ENHANCING CONSERVATION OF MAGOMBERA FOREST THROUGH PRACTICING MODERN BEE KEEPING BY ADJACENT LOCAL COMMUNITIES.

BY

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ABSTRACT

The Magombera forest is a home of endemism and diversity of biological species including the endangered one. The Udzungwa Red Colobus monkey and the Magombera chameleon are among endangered and endemic species in the area. However the forest is facing high threat of disappearing through the pressure from adjacent local communities. This project was aiming at improving conservation of remaining part of Magombera forest by involving the adjacent community through restoration initiatives and modern bee keeping as alternative way of livelihood. Generally the project was very successful. Modern bee keeping was introduced and practiced successfully. 89% of trees planted for restoring degraded area grow well; only 11% of trees planted were not successful growing. It is then planned to increase the scale of the project by involving many participants' specifically local people as most of them shows great interest of the project.

1.0 INTRODUCTION

Magombera Forest is part of the Udzungwa ecosystem in the southern end of the Eastern Arc Mountain Range in South-central Tanzania. The forest is diverse in terms of flora and fauna. It has several wildlife species like Leopards, Elephants, Buffaloes, Black and white colobus monkey, Udzungwa Red colobus monkey and the Magombera chameleon (WWF, 2010).

Magombera forest reserve was gazetted in 1955 because of its value as water catchment area. Over years after its gazettement, it has been reduced in size and degraded through encroachment and mainly human activities such as trees cutting, deadwood collection, hunting, trees debarking, fishing and wildfires (Mtoka *et al*., 2014). The remained forest has approximated 12 Km^2 reduced from the gazetted 15Km^2 that is isolated from Selous Game reserve with an area of 14 Km^2 of the private land. It is located at about 6km from the Udzungwa Mountains National park. The forest is important for its biodiversity value and water catchment (Mtoka *et al*., 2014). The vegetation is composed of mature trees with closed canopy, saplings, herbs and grasses.

The forest harbors endemic and endangered species of plants and animals like Iringa red Colobas monkey (*Procolobus badius gordonorum)*, and Magombera chameleon (*Kinyongia magomberae*) (WWF, 2010; Fisseha, 2013). However, the forest is threatened because of its unclear protection status and lack of proper management. Regardless of the important of the forest, awareness on the conservation of the forest to the local communities around it and the knowledge on sustainable economic utilization of the forest like bee keeping are inadequate. The little conservation awareness and insufficient skills in sustainable utilization of the forest has lead to unsustainable utilization of the forest like logging, lumbering, poaching and agriculture. The canopy of the forest is mostly

intact, however limited regeneration and continued forest use threatens the future of the forest. The main threats are currently wood extraction and forest fires which continue to degrade the forest understory (WWF, 2010). .

Habitat destruction and degradation are major challenges facing conservation today. Various wildlife habitats in Africa have been destroyed and posing high extinction risks to many species. According to WWF (2011), habitat loss threats 85% of all species described in the IUCN's Red List. Much of this destruction is attributed to anthropogenic activities such as land clearing for agriculture, timber extraction, pole cutting, wildfires and charcoal burning. For instance, lowland forests in Kilombero valley Tanzania have been cleared for agriculture because of their fertile soil and flat terrain. The area is subject to growing pressure from increased human population and commercial agricultural expansion. These activities affect ecosystems that are home to many wild species.

Experience from Kichi forest in Rufiji Tanzania have shown that, awareness to the local communities surround the forest through participatory training can reduce the threat of the forest. In addition, if the local communities are empowered in the sustainable utilization of the forest like bee keeping, they are able to provide support in the forest conservation. As means of ameliorating the problems from human to the forest, there is a need to find a sustainable utilization way to benefit the local communities like introduced bee keeping project in Magombera Forest. Apart from bee keeping project, restoration initiatives for this important forest is crucial as it was done in this project.

2.0 OBJECTIVES

The main objective of the project was to create conservation awareness of the local communities surrounding the Magombera forest reserve, empowering them on the modern bee keeping project from traditional one through participatory training and determining the level of forest degradation.

2.1 Specific Objectives

(i) To assess the knowledge of local communities on Modern bee keeping

(ii) To train the local communities and students on conservation and the sustainable way of

   income generation from the forest through modern bee keeping.

(iii) To introduce modern beekeeping techniques

(iv) To train on modern processing, packaging and markets searching of bee products.

(v) To determine the amount of trees cut down for different purpose

(vi) To carryout restoration initiative.

3.0 MATERIALS AND METHODS

3.1 Study area

This project took place at Magombera forest reserve which is bordered by four villages namely Magombera, Kanyenje, Katurukila and Msolwa stesheni

3.2 Methods

3.2.1 Assessment of the knowledge of people on modern bee keeping

Questionnaire and direct questions and answers methods was used to assess the knowledge of community members. Participants responded to pre-prepared questions which were in Swahili language.

3.2.2 Provision of Training

The training involved 30 local communities, 5 local government leaders 20 primary school's students and 20 secondary school's students.

Trainers were qualified personnel from University of Dodoma (UDOM), Save Nature for Life (SANALI), Tanzania Wildlife Research Institute (TAWIRI and district forest and beekeeping officers. The training includes the participatory training in class and field work in the forest. Among others included importance of forest, threats facing the forest, how to conserve the forest and the benefits accrued from forest conservation, bee keeping (techniques, location of apiary, processing, packaging and marketing). In addition fliers on such topics was prepared in English and local language (Swahili) and posted in strategic locations in the villages with high public visit like dispensary, market, schools, clubs, church, mosque, government and NGO offices.

After the training, local communities was requested to participate in the field practical. The 50 bee hives was made in participatory with the local communities and placed in strategic sites.

3.2.3 Determining the level of habitat degradation

Four transect each with 10 Km was set randomly in the forest. In each transect 5 plots with size of 50 m^2 each was set at interval of 1Km apart. In each plot, the number of trees cut down was determined. In addition the number of bees flying, visiting flowers was counted at specified time interval of 5Minutes. This helped to determine the potential of the forest for bee keeping.

3.2.4 Restoration initiative

Through this project, there was an initiative for restoring degraded area by planting trees. Trees planted in the degraded area were determined by assessing the species diversity in reference site.

4.0 RESULTS

4.1 Knowledge on modern bee keeping and conservation of biodiversity

It was observed that 89% of participants had no knowledge on modern bee keeping. Among these, 90% were peasants and 10% were students. 70% of these peasants who had no knowledge on modern bee keeping were females and 30% were males. Only 11% had little knowledge on modern bee keeping. Among these, 74% were students and 26% were peasants.

Modern bee keeping was introduced and there was good success. It is planned to harvest the honey in March 2016 as now there is a lot of honey produced by bees.

4.2 Level of habitat degradation

About 87 stumps were observed and counted and identified. Most of them were *Calycosiphonia spathicalyx* which is known as **"Mmemenang'olo matunda makubwa"** by local name (Table 1)

LOCAL NAME	SCIENTIFIC NAME	N0. OF STUMPS
Mwahe	*Erythrophleum suaveolens*	17
Sunguluti	*Mallotus oppositifolius*	6
Mvule	*Milicia excelsa*	3
Mwali	*Bombax rhodognaphalon*	4
Mmemenang'olo matunda makubwa	*Calycosiphonia spathicalyx*	28
Mgumegume	*Isoberlinia scheffleri*	15
Mvengeluwa	*Cola microcarpa*	2
Msambisa	*Pachystela brevipes*	1
Mpingo	*Dalbergia melanoxylion*	5
Mloulou	*Tabernaemontana pachysiphon*	1
Msisina mweusi matunda makubwa mstari	*Diospyros ferrea*	4
Nyakatitu	*Tricalysia pallens*	1
TOTAL		87

Table 1 Number of stumps of trees observed and counted as per tree cuts

4.3 Restoration Initiatives

 Six hundred trees were planted and almost 89% of trees planted grow and proceed well (Table 2).

NAME	PLANTED	SURVIVED	% SURVIVED
Afzelia quanzesis	150	132	88
Vitex doniana sweet	100	94	94
Cordia africana	85	78	91
Isoberlinia scheffleri	18	15	83
Milicia excelsa	29	24	83
Antiaris toxicaria	14	10	71
Dianthus stellatus	43	39	90
Rapanea melanophloeos	126	117	93
Vernonia sp	35	29	83
TOTAL	**600**	**538**	**89**

Table 2 Number of trees planted for restoration initiatives

5.0 DISCUSSION

The project was very successful. It has been shown that, raising awareness about conservation to the local communities surrounding the forest through participatory training and providing alternative way of livelihood reduces the threats to the forest. When the local communities are empowered in the sustainable utilization of the forest such as bee keeping, they are able to provide support in the forest conservation (Mtoka *et al*., 2014). Introduction of modern bee keeping to local community surrounding Magombera forest save as a means of ameliorating the problem. There are hundreds, possibly thousands of empirical studies that show species richness declining with fragment size (Lomolino 2000). Engagement of local communities in restoration initiatives was found to be good, this made people to have the sense of ownership to the forest.

5.1 CONCLUSSION

Conservation education, awareness and sensitization on the importance of biodiversity should be provided to the communities living nearby the protected area so that they can participate positively in protecting and conserving the area. Involvement of public (Community-based biodiversity

conservation approach) in managing the protected area could be the best option because people will be ready to protect biodiversity and provide information concerning poachers and other threats which may destroy biodiversity in the protected areas. This can only happen if people are aware and are involved. Additionally, alternative way of livelihood should be taught to the community nearby the reserved area so that they cannot destroy resources from the protected area for their livelihood.

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