



FINAL PROJECT REPORT

Ecological Assessment of Kibauni Hill Forest to document its floristic composition and scale up conservation initiatives

Funded by the Rufford Small Grants for Nature conservation

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Executive Summary

Green Resources Initiative with financial support from the Rufford Small Grants for Nature has been implementing a one year biodiversity conservation project in Kibauni forest hill, Mwala district. The broad objective of the project was to conduct a botanical inventory of the forest and build a baseline data on the floristic composition, structure, distribution and establish the conservation status of the forest species to enhance conservation efforts. An ecological assessment of plant species of Kibauni hill forest has been completed in partnership with scientists from the National museums of Kenya. A separate report is attached for this purpose. It is worth noting that two assessments were carried out and data from both the dry season and the wet season analysis were compared to give the final report attached. This was followed by massive call for conservation of the forest with 6 locational workshops being held in different parts of the division namely Kyalavo, Kilala, Katulani, Kiundwani, Mutula, and Ikalaasa. After the mobilization and sensitization workshops, Green resources Initiative has been able to establish in partnership with the community groups a nursery of 70,000 tree seedlings and so far 40,000 tree seedlings have been planted in the forest as enrichment planting and reforestation of degraded areas that had been previously cleared for farming. Over 15,000 tree seedlings have also been distributed to farmers around the forest and they have been planted in farmlands as agroforestry. Out of these 55,000 seedlings planted, 90% are indigenous species and a recent survival check in view of the expected April short rains has recorded over 92%. In partnership with the ministry of Environment and mineral resources through the District Forest Officer and the provincial administration, a survey of the forest was done and boundaries have so far been drawn and marked clearly. This has given the community the much needed authority over protection of its resources. 3 workshops were conducted to educate the community on climate change, participatory forest management, (PFM), the roles, responsibilities and rights of the community in protection of this vital resource in relation to the new forest Act (2005) and the newly enacted constitution as well as other crosscutting issues. Training on energy saving Jikos and energy conservation was conducted and 30 community members including artisans, the youth and women were trained on construction, as well as benefits of energy saving jikos dubbed “Roket stoves”. Over 300 energy saving jikos have been constructed in the area and an energy committee was established to keep the work going on as well as monitor and report on its progress to the divisional home economics officer. A

community forest association that was recently formed with over 3000 members was trained on participatory forest management and it is working towards the development of a participatory management plan which they will enter into a management agreement with the Kenya forest service on the management of the forest resources. Green resources efforts have been a success so far and our partnerships with the community members, community based organizations, institutions of learning and other stakeholders including the ministry of environment, ministry of agriculture, ministry of gender and social services, the provincial administration have been strengthened. In view of the above, Green Resources Initiative has been able to execute its mandate timely as discussed in this end of term report. Green Resources Initiative acknowledges the timely support from the Rufford Small Grants for Nature that has seen the success of this project so far and the support and collaboration from all the stakeholders involved in the implementation of the project. We are once again grateful to the Rufford Small Grants for Nature for supporting this noble cause.

Specific Objectives

- Conduct a plant ecological assessment of the forest and build a baseline data on the floristic composition, structure, distribution and establish the conservation status of the forest species to enhance conservation efforts
- Conduct 2 training workshops to disseminate the information and initiate conservation activities in the forests and its environs
- Establish one central nursery with total capacity of 50,000 tree seedlings of indigenous species such as Acacia, Combretum, Balanites, Melia and Moringa within the project area which will serve as a source of seedlings for reforestation exercise and planting of community woodlots.
- Train community members on afforestation, climate change and maintenance of natural forests as well as the new forest act (2005) and participatory forest management.
- Involve the local people in the rehabilitation of degraded forest land in Kibauni hill forest by planting 50,000 indigenous tree seedlings in the forest as well as in farmlands.
- Conduct periodic survival counts and train community scouts on conducting survival counts for replacements
- Generate a report at the end of the project period

Expected Outputs/components/activities:

- Promotion of indigenous species for afforestation
- Environmental awareness programs led by local communities Green Resources Initiative and other partners.
- Protection of traditional resource management systems and restored biodiversity.
- Promotion of community-based natural resource management and income generation as a way of maintaining or enhance the functional and ecological integrity of the forest and its habitats in the area
- Capacity building of communities and community based organizations living around the forest
- Building of synergies between stakeholders and the community for the protection of the forest resources

Project Implementation approach:

The project had a strong logical framework with activity verifiable indicators and outputs that were used as monitoring and evaluation tools in assessing the project progress. The project adopted a participatory approach to project implementation. Recruitment and maintaining of experienced project staff has been vital for successful project implementation and co-operation between all stakeholders and Green Resources Initiative. All planned activities were implemented by Green Resources Initiative in the established timeframe.

Stakeholder participation/public involvement:

The project involved the Government of Kenya through the line ministries, Ministry of Environment and Mineral Resources, Ministry of Agriculture, Ministry of culture and social services as well as the local government, National Museums of Kenya and community based organizations as well as community members.

Sustainability:

The sustainability of project is highly probable because the strong interest shown by the local communities. Green Resources Initiative also intends to play a complimentary role in the continuation of the project after the end of the execution period. Training and capacity building has been a key pillar in all activities and this will ensure that the community is able to handle many aspects of the conservation initiatives started. Scouts have been trained on conducting and reporting on survival counts and the mobilizing the community for replacements. The community views the forest as their resource and they are actively engaged in conservation initiatives.

Replication:

The project area is huge and the current funding is not adequate for the scope of activities in all the communities. There is the need for additional funding in the future for replication and biodiversity monitoring work on of activities as per the recommendations. It is also recommended that we conduct a survey of other species like bird species in the forest which are of ecological importance.

Cost effectiveness:

Given the results of the project and the funds spent it can be concluded that the project has been cost effective. Without the Rufford small grants for Nature, the project could not have been implemented with the limited financial support from Green Resources Initiative and the community.

Monitoring and evaluation:

The project had a strong contingent of competent field support staff and site manager. Periodic monitoring Green Resources Initiative and other community leaders were very effective. There were records of internal evaluation of the project.

Structure of the end term project report

Background

The project was implemented in 3 locations in Kibauni division covering the entire catchment of the forest. The total population of the area as per the 1999 central bureau of statistics (CBS) census was 17,000. According to the project background document, baseline survey and confirmed by the local communities, the provincial administration and the Kenya forest service, prior to the implementation of the project, the area was experiencing land and forest degradation and loss of valuable biodiversity resources resulting from unsustainable harvesting of forest resources, rapid conversion of forestland into agriculture, uncontrolled bushfires, erosion and unsustainable farming practices. The integrity of both these habitats in the area being undermined by human induced pressures. In Ikalaasa, the leeward side of the hill, it was observed that the forest had receded by about ½ km. currently a greater area is under natural regeneration after negotiations with the community members living around the forest survey having been done and surveillance being done by the community members themselves through the community information groups and Kibauni community forest association (KCFA).

With the interventions by Green resources initiative and the inclusion of the communities living around the forest in the conservation efforts, tremendous efforts have been achieved in the restoration of the original forest cover as well as facilitation for the formation of Kibauni Community Forest Association (KCFA). The community has been in the forefront in entering into management schemes and conducting scouting for the protection of the newly planted seedlings in the forest as well as conducting other silvicultural operations including survival counts, surveillance to the forest and informing the relevant authorities in cases of illegal activities.

The project was implemented through the following components:

- Biodiversity assessment and monitoring
- Environmental awareness and capacity building,
- Rehabilitation of degraded sites, enrichment planting and agroforestry
- Agricultural resources and Community Capacity enhancement on resource management and other crosscutting issues.
- Energy conservation

Biodiversity assessment and monitoring programme

A botanical survey was conducted to document the floristic composition, structure and conservation status of Kibauni Forest. Vegetation sampling was done along five transects (T1-T5) during both dry (08th October -11th October 2011) and wet (14th December - 17th December 2011) seasons. The transects were spanning from the forest edge to the hilltop and along an altitudinal gradient. Transects T1, T2, and T3 were set on the leeward side while T4 and T5 were set on the windward side of the hill. Sampling zones were established along each transect and within each sampling zone, triplicate plots of 20 by 20 m were sampled. A total of 24 plots were demarcated. In each plot, the plants - trees, shrubs and herbs were recorded in order to provide an overview of plant diversity, composition and structure. The canopy cover and height within the three life form layers i.e. herb, shrub and tree layers were estimated in each plot. Diameter at breast height (DBH) was measured for all trees with heights exceeding 5 meters so as to assess the trees population structure. Threats facing Kibauni forest were assessed by quantifying the indicators of disturbance. Overall, a total number of 155 plant species were recorded during the 2 seasons belonging to 48 families and 117 genera. The five species were found to be Kenyan endemics and two of them are rated as rare or vulnerable. Trees were the most dominant life form occupying over 41% of entire area during the dry season while herbs (39%) were most dominant in the wet season. A comparison of stem size distribution between trees on the windward and leeward side showed that the tree population structure on the leeward side is more stable than with an inverse j-shaped than on the windward side. This could have been caused by high disturbance levels on the windward side. Kibauni Hill is surrounded by high human population and most are poor forcing them to depend heavily on the natural resources of Kibauni Hill. A number of threats facing Kibauni Hills plants were observed. This included cattle grazing, tree poaching, firewood collection, charcoal burning, debarking of herbal plants and soil erosion. In conclusion, Kibauni Hill forest is a dry forest with low stature and open canopy. The forest serves as refugium of plant diversity. However; it is highly threatened by anthropogenic interference especially on the windward side of the forest. The survival of the plant diversity is therefore at risk and continued efforts are necessary to keep the conservation efforts started alive and ensure more degraded areas are rehabilitated.

Environmental awareness and capacity building

Six Environmental awareness and training workshops were conducted in all three locations (Kibauni, Ikalaasa, and Ngomano) with 9 sub locations having been reached out. These meetings involved the community based organizations in the area, community groups, the provincial administration (chiefs, and sub-chiefs), local government, the line ministries of Environment and mineral resources, Ministry of Agriculture, Ministry of water, Ministry of gender and social services and Green resources Initiative. An initial leaders' meeting took place to introduce the project and its activities in the area and to get the required support and backup of the leaders and the community groups. This inception meeting took place at Katulani chiefs camp. It was here that information about the specific activities of the project was communicated to the divisional leaders and their roles in ensuring that the project is successful were outlined. All questions were answered at this planning phase.

Training on the new forest Act was conducted to the newly formed Kibauni Community Forest Association whose formation was facilitated by Green Resources Initiative. This involved the Ministry of Environment and Mineral resources through the District Forest Officer. It was here that the community was trained on their roles, responsibilities and rights as it pertains the management of this vital resource as well as on the initiation of the forest management plan which will govern on the documentation of the natural resources in the forest and how the community can manage as well as gain from its participatory management. While community-based sustainable land use and forest management activities were piloted in the 3 locations threats of encroachments and destruction of the environment were more pronounced in 2 of the 3 locations and this is where Green resources Initiative concentrated more on rehabilitation work.. A total of 6 workshops, seminars, trainings and 2 public barazas were conducted with a total of more than 3000 people reached. Community information groups were formed around the main resources in the area namely;

- Forest resources committee
- Water resources committee
- Agricultural resources committee
- Information resources committee and
- Energy resources committee

These were formed to be the community steering committees to work in close collaboration with the implementing partner Green Resources Initiative towards achieving the stated project objectives. Trainings and capacity building were done to individual farmers as well as groups on biodiversity conservation, climate change, and water and energy resources as well as on financial mobilization and income generation as seen in the project status matrix. The project seeks to strengthen these institutions, primarily through extension, training and organization to allow them to participate in resources management and fulfill their new roles.

Rehabilitation of degraded sites, enrichment planting and agroforestry

After the biodiversity assessment, a massive call for conservation of threatened species as well as species of concern and other indigenous species was started. The community was engaged in seed collection, nursery planning, sowing of seedbed and potting as well as pricking of seedlings. A total of 60,000 seedlings were raised at the nursery site including fruit trees, agroforestry species as well as indigenous seedlings. During the rain season of November to January, a total of 40,000 indigenous tree seedlings were transplanted to the hill with the help of the Ministry of Environment and mineral resources who offered help to transport the seedlings to the hill. The community was mobilized to conduct the digging of holes, planting as well as conducting periodic monitoring of the seedlings planted.

Agroforestry

A total of 15,000 agroforestry tree seedlings including fruit trees have so far been distributed to the community members and farmers to plant in their farms as woodlots and fruit trees. This will be able to ease pressure on the hill and ensure that communities living around the forest have sufficient trees in their farms to supply them with the required firewood and timber requirements. It is worth noting that the species promoted for agroforestry are well known for their fast growth as other numerous benefits.



Agricultural resources and capacity enhancement

This was identified as a key strategy in meeting the stated objectives as most of the people living around the forest were peasant farmers. Conservation of biodiversity in this area was pointless without informing the community about the effects of climate change in relation to biodiversity destruction unsustainable resource utilization. Training of 60 farmers (Trainers of Trainers-ToT's) on climate change coping and adaptation mechanisms was undertaken and it is expected that such trainings will still go on to increase the number to at least 200 farmers across the division through multiplier effect. It will involve training them on climate change adaptation and coping mechanisms to help the community members identify low risk crop varieties to grow in the area as well as equip them with knowledge on climate change mainstreaming in their operations eg (Traditional seeds, seed collection, storage, treatment and post harvest technologies on identification of indigenous crops and establishment of indigenous crops seed banks units as well as their management).



Agricultural activities have been initiated in the area for income generation as well as nature based enterprises. Some of the income generating activities that have been initiated include, bee keeping and apiary management, value addition of different hive products Dairy goat rearing and other horticultural crop growing like kales, spinach and tomatoes have also been started.



1 exchange visit was organized and farmers were taken to field days during world food day to be able to learn best practices in other areas of the division with success stories. Fish farming has been also initiated in the area with one fish pond having been established and operating with a total of 1,000 fingerlings in place. This will increase

their livelihood options, increase their incomes, enable them scale up the piloted technologies as well as cushion them against effects of climate change.



Farmer exhibitions and exchange visits

A farmer exhibition was organized to showcase good agricultural practices as well as exchange knowledge at the divisional level. This was important in bringing on board a divisional exhibition to act as a ground for knowledge/experience sharing and farmers to exchange ideas on best agricultural practices and be able to see for themselves some of the successful projects within the division for replication and multiplication. It also formed a basis for networking on which people can exchange contacts, make sales and promote their best practices in the division. Expected at the end of the project is a knowledgeable farmer who is able to replicate some of the learned experiences for better food production and income.

Energy Resources

Training on energy saving technologies was conducted for a refresher for 30 selected community members under the energy resources committee. This saw the construction of energy saving stoves in the area targeted at saving the amount of fuel wood that is being consumed by these local people of this area. A total of 300 energy saving ‘rocket stoves’ have so far been constructed to individual homesteads and it is expected that after the training, construction and fabrication of the jikos will be both an income generating venture as well as an energy saving initiative. At the end of the project, it is expected that 2 institutional energy saving jikos will be constructed in two institutions of learning and 400 units of energy saving jikos will be constructed in the three villages.

Project effectiveness and results

Overall Effectiveness

Critical analysis of the activities implemented within this period indicates that all the project objectives and targets were met and in some cases exceeded as well as other multiplier effects witnessed. It was observed that through the project various national laws and regulations on the protection of environment have been enacted and the community trained on them. Degraded forest areas are being restored and the forest ecosystems are functioning as the forest integrity and richness are gradually being restored. The general environmental conditions in the project areas are seemingly improving and the local land management systems are becoming more effective. Local people now link their future wellbeing to the sustainable management of biodiversity of the forest. The understanding of the concept of biodiversity conservation has increased at the community levels, especially in the management of forest resource and surrounding water and riverine resources. Community structures have been developed for sustainable resource management including water, agriculture, forest and wildlife with one community forest association trained and strengthened. A new partnership has been formed on community adaptation to climate change between Green resources initiative, Kibauni community forest Association (KCFA) and INADES formation which has come in to support a three year project on climate change in the area.

There has been a positive but limited impact of the project on poverty reduction. Hence there is the need for more effective in-built alternative livelihood activities as a complement to the biodiversity conservation strategies. This is because sustainable environmental resource management and biodiversity conservation are a long term investment with future benefits for a larger society, therefore those sacrificing today need to be supported with activities that have short term benefits.

The implementation of the project has created a strong civil society capable of sustainable resource management, which is also creating wealth and advocating for civil rights for its members. It was also observed that the participation of the Kenya forest service in the whole project implementation was very strong especially during the formative stages of the Kibauni Community Forest Association which gave legitimate backings to the enforcement of certain environmental laws and regulations and ensure its sustainability.

The implementation status of the project objectives from reviews of project activities and our own field investigations is summarized in Table 2 below:

Table 1: Implementation Status matrix of Project Objectives

PROJECT COMPONENT	KEY PERFORMANCE INDICATOR	IMPLEMENTATION STATUS	Verifiable Indicators	REMARKS
Awareness Creation among inhabitants living in the project catchments area	300 inhabitants living in the project catchments area directly and over 3000 indirectly educated on current biodiversity and forest policies and laws as well as their rights and responsibilities	5 workshops, seminars and public barazas were organized in all the locations surrounding the forest. The total number of people covered was over 600.	<ul style="list-style-type: none"> • Workshop reports • Interview with beneficiary communities 	The awareness creation coverage was extensive covering most of the communities in the project areas. The awareness creation helped to negotiate inform the beneficiaries about the project objectives and is gradually changing the habit and perception of the people towards the environment.

PROJECT COMPONENT	KEY PERFORMANCE INDICATOR	IMPLEMENTATION STATUS	Verifiable Indicators	REMARKS
Community-based resource management.	1 central tree nursery with total capacity of 70,000 tree seedlings has been established	1 permanent nursery and 55,000 indigenous seedlings planted Kibauni forest hill and its environs in collaboration with stakeholders.	<ul style="list-style-type: none"> • Physical inspection of nurseries at project site. • Field records of seedlings supplied to communities • filed records of seedlings planted at the hill 	The number of nurseries achieved the target of 50,000 seedlings. However during the site visit it was observed that the capacities of the nurseries were big enough to supply the seedling needs of the entire division. At the end of the rain season there were still some seedling which has not been lifted for planting as planting could not continue after end of rain season
Botanical assessment	1 botanical assessment conducted	2 assessments were conducted, during the dry season and during the wet season	<ul style="list-style-type: none"> • An assessment report 	There was need to conduct two assessments for comparison purposes. This was done on a timely manner. Target was met

PROJECT COMPONENT	KEY PERFORMANCE INDICATOR	IMPLEMENTATION STATUS	Verifiable Indicators	REMARKS
Community Monitoring and surveillance	Community trained on conducting periodic monitoring, survival counts and silvicultural operations	Over 5 community groups trained on monitoring, survival counts, replacement and reporting 1 Community Forest Association strengthened and trained on participatory forest management, climate change as well as new forest act (2005)	<ul style="list-style-type: none"> • Monitoring reports, • Data on survival counts and replacements done on time • Partnerships enhanced and strong Community forest Association 	The success of the project as been attributed to strong involvement of the community members and thorough training on their roles, rights and responsibilities with respect to the management of their resource. Target was met

PROJECT COMPONENT	KEY PERFORMANCE INDICATOR	IMPLEMENTATION STATUS	Verifiable Indicators	REMARKS
Income generation and nature based enterprises	Provision High yielding milk goats as well as training to farmers	15 high yielding milk goats supplied to different self help groups for milk supply and breeding	<ul style="list-style-type: none"> • Physical inspection of goats supplied at project site. • Field records of management and yields • Physical inspection of the beehives 	Target was met. Training component has been highlighted above
	Supply 30 beehives to farmers as well as train farmers	30 beehives were sources and installed		Target was met though colonization is yet to occur as installation and training were recently carried out.
	Support for horticultural crop development	Support for the growth of vegetables including kales, sweet potatoes, mangoes, and tomatoes	1 green house was constructed, sales records as well as physical field inspections	Target was met.

PROJECT COMPONENT	KEY PERFORMANCE INDICATOR	IMPLEMENTATION STATUS	Verifiable Indicators	REMARKS
Tree Nursery management	Train 100 individuals, 200 farmers and with multiplier effect of 1,500 community members on tree nursery establishment and management, agroforestry, afforestation and maintenance of natural forests	250 local people trained on tree nursery establishment and management	<ul style="list-style-type: none"> • Project reports • Interview with some of the trained nursery attendance • Community nursery in place with over 50,000 tree seedlings 	Each activity is being monitored and managed by a committee selected by the communities. Target was met

Critical observations

The project was implemented in Kibauni division of Mwala district. It covered three administrative locations with a total population of about 17,000 people as per the 2009 Central Bureau of Statistics (CBS) population census. Critical analysis of the activities implemented within this period indicates that most of the project objectives and targets were met and in some cases exceeded. It was observed that through the project various local national laws and regulations regarding to environmental conservation and restoration and through participatory approach have been adopted and entrenched into communities activates, as well as enforced. This in particular is the formation of Kibauni community forest association, capacity building of the same association in collaboration with the Kenya Forest Service in light of the new constitution and the forest act (2005). Degraded forest areas are being restored and the forest ecosystems are functioning as the forest integrity and richness are gradually being restored. The general environmental conditions in the project areas are seemingly improving and the local land management systems are becoming more effective. Local people now link their future wellbeing to the sustainable management of biodiversity of Kibauni forest Hill and its environs.

The understanding of the concept of biodiversity conservation has increased at the community levels especially in the management of biodiversity resources and the surrounding water, agriculture and forest resources. In relation to resource management a very important achievement is the initiation of a dynamic process within the community to know the plant resource of Kibauni hill forest as a starting point of conservation. Community structures have been developed for sustainable resource management including water, fisheries, forest, agriculture and energy.

There has been a positive but limited impact of the project on poverty reduction. This being resource intensive and long-term investment, there is the need for more effective in-built alternative livelihood activities as a complement to the biodiversity conservation strategies. This is because sustainable environmental resource management and biodiversity conservation are a long term investment with future benefits for a larger society, therefore those sacrificing today need to be supported with activities that have short term benefits.

The implementation of the project is creating a strong civil society capable of sustainable resource management, which is also creating wealth and advocating for civil rights for its members. It was also observed that the participation of all stakeholders in the whole project implementation was quite important and inclusion of the provincial administration through the local chiefs and sub chiefs was useful in the project implementation which gave legitimate backings to the enforcement of certain environmental laws and regulations and this ensures its sustainability.

Lessons learnt

The implementation of the Kibauni Hill forest biodiversity conservation project has unearthed certain important lessons which need to be considered as part of the strategies for sustainable resource management in any future project. These lessons are discussed below:

- Sustainable biodiversity conservation and resource management means sustainable livelihood. Therefore to halt the ongoing environmental degradation, there is the need to combine poverty alleviation and environmental concerns by investing in activities that would achieve tangible and immediate impact on poverty alleviation through a more sustainable, or a less unsustainable, use of the natural resource base.
- Although the civil society is willing to participate in sustainable natural resource management, their capacities are weak to carry out the responsibilities. Genuine stakeholder involvement in resource management and sharing of responsibilities require that capacities of these groups be developed up to a level where it can be self-sustaining.

Based on the findings and lessons learnt from the project implementation, it is recommended that the project gains should be consolidated and expanded. Future interventions should devote a greater part of the project resources to developing further local level capacities for sustainable management of natural resources and biodiversity conservation. Alternative livelihood components should be combined with sustainable resource management activities in all the project areas. This will sustain the interest of the beneficiary communities, in the medium to long term.

CONCLUSIONS AND RECOMMENDATIONS

The implementation of the project has been successful and the evaluation mission therefore recommends the continuation of the project. The following are recommended:

- Further development of capacity and opportunities at local community levels (as groups, families, or individuals) should be promoted. The objective is to equip people with the requisite capacity for sustainable biodiversity conservation.
- One year is not long enough to experience the impact of an environmental intervention. The benefits from the project could be better seen after several years of sustained activities
- Alternative livelihood activities like bee keeping, high yielding goat rearing, fish farming, traditional seed bulking and multiplication for low risk crops should be introduced to the project beneficiaries especially the women's groups
- The project achievements need to be consolidated and complementary activities should be continued and extended to cover more communities in the division since the region is the last host of Kibauni forest.
- The indigenous environmental laws which have been revised need internalized to ensure its sustainability. A strong commitment from the District Assemblies to support local communities to enforce the laws should be promoted.
- Adequate protection needs to be provided for trees planted and nurseries so that they are not left at the mercy of human and domestic animal disturbances
- Birds of conservation concern were noted in the area and there is need to conduct a survey of bird species in the forest.