kiteghe pri	39	82	200	87	44%
Jorah pri		165	250	192	77%
Jaffery pri		21	200	44	22%
Mackinon sec		96	100	265	265%
White house children's home		2	0		-
Kismenyi pri	326	448	600	413	69%
Buguta pri	167	156	600	158	26%
Buguta sec	53	41	500	272	54%
Kasigau girls		3	500	67	13%
G.Mosi pri	256	56	200	71	36%

Kajire girls		31	1000	461	46%
Talent school			500	18	4%
Mwambiti poly		73	200	87	44%
Sowa pri		27	500	286	57%
Itinyi pri	195	109	300	79	26%
Marungu pri	112	141	500	103	21%
Kale pri	215	92	650	328	50%
Mwakaramba		2240	0	0	-
Tumaini C.B.O			2000	1403	70%
Marasi pri			0	0	-
Klever pri		18	500	183	37%
Mwambiti pri		180	200	106	53%
Sasenyi pri		56	350	80	23%
St. Joseph	43	72	300	58	19%
Total:	**2011**	**5395**	**12650**	**6023**	**50%**

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:

Table 15: The total number of seeds planted at each planting site type.

Project Site	2010	2011	2012	2013	2014	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.

Table 16: The employment and financial return of the Wildlife Works Jojoba project

Number of full time employees	
Year	WW employee
2010	
2011	1
2012	1
2013	**1**
2014	**1**

Local employment		
Year	Number employed from Project Area	Number employed from outside Project Area
2010		
2011	1	0
2012	1	0
2013	**1**	**0**
2014	**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
2013	0
2014	194,162

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**
2013	**315,680**
2014	**315,680**

Income generated from Jojoba project since the REDD Project began, 1st Jan, 2010.	
	KSH
2010	8,000
2011	8,000
2012	8,000
2013	**0**
2014	**11,568**

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

Table 17: The number of individuals in full time employment at the Wildlife Works EcoFactory

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
2013	**62**	**7**	**68**	**1**
2014	**60**	**7**	**66**	**1**

Financial investment into EcoFactory				
Year	CAPEX USD	Operating costs	Returns USD	Profit USD

		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	
2013	270,556	32,567,426	9,471,782	
2014	3,010	21,384,846	8,083,398	

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		
2013	**6,450**	**4,741,782**	**2,617,410**	
2014	**31,992**	**5,289,688**	**5,421,612**	**131,924**

Local Kenyan Sales from Factory	
Year	USD
2005	500
2006	1,700
2007	3,000
2008	5,000
2009	6,000
2010	200
2011	0
2012	**0**
2013	**0**
2014	**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?

Table 18: Number of full time employees in Eco tourism projects, and number employed from the Project Area.

Year	WWC Employee	Total included in-community (Camp Kenya)
2010		
2011		
2012	0	9
2013	**0**	**9**

2014	**0**	**0**

Year	Number employed from Project Area	Number employed from outside Project Area
2010		
2011		
2012	6	3
2013	**6**	**3**
2014	**0**	**0**

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

Table 19: The number of school 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
2013	Kelimu	0	0	0	0	0	0	0	0

	Trust								
	WWCT Bursary Scheme	613	3,454,740	189	659,240	66	640,000	868	4,753,980
	CDF	2,101	4,172,000	261	261,000	439	1,843,800	2801	6,276,800
	Equity Bank	80	4,000,000	0	0	2	80,000	82	4,080,000
2014	Kelimu Trust	0	0	0	0	0	0	0	0
	WWCT Bursary Scheme	456	1,440,000	70	637,578,000	70	808,850	596	2,886,428
	CDF	2,242	6,376,000	0	0	416	2,496,000	2658	8,872,000
	Equity Bank	60	3,600,000	0	0	2	80,000	62	3,680,000

Wildlife Works Bursary Scheme (WWCT)

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

Table 20: The number of students supported by the Wildlife Works Bursary Scheme are shown by grade level and 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 2012	**132**	**291**	**1,184**	**1,607**
2013	Marungu	0	0	0	**0**
	Sagalla	29	136	380	**545**
	Mwachabo	6	2	2	**11**
	Mwatate	34	51	225	**310**
	Kasigau	0	1	2	**3**
	Mackinnon Road	0	0	0	**0**
	Total 2013	**66**	**189**	**613**	**868**
2014	Marungu	6	13	0	19
	Sagalla	15	8	0	23
	Mwachabo	3	2	0	5

	Mwatate	10	12	0	22
	Kasigau	26	17	285	328
	Mackinnon Road	15	13	171	199
	Total 2014	**75**	**65**	**171**	**199**
	Total	**273**	**545**	**2,253**	**3,017**

Wildlife Works Carbon Trust Bursary Scheme (WWCT)

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

Table 21: The total amount funded by the Wildlife Works Bursary Scheme are shown by grade level and location

Year	Location	Total Amount University (KSH)	Total Amount Tertiary (KSH)	Total Amount Secondary (KSH)	Total by Location (KSH)
2012	Marungu	156,000	165,000	2,048,560	2,369,560
	Sagalla	480,000	604,000	1,343,000	2,427,000
	Mwachabo	416,000	328,000	1,233,000	1,977,000
	Mwatate	320,000	298,000	1,480,000	2,098,000
	Kasigau	180,000	292,000	1,512,000	1,984,000
	2012 Total	**1,552,000**	**1,687,000**	**7,616,560**	**10,855,560**
2013	Marungu	**0**	**0**	**0**	**0**
	Sagalla	**290,000**	**205,900**	**1,900,000**	**2,395,900**
	Mwachabo	**40,000**	**81,000**	**263,779**	**384,779**
	Mwatate	**310,000**	**336,000**	**1,209,000**	**1,855,000**
	Kasigau	**0**	**36,340**	**81,961**	**118,301**
	Mackinnon Road	**0**	**0**	**0**	
	2013 Total	**640,000**	**659,240**	**3,454,740**	**4,753,980**
2014	Marungu	**112,000**	**177,000**	**0**	**289,000**
	Sagalla	**125,000**	**150,000**	**0**	**275,000**
	Mwachabo	**53,350**	**54,578**	**0**	**107,928**
	Mwatate	**212,000**	**145,000**	**0**	**357,000**
	Kasigau	**186,500**	**52,000**	**900,000**	**1,138,500**
	Mackinnon Road	**120,000**	**59,000**	**540,000**	**719,000**
	2014 Total	**808,850**	**637,578**	**1,440,000**	**2,886,428**

2. School Construction and Maintenance

Table 22: 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			
Kasigau	Kisimenyi Water Dam	Dam Scooping	Dam Scooping	Completed	893,000	667,400	Community can now access water for their domestic use and also livestock
Mwachabo	Mngama PS	Building	Classroom construction	Completed	759,000	645,150	Reduced congestion of classes
Mwachabo	Mwemba PS	Building	Classroom and Office	Completed	1,682,015	1,429,713	Reduced distance to get to school
Sagalla	Talio Youth Poly	Building	Classroom construction	On-hold			
Sagalla	Marie Pri Sch	Building	Construction of staff houses	On-hold			
Sagalla	Mwambiti Pri Sch	Building	Classroom construction	Completed	918,311	918,311	Reduced congesti

							on of classes
Sagalla	Mchang'a Nursery	Building	Classroom construction	Completed	918,311	918,311	Reduced congestion of classes
Sagalla	Kileva Pri Sch	Building	Classroom construction	Completed	918,311	918,311	Reduced congestion of classes
Sagalla	Kajire Sec School	Building	Classroom construction	Completed	918,311	918,311	Reduced congestion of classes
Mwatate	Mwatate Sec Sch	Building	Classroom construction	Completed	800,000	680,000	Better learning condition for students
Mwatate	Mzwanenyi Pri Sch	Building	Classrooms' repair (floor & roofing)	Completed	2,139,758	2,139,758	Better learning condition for students
Mwatate	Mwatunge Pri Sch	Furniture	Making of 100 desks	Completed	414,000	414,000	Better learning condition for students
Mwatate	Kipusi Pri Sch	Furniture	Making of 16 desks	Completed	66,240	66,240	Better learning condition for students
Mwatate	Mwatate Sec Sch	Furniture	Constructing 20 Lockers and 20	Completed	104,000	104,000	Better learning condition for

			Desks				students
Mwatate	Mzwanenyi Sec Sch	Furniture	Constructing 20 Lockers and 20 Desks	Completed	104,000	104,000	Better learning condition for students
Marungu	Marungu Dispensary	Water Harvesting Project	Guttering at Marungu Health Centre	Completed	40,000	37,690	Improved water supply to the health centre
Marungu	Wangalla Pre Sch	Renovation of once classroom at Wangala pre-school and making of 20 Desks	Classroom renovation and 20 desks making	Completed	240,000	293,310	Better learning condition for students
Marungu	Marasi Pri Sch	Classroom Renovation	Renovating four classes	Completed	1,700,800	1,464,838	Students are now studying in a conducive environment
Marungu	Miasenyi Pri Sch	Classroom Renovation	Renovation of three classroom	Completed	215,210	215,210	Students are now studying in a

							conducive environment

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

3. Water Projects

Table 23: The Community water projects supported by the WWCT are shown

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
2013 2014	Kasigau	Jora water Tank	Water	Water tank	Construction of a water tank 100M Cubic	Completed
2013 2014	Kasigau	Makwasinyi Water Tank	Water	Water tank	Construction of a water tank 25M cubic	Completed
2013 2014	Mwachabo	Mngama Water Project	Water	Water Chambers Renovation and pipeline Extension	Renovation of water chambers and piping extension	Completed

2013 2014	Mwachabo	Jombo Water Project	Water	Water Pipeline extension	Fixing a new line and a storage tank	About to start
2014 2014	Marungu	Sasenyi Water Project	Water	Water Harvesting Project	Construction of Sasenyi rock catchment	Completed
2013 2014	Marungu	Marungu Dispensary	Water	Water Harvesting Project	Guttering at Marungu Health Centre	Completed
2013 2014	Mackinnon	Water Pipeline extension	Water	Pipeline extension	Extension of Water Pipeline 6km.	Waiting for Water Engineer Report.

4. Other WWCT Projects

Table 24: Other Projects funded by the WWCT during the current monitoring period (M_4) and the previous monitoring period (M_4)

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
2013 2014	Kasigau	Megoa water dam	Other	Dam Scooping	Dam Scooping	Completed
2013 2014	Kasigau	Kisimenyi Water Dam	Other	Dam Scooping	Dam Scooping	Completed
2013 2014	Sagalla	Kanyanga-Kizumanzi	Other	Road Renovation	Renovation of 6 Km of road	Completed
2013 2014	Mackinnon	Chief Office	Other	Renovation	Renovation of Chief's Office	On-going

Soap Factory

Construction of the soap factory building was completed in April 2013 and operations moved into the building shortly afterwards located close to the Carbon Office. Wildlife Works was employing two local ladies, who were joined by a third lady in 2014. Soap production has since increased and we are now making a large variety of different flavors, including coffee and jojoba, coconut and lime, Moringa and olive oil, myrrh and jojoba, honey and beeswax and beer soap. Per month, average production is approximately 10-15 batches, where 1 batch equals 1kg of soap. This mirrors the current yet we have the capacity to increase production significantly. Soaps are being sold to various shops in the country as well as to local staff.

Indicator - # of full-time Employees
Indicator - # of local employees

Indicator - Financial Investment / Return

Table 25: Total employment and investment in the soap factory by WWCT during the current monitoring period (M_4) and the previous monitoring periods.

Number of full time employees		
Year	WWC employees	Total included in community
2010	1	0
2011	1	0
2012	1	0
2013	**2**	**2**
2014	**3**	**3**

Local employment		
Year	Number employed from Project Area	Number employed from outside Project Area
2010	1	0
2011	1	0
2012	**1**	**0**
2013	**2**	**0**
2014	**3**	**0**

Monies invested in capital expense (CAPEX)	
Year	KSH
2010	0
2011	0
2012	**99,900**
2013	**0**
2014	**0**

Annual operating expenses	
Year	KSH
2010	86,400
2011	115,920
2012	**4,389**
2013	**249,744**

2014	**418,132**

Income generated	
Year	KSH
2010	80,750
2011	46,750
2012	**0**
2013	**135,966**
2014	**217,322**

5.3.2.2 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_4). 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, covered an area of 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.

Table 26: The overall Project incidents are shown for each monitoring period.

Incidence	2010	2011	2012	2013	2014	Grand Total
Armed contact	1	0	0	1	1	3
Arrestee	36	36	26	35	24	157
Camp	7	1	0	4	5	17

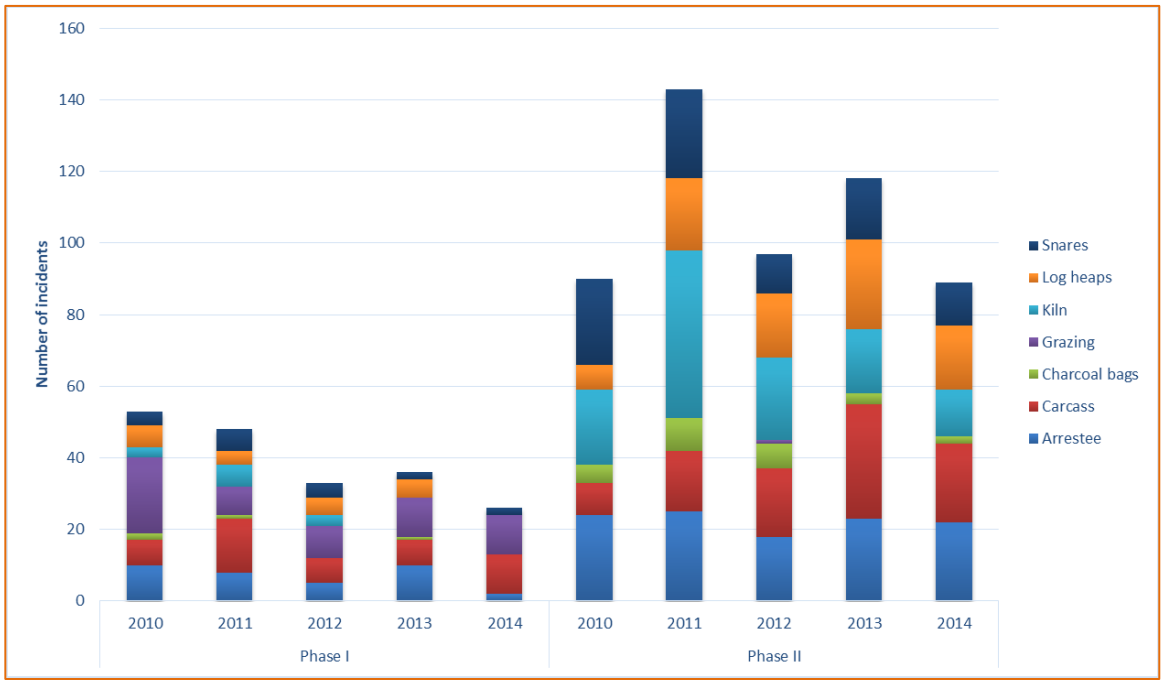
Carcass	22	33	28	39	33	155
Charcoal bags	8	11	9	5	2	35
Fire	0	0	0	0	0	0
Grazing	21	8	10	11	11	61
Human signs	0	0	0	3	3	6
Human-Wildlife Conflict	0	1	0	0	2	3
Injured wildlife	1	6	0	0	1	8
Kiln	26	55	32	18	13	144
Firewood heaps & Poles	15	27	26	32	18	118
Snares	28	32	16	20	14	110
Grand Total	**165**	**210**	**147**	**168**	**127**	**817**

Overall Project

Animal Incidents / Poaching

Table 27: Incidents of animal poaching are shown for each monitoring period.

Species	2010	2011	2012	2013	2014	Grand Total
Buffalo	2	1	0	0	0	3
Common Zebra	0	1	0	0	1	2
Cow	0	0	0	0	1	1
Dik dik	3	6	4	3	2	18
Eland	1	0	0	0	0	1
Elephant	12	20	22	28	22	104
Gerenuk	0	2	0	1	0	3
Giraffe	1	0	1	0	0	2
Hare	0	0	0	0	1	1
Impala	1	1	0	2	0	4
Kongoni	0	0	0	0	1	1
Lesser Kudu	2	1	0	4	2	9
Warthog	0	1	1	1	3	6
Grand Total	**22**	**33**	**28**	**39**	**33**	**155**



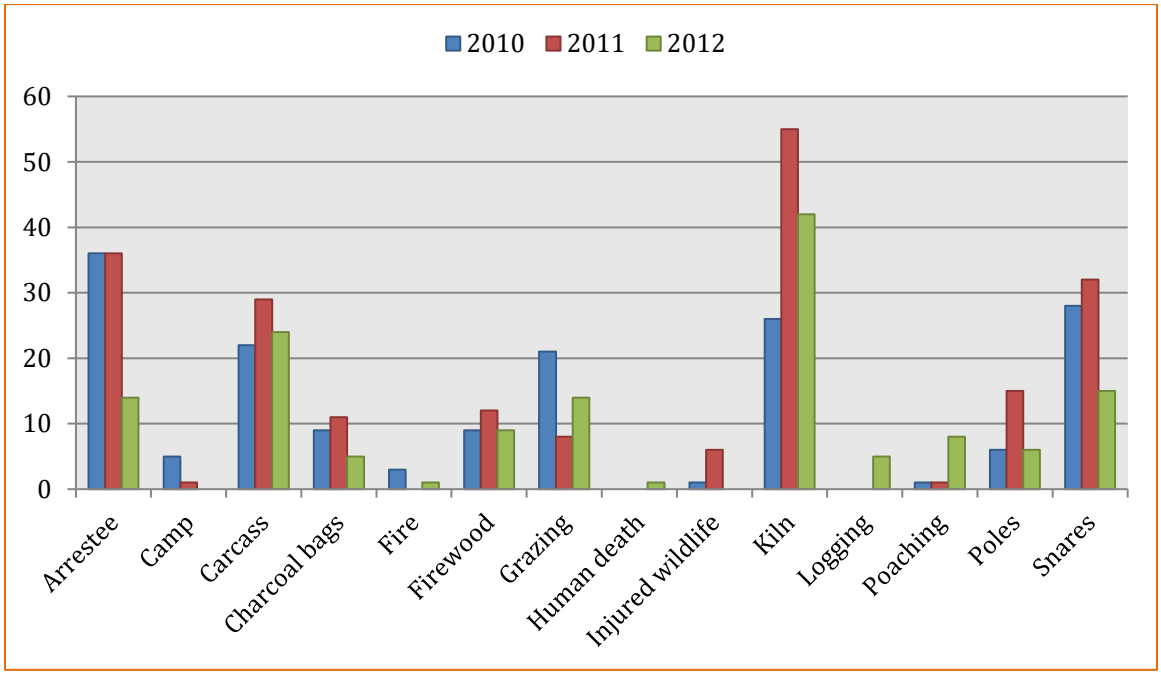


Figure 68: Kasigau Corridor REDD+ Project Phase I and Phase II Recorded Incidents throughout the Project Area

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 (G2.3)

Baseline emissions for the current monitoring period (m_4) 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.

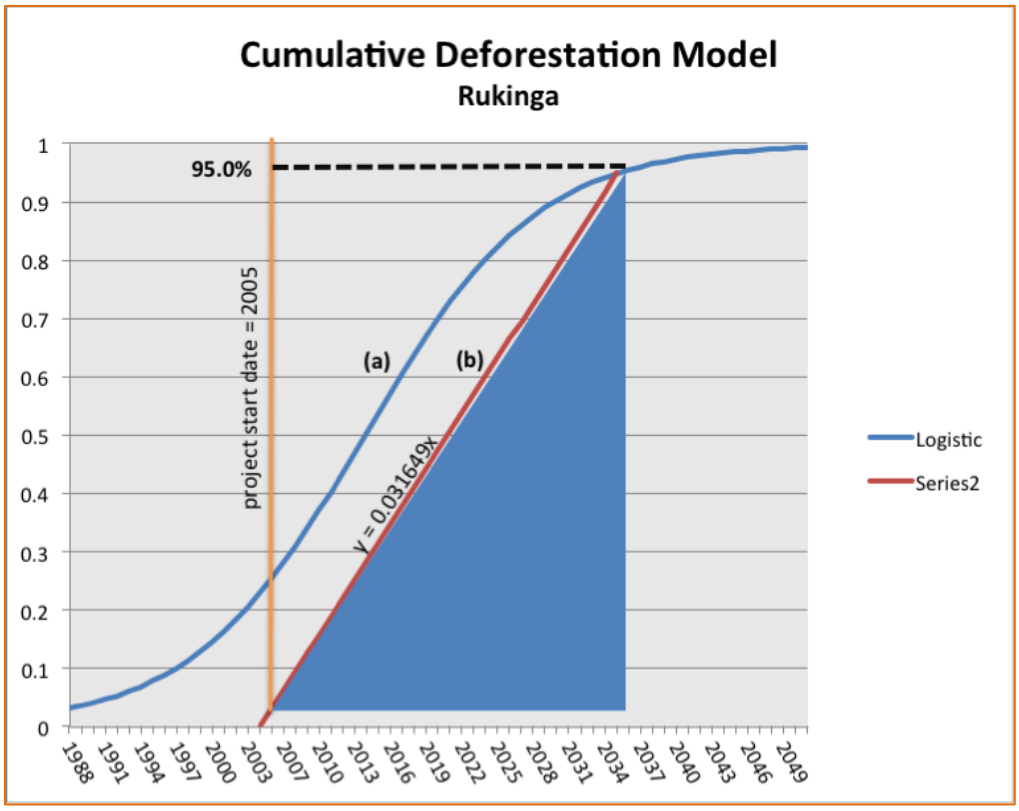


Figure 69: The cumulative deforestation model for Kasigau Corridor REDD+ Project Phase I

Table 28: The cumulative gross and net emission reductions and VCS buffer pool contributions (January 1, 2010 to December 31, 2014) are as follows, by year:

Monitoring Period	2005 - 2010 (m_1)	2011 (m_2)	2012 (m_3)	2013 (m4)	2014 (m_4)	Cum. TOTAL
Baseline deforestation %	11.1%	22.15%	25.32%	**28.48%**	**31.65%**	**–**
Gross NERs	1,450,329	250,465	244,944	**244,054**	**256,777**	**2,446,570**
Percent of ERs to VCS pooled buffer account	20%	15%	15%	**15%**	**15%**	**–**
Buffer tonnes to VCS	290,066	37,570	36,742	**36,608**	**38,517**	**439,503**
Net issued NERs	1,160,263	212,895	208,202	**207,446**	**218,260**	**2,007,066**

6.1.1 Quantify the baseline emissions and/or removals *(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:

Table 29: A summary of all carbon pools in the Kasigau Corridor REDD+ Project Phase I

Pool	Total GHG (t CO_2e)	Loss in Baseline over 30 years (t CO_2e)
Aboveground and Belowground forest biomass (trees, shrubs, grasses)	2,477,966.73	2,352,760
Soils	12,370,530.22	5,230,568
Total	**14,848,496.95**	**7,630,494**
Average Annual loss over 30 years (m.t. GHG) – GROSS NERs		**252,778**

6.2 Project Emissions

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_4). 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_4).

6.3 Leakage

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:

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

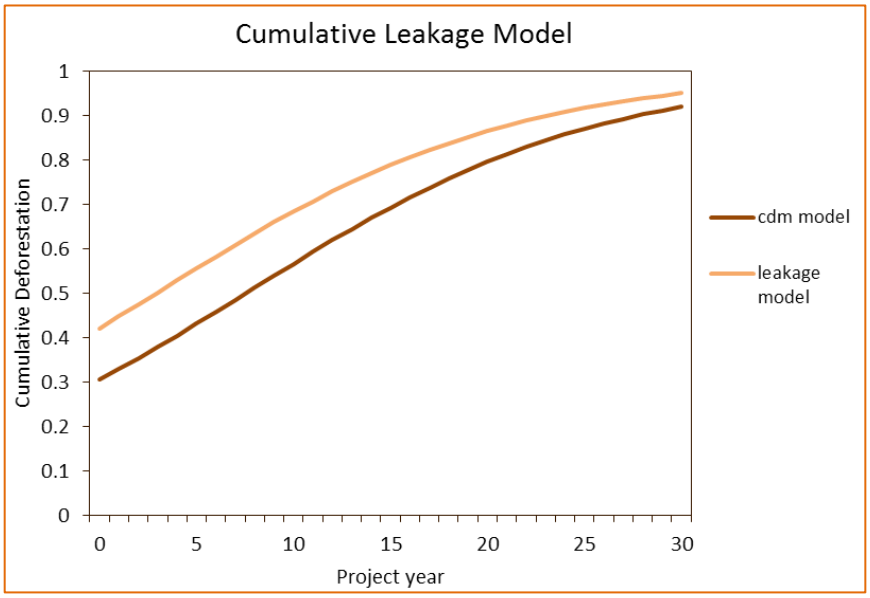


Figure 70: The cumulative deforestation model and leakage model for the Kasigau Corridor REDD+ Proejct Phase I

For this 4th monitoring period, $\hat{\delta}_t$ is measured as the estimate of cumulative deforestation and degradation in the leakage plots:

$$\hat{\delta}_4 = 0.432$$

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]:

$$C_{LE}^{[3]} = \hat{r}_{LE}^{[3]} C_{BE}^{[3]} = 0 \cdot 425{,}706 = \mathbf{0}$$

6.4 Summary of GHG Emission Reductions and Removals (CL1.1-4 & CL2.3)

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_4 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_4 monitoring period (20%, randomly selected):

Table 30: The Baseline deforestation percentage, Gross Emission Reductions, Net Emission Reductions and VCS Buffer Pool contribution for the M_4 monitoring period for the Kasigau Corridor REDD+ Project Phase I

Component	Value
Baseline deforestation percentage, m_4	30.07
Uncertainty Deduction	0
Project Emissions, m_4	0
Emissions from Leakage, m_4	0
Gross emissions reductions, m_4	500,831
NERs to Buffer Pool, (15%), m_4	75,125
Net emissions reductions NERs, m_4	**425,706**
Standard error	641,784.23
Error percentage	**8.47%**

6.5 Climate Change Adaptation Benefits (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 (CM1.1-2)

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.

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.

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 (CM2.1-3)

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 REDD+ 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 (GL2.1-5)

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 (B1.1-5)

8.1.1 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.

8.1.2 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.

8.1.3 Describe Invasive Species Used by Project

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

8.1.4 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.

8.1.5 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 (B2.1-3)

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

8.3 Exceptional Biodiversity Benefits (GL3.1-4)

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

9.1 List of Allometric Equations

$f_p(\cdot)$ 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 REDD+ 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 area 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	Printing Factory	Rangers	Workshop	Security (watchmen)	Greenhouse	Biodiversity / Chili Project	Eco – Charcoal Project	Housekeepers	Soap Factory	Carbon Sampling	Jojoba Project	Total Permanent	Number of Local employees	Number of Non-local employees	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	2051277	39	511452	181	2562729
	2	May	7	6	18		73	3	10	9			5	1	11	1	144	140	4	2070928	41	321200	184	2392128

	2	June	7	6	18		73	3	10	16			5	1	11	1	151	147	4	1988045	99	326918	249	2314963
	3	July	8	9	19		72	14	10	15			6	1	11	1	166	163	3	2888771	41	545265	206	3434036
	3	August	8	9	21		72	19	10	15			6	1	11	1	173	170	3	2870434	131	608257	303	3478691
	3	September	8	10	21		72	19	10	15			6	1	10	1	173	170	3	2896699	129	594491	301	3491190
	4	October	8	10	21		72	19	10	15			6	1	10	1	173	170	3	3040069	92	627796	264	3667865
	4	November	9	11	22		72	15	10	15			6	1	11	1	173	168	5	3837544	92	412253	264	4249797
	4	December	9	11	25		72	15	14	15			6	1	11	1	180	175	5	4106658	90	456461	269	4563119
2012	1	January	9	11	26		72	15	14	15			6	1	11	1	181	178	3	3618069	123	525675	303	4143744
	1	February	9	12	29		73	16	12	15			6	1	11	1	185	182	3	3689494	118	858831	302	4548325
	1	March	9	12	28		75	16	12	15			6	1	11	1	186	183	3	3663851	115	899100	300	4562951
	2	April	9	8	36		73	16	14	13			4	0	15	1	189	185	4	3137886	116	823169	304	3961055
	2	May	9	9	30		73	17	15	13			4	0	15	1	186	182	4	3251301	117	1001481	302	4252782
	2	June	10	11	62		73	18	18	15			4	0	15	1	227	223	4	3603759	121	738105	347	4341864
	3	July	10	10	64		75	18	16	15			4	0	16	1	229	225	4	4014419	79	685381	307	4699800
	3	August	11	12	66		76	22	16	15			8	0	15	1	242	238	4	4828275	74	638904	315	5467179
	3	September	13	12	62		81	23	18	23			15	0	19	1	267	263	4	6288872	90	545920	356	6834792
	4	October	13	12	61		81	24	19	24			15	0	15	1	265	260	5	6469134	134	756091	398	7225225
	4	November	14	13	66		81	24	19	23			16	0	16	1	273	268	5	6598660	152	1241415	424	7840075
	4	December		14																				
2013	1	January																						
	1	February																						
	1	March																						
	2	April																						
	2	May																						
	2	June																						
	3	July																						

	3	August																					
	3	September																					
	4	October																					
	4	November																					
	4	December	13	6	62	5	83	55	25	30	9	12	18	2	32	1	356						
2014	1	January																					
	1	February																					
	1	March																					
	2	April																					
	2	May																					
	2	June																					
	3	July																					
	3	August																					
	3	September																					
	4	October																					
	4	November																					
	4	December	9	11	60	7	86	57	26	27	8	9	18	4	31	0	359						