Lack of benefit sharing undermines support for nature conservation in an Eastern Afromontane biodiversity hotspot

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ABSTRACT. Successful forest conservation in the tropics depends on various biophysical, socioeconomic, cultural, and political factors. Researchers, environmental practitioners, and local people recognize the need to resolve longstanding systemic weaknesses in environmental governance institutions, to make mainstream environmental policy and action, and to find locally informed and adaptive conservation measures. This also applies to the preservation of cloud-forest fragments of the Taita Hills in southern Kenya, a section of the Afromontane biodiversity hotspot. These forest remnants host many endemic and endangered plant and animal species, and suffer under deforestation and forest degradation. We conducted structured surveys with 300 smallholder farmers living around three forest fragments in the Taita Hills. Our results indicate a lack of knowledge about biodiversity and ecosystem functions among local people. We found an inverse relationship between the level of formal education and practical environmental knowledge, and a bias toward the protection of plant species, because of their provisional ecosystem services, as opposed to the protection of wild animals, because they are mainly associated with human-wildlife conflicts and large-scale tourism. Unresolved human-wildlife conflicts and missing benefit sharing from tourism has created an anti-conservation attitude. Our study underlines that nature conservation is only feasible if the local people benefit from it in the medium and long terms, and if the added value of conservation for high human-livelihood quality is clearly communicated.

Key Words: benefit sharing; environmental awareness; environmental communication; human-wildlife conflict; Kenya; landscape degradation; nature conservation; Taita Hills

INTRODUCTION

Conservation of tropical forests in Africa faces a myriad of challenges (Hansen et al. 2020), such as climate change (Hemp 2009), weak governance structures (Agrawal 2007), communication gaps between institutions and people (Habel et al. 2020), and competing interests, such as demands for forest products for the local and global markets (Agrawal et al. 2008). Forests and woodland are neglected in conservation in comparison with African savannahs and bushlands, which are of high relevance for tourism (Riggio et al. 2019). The African continent loses 3.9 million hectares of natural forest each year (FAO 2020). This contributes to increasing habitat fragmentation of the remaining forest habitats (Fähring 2003, Hansen et al. 2020) and to altered habitat quality (Hemp 2009), with negative effects on biodiversity persistence (Brooks et al. 1998, Burgess et al. 2007), reduced ecosystem functions, and subsequently decreasing human-livelihood quality (Agrawal 2007, Büscher and Whande 2007).

There have been efforts toward forest conservation and restoration by different actors with varying degrees of success (Atela et al. 2015, Abiyu et al. 2016, Douh et al. 2018). Effective implementation of forest conservation in both gazetted and community forests largely depends on the attitudes and good will of the local people (Andersson et al. 2007, Ribot et al. 2010, Nzau et al. 2020). People who regard themselves as conservation beneficiaries are more likely to adopt positive conservation behavior, such as sustainable extraction of firewood, as opposed to people who feel disadvantaged by nature conservation measures (Holmes and Adamowicz 2003, Vodouhê et al. 2010). However, positive perceptions and attitudes do not necessarily lead to positive conservation behavior (Waylen et al. 2009).

Attitudes toward conservation also depend on the level of formal education and practical environmental knowledge (Sternberg et al. 2001, Reyes-Garcia et al. 2009, Mawere 2015), gender dynamics (Vodouhê et al. 2010), benefit-sharing arrangements (Mutanga et al. 2015), disadvantages for humans caused by human-wildlife conflicts (Githiru 2007, Kamau and Sloyter 2018, Ceaşu et al. 2019, Killion et al. 2020), degree of poverty, and land available for subsistence farming (Nzau et al. 2020). Additionally, communication barriers and power imbalances between local people and environmental management authorities undermine concerted efforts for nature conservation (Weichselgartner and Kasprow 2009).

The Taita Hills represent an area where cloud forests have been largely destroyed over the past several decades, and current conservation efforts are showing only modest success. The Taita Hills were originally covered with cloud forest, which still represents a suitable habitat for many endemic plant and animal species that occur restricted to these mountains (Burgess et al. 2007, Maeda 2011). Thus, the Taita Hills are classified as an Eastern Afromontane biodiversity hotspot (Mittermeier et al. 2011). This mountain range rises up to 2600 m above sea level and provides cool and humid climatic conditions (Jaetzold et al. 2012), suitable preconditions for forestry and smallholder farming (Maeda 2011, Njeru 2016, Njeru et al. 2017). A major proportion of cloud forest has been transformed into exotic tree plantations and agricultural land during the past decades (Newmark 1998, Githiru and Lens 2007, Pellikka et al. 2009, Teucher et al. 2020). Furthermore, political and social factors, particularly land reforms and population growth, have caused significant losses of natural vegetation (Hohenthal et al. 2015). Today, few cloud-
forest remnants exist (Aerts et al. 2011), and still harbor exceptional habitats for many species (Githiru and Lens 2007, Aerts et al. 2011). There have been various conservation and restoration campaigns that have so far borne only marginal success (Pellikka et al. 2009).

In this study we conducted surveys with smallholder farmers living along forest fragments. With these questionnaires we obtained basic information about education and income, as well as details about the knowledge of nature and biodiversity, especially about the value of forests for people. Furthermore, these questionnaires were used to find out the way of communication with the relevant institution for forest and resource management. Based on the obtained results we will answer the following questions: What kind of attitudes do the local people have toward the protection of plants and animals? How do people perceive the usefulness of the different channels of environmental communication? What are the possible conservation strategies in the light of the current ecological and economic situation in the Taita Hills?

MATERIAL AND METHODS

Data collection
We conducted 300 structured questionnaires around the forest fragments Fururu, Susu, and Chawia (Fig. 1). Answers were recorded with the Open Data Kit (ODK) technology on Android. Participants for the structured questionnaire were selected using convenience sampling (Dörnyei and Griffee 2007). The criteria for convenience sampling include geographical proximity, availability of participants at the given time, and their willingness to participate (Dörnyei and Griffee 2007). In our case, we targeted all available households within a 5-km radius around the three forest fragments. Each survey was answered by only one adult member (> 18 years old) of a single household. A household was defined as all those people who cook and eat together every evening. The representative person of the household, who answered the questions of the questionnaire, was appointed by the rest of the adult family members. The respondents consisted of 52.3% women and 47.7% men, and represented the age classes 21 to 30 years (16.3%), 31 to 40 (19.3%), 41 to 50 (25.7%), and > 50 (38.7%; Table 1). On average, a household consisted of four people. The completion of one questionnaire took about 60 minutes. Data collection was performed during July and August in 2018.

Questionnaire design
The initial version of the structured questionnaire was designed in English and subsequently translated into Kiswahili. The questions were asked by J. M. N. or another Kenyan, who both natively speak Swahili. All answers were re-translated again from Swahili into English, all by J. M. N. The questionnaire was divided into six thematic sections, with 43 questions in total; 17 questions were open-ended. The first section of the questionnaire captured basic social and demographic data of participants. The second section explored the existence and applicability of local ecological knowledge on forest conservation. The third section included questions on land use and land tenure. The fourth section contained questions on awareness of and perceptions toward biodiversity and conservation. The fifth section was on willingness to apply sustainable practices in land management. The sixth section inquired into everyday habits and behavior. The second and sixth sections were largely adapted from Shepheard-Walwyn (2014). The complete structured questionnaire is provided as Appendix 1.

Fig. 1. (A) Study area in Kenya (star in small inlet map), and (B) detailed map showing the three forest patches Fururu, Susu and Chawia, and all locations where surveys were conducted (white dots). This map first appeared in Rülke et al. 2020.

Data analyses
For the present analyses we considered 40 out of the 58 single questions received. We used gender, age, education, and source of information as predictors of environmental awareness in our statistical analyses (Table 1). We combined the answers concerning knowledge about occurrences of animals and plants (survey questions 22 and 23) and of perceived soil erosion, fertility, and non-indigenous plant species (question 29), and derived a simple but effective index of environmental awareness, based on the knowledge of biodiversity and ecosystem functioning and people’s agreement in protecting species and ecosystems:

\[
EA = \frac{1}{2} \left( \frac{A_t + P_t + A_e + P_e}{4} + \frac{SE + SF + NT}{15} \right)
\]
In this equation, $A_t$, $P_t$, $A_e$, and $P_e$ refer to the second section of questions and denote the mentioning of endangered (t) and endemic (e) animals A and plants P coded with 1 (yes) and 0 (no). SE, SF, and NT denote the strength of agreement ($1 = $strong disagreement, $5 = $strong agreement) to the question of whether soil erosion (SE), soil fertility (SF), and use of non-indigenous trees (NT) are problems in Kenya (factors asked for in the third section of questions). The present adjustment makes $EA$ to range between 0 (lack of awareness) and 1 (strong awareness).

**Table 1.** Summary statistics of participants with respect to gender, age class (18-29, 30-39, 40-49, > 50 years), and education (None, Primary school, Secondary school, Higher education).

| Variable | Sum |
|----------|-----|
| Gender  |     |
| Men     | 21  |
| Women   | 28  |
| Sum     | 49  |
| Age class |     |
| 21-30   | 21  |
| 31-40   | 28  |
| 41-50   | 36  |
| > 50    | 58  |
| Sum     | 143 |
| Education |     |
| None    | 31  |
| Primary | 51  |
| Secondary | 69  |
| Higher  | 27  |
| Sum     | 156 |

We further assessed the reasons why participants supported the protection of plants and animals (survey question 24). We grouped the answers given into six values: provisional ecosystem services, traditional value, future generations, aesthetics, tourism, and nature conservation. We analyzed the available sources of information for environmental laws, rules, and regulations that were available to local people (question 25), and how the local people rated the usefulness of the environmental information they got from these sources (question 26). We used nested ANOVA and contingency table analysis as implemented in Statistica 12.0 to infer differences of participants with respect to gender, age, education, and source of information.

Finally, we performed two strengths, weaknesses, opportunities, and threats analyses (SWOT; e.g., Scolozzi et al. 2014, Bull et al. 2015) to discuss possible conservation strategies in light of the current ecological and economic situations. For this task we searched the literature to obtain the latest information on the conservation status and ecological functioning of the study region, as well as on current and envisioned changes in land use. From these sources we compiled the most important issues mentioned with regard to the current states of biodiversity, usage, and forest conservation.

**RESULTS**

**Attitudes of the local people toward nature conservation**

Overall > 60% of participants recorded high levels of environmental awareness, which did not significantly differ between men and women: $p(F_{1,299}) > 0.5$ (A, Fig. 2; Table 2). However, women scored lower in all age classes (B, Fig. 2) with lower educational levels when compared to men (C, Fig. 2). Awareness was weakly related to age class: $p(F_{1,299}) = 0.04$ (Table 2). However, awareness was different between participants of different educational levels: $p(F_{1,299}) < 0.01$ (Table 2). Interestingly, men of intermediate education scored highest in environmental awareness, whereas with women no clear pattern emerged (C, Fig. 2).
Table 3. Contingency table c² tests to detect differences in the answers with respect to gender, age group, and education level with respect to basic questions on nature conservation. Numbers of endangered and endemic animals and plants refer to the numbers of taxa mentioned.

| Question                               | Gender | Age | Education |
|----------------------------------------|--------|-----|-----------|
|                                        | χ² (df=1) | p   | χ² (df=3) | p   | χ² (df=3) | p   |
| Should plants be protected             | 0.82   | 0.36 |           |     | 1.14     | 0.70 |
| Should animals be protected            | 11.11  | < 0.001 | 14.32 | < 0.01 | 33.55 | < 0.001 |
| Number of endemic plants               | 0.01   | 0.91 |           |     | 10.67   | 0.01 |
| Number of endemic animals              | 3.31   | 0.01 |           |     | 2.72    | 0.44 |
| Number of endangered plants           | 0.02   | 0.89 |           |     | 11.74   | < 0.01 |
| Number of endangered animals          | 15.99  | < 0.001 | 4.74 | 0.22    | 2.94 | 0.40 |

Fig. 3. Proportions of participants in four educational groups (N: no school education, P: primary school, S: secondary school, H: higher education) with respect to numbers of (a) endemic and (b) endangered species. Colors: grey: 0 species mentioned, red: 1 species, yellow: 2 species, green: 3 or more species. Error bars denote bootstrapped 95% confidence limits.

mentioned more endemic and endangered plants than participants of secondary or higher education: p(F₁,298) = 0.01 (Fig. 3). However, only a moderate difference appeared with respect to animals: p(F₁,298) = 0.06 (Fig. 3). In total, our data support significant gender differences for the awareness to protect plants, with higher awareness in women than men, whereas no such differences came up with respect to animal protection (Table 3, Fig. 4).

The recurring reasons to protect plants and animals were related to provisional ecosystem services, tourism, and nature conservation. Mentioning of these reasons did not significantly differ between age classes: p(F₃,296) > 0.05 (B, Fig. 4). Tourism was the dominating reason with respect to animals, whereas provisional ecosystem services were most often mentioned with respect to plants (B, Fig. 4), irrespective of the level of education (C, Fig. 4). In contrast, the level of education influenced the way local populations assessed plant and animal protection (C, Fig. 4). Participants with lower education significantly pointed more often to tourism with respect to plant protection than participants with at least a secondary education: p(F₃,296) < 0.01 (C, Fig. 4).

Fig. 4. (a) Proportions of men and women participants who voted in favor of plant (P) and animal (A) protection; (b) Proportions of participants in four age groups who voted in favor of plant protection because of provisional ecosystem services (green) and tourism (red), and in favor of animal protection because of tourism (red) and nature conservation (yellow); (c) Respective proportions of participants in four educational groups (N: no school education, P: primary school, S: secondary school, H: higher education). Colors as in (b). Error bars denote bootstrapped 95% confidence limits.
Use of different channels of environmental communication
Participants clearly differentiated between sources of information on environmental conservation with no significant gender differences (A, Fig. 5). Mass media and official information as well as communications from local chiefs were well received (A, Fig. 5), whereas internet and NGO information was not rated as useful (A, Fig. 5). Older people particularly rated information from the internet as not useful (B, Fig. 5). Interestingly, this age group, being least educated (Table 1; C, Fig. 5), was most sceptical of all external information sources (B, Fig. 5). Usefulness of mass-media information increased whereas the usefulness of internet information decreased with increasing level of education, respectively (Fig. 5).

Possible conservation strategies
Our first SWOT analysis on the forest status highlighted the following strengths: that forest patches provide valuable habitats for endangered plant and animal species, seed banks, various ecosystem functions, and act as important water catchment. As weaknesses we identified insecure land tenure; biodiversity homogenization through the planting of exotic trees; small and isolated forest patches; and lack of implementation of land-use and forest management. Potential opportunities might be green tourism, mobilizing international funding, ethical biodiversity harvesting, ecosystem services provisioning, and the leasing of land for conservation purposes. Threats were demand of land for conservation; ongoing planting of exotic trees; ongoing deforestation of forest patches; demand for firewood and timber; fires; farming along rivers and in swamps; and biodiversity loss (Table 4).

In our second SWOT analysis, we focused on forest conservation, and identified the following strengths: high willingness to conserve and restore forest; high level of environmental awareness; existence of a community forest association; economic benefits through conservation; and international investment in biodiversity hotspots. We identified the following weaknesses: distrust toward forest conservation; weak coordination of activities; distrust toward NGOs; loss of environmental knowledge; and lack of financial resources in conservation. Potential opportunities were bottom-up pressure, mobilization of funding, and international visibility. Main threats were agricultural intensification, historical injustices, corruption, lack of land management, and the financial crisis (B, Table 4).

DISCUSSION
Environmental awareness of people: the interplay among education, age, and sex
We found a high level of environmental awareness among the local people in the Taita Hills when compared with other studies conducted in other regions of Kenya based on identical approaches, such as along riparian forests in the semiarid region of southeast Kenya, and around Arabuko Sokoke coastal forest in the south of Kenya (Nzau et al. 2020). We found a negative relationship between formal education and the knowledge of endemic and endangered animal and plant species. Participants with no or only primary education significantly mentioned more endemic and endangered plant species than participants possessing at least secondary education and higher education. Various explanations for this trend are crucial and not mutually exclusive. First, people with no formal education have a higher likelihood of relying directly on nature, especially for provisioning ecosystem services such as food, medicine, firewood, and building materials (Wangai et al. 2016), as well as for cultural values (Berkes 2012), than people with at least secondary or higher education, who are likely to have waged income (Manda and Sen 2004) and possess alternate spiritual values (Owuor 2007). Second, participants who have at least secondary education are likely to have left their localities to attend boarding schools for extensive time periods, which is the norm of the schooling system in Kenya (Mucherah 2006). It takes four years to complete...
Table 4. Strengths, weaknesses, opportunities, and threats (SWOT) analysis of the current state of East African natural forest fragments.

| Strengths                                                                 | Weakness                                                                 |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------|
| High endemic and endangered biodiversity (Gitirhu and Lens 2007);         | Insecure land tenure due to the land inheritance culture (Maeda et al. 2010); |
| High level of carbon sequestration (Glenday 2006);                        | Non-native species and diversity homogenisation (Omoro et al. 2010);       |
| High degree of water retention (Nicol et al. 2015);                       | Too small forest remnants causing instable populations and vulnerable food web structures (Apfelbeck et al. 2019); |
| Tourist attraction (Mittermeier et al. 2011);                            | Lack of land use and forest management plans (Teucher et al. 2020);        |
| Indigenous tree nursery and bee keeping (Himberg et al. 2009);            | Lack of proper biodiversity monitoring schemes;                           |
|                                                                           |                                                                           |
| Opportunities                                                             |                                                                           |
|                                                                           |                                                                           |
| Increasing green tourism (Jarvis et al. 2010);                            |                                                                           |
| Potential funding for ethical genetic harvesting (Engels et al. 2011);     |                                                                           |
| Future ecosystem service contracting (Gitirhu and Njambuya 2019);         |                                                                           |
| Leasing land to advance fragment connectivity (Gitirhu and Njambuya 2019);|                                                                           |
|                                                                           |                                                                           |
| Strengths                                                                 | Weakness                                                                 |
| High willingness of the local people to restore the forest fragments as   | Distrust or apathy towards forest conservation due to lack of short-term   |
| water towers (Hohenthal et al. 2018);                                     | economic benefits (Holmes 2003);                                         |
| High local environmental awareness (out study);                           | Weak coordination among conservation organisations (our study);           |
| Active Community Forest Associations (CFAs; Wekesa et al. 2021);          | Distrust of local people against NGOs (Kendal and Ford 2017);             |
| International interest in tropical biodiversity conservation (Emerton et  | Loss of practical environmental knowledge (Rogo and Oguge 2000);           |
| al. 2006);                                                                | Insufficient conservation financing (our study);                          |
| Economic benefits on conserving natural forests (Himberg et al. 2009);    |                                                                           |
| Opportunities                                                             |                                                                           |
|                                                                           |                                                                           |
| Bottom-up pressure for forest conservation to restore water tower         |                                                                           |
| (Hohenthal et al. 2018);                                                  |                                                                           |
| International funding of local conservation (McFarland and Ployhart 2015);|                                                                           |
| Private funding of nature sanctuaries (McFarland and Ployhart 2015);      |                                                                           |
| International visibility of local conservation achievements (Mittermeier et |                                                                           |
| al. 2011);                                                               |                                                                           |

secondary education and at least four years to complete higher education in the current school curriculum in Kenya, according to the Ministry of Education (https://www.education.go.ke/). In consequence, people with higher formal education are likely to possess more theoretical environmental knowledge acquired from the classroom than practical environmental knowledge connected to their immediate ecosystem (Sternberg et al. 2001, Reyes-García et al. 2009). Third, the sharp decline of biodiversity in the remaining forest fragments (Teucher et al. 2020) could contribute to an increased disconnect between people and nature (Andersson et al. 2007). The loss of practical environmental knowledge by the Taita people limits their confidence to negotiate for equitable resource management, making them subservient to bureaucratic knowledge systems, which in turn enhances structural power imbalances (Hohenthal 2018). These findings on the trade-offs between formal education and local environmental knowledge underscore the global call for integration of local environmental knowledge in formal school curricula (Müller and Tippins 2010, McCarter and Gavin 2011, Kim and Dionne 2014, Abah et al. 2015, Mawere 2015), but also the need for real world–related and action-oriented forms of environmental education (UNESCO 2017, Rieckmann 2018).

We found that men of intermediate education scored highest in environmental awareness. The school-labor dynamics in Kenya offer important clues to this finding, whereby persons with at least primary education and no further tertiary training are less likely to be absorbed into the labor market (Manda 2004) translating to minimalized probability for out-migration (Ginsburg 2016). Men with average formal education therefore possess both theoretical (i.e., learned in the school setting) and practical environmental knowledge acquired in daily livelihood interactions with the local ecosystems (Sternberg et al. 2001, Owuor 2007, Reyes-García et al. 2010). On the other hand, women with intermediate education are likely to out-migrate for casual labor in the domestic sector (Suda 2002) or marriage (Ginsburg 2016), especially given the limited prospects of inheriting ancestral land (Luke and Munshi 2006, Djurfeldt 2020). The association between formal schooling and local environmental knowledge is complex (UNESCO 2009), and often shows contrasting coherences (Reyes-García et al. 2010). Growing concerns across the African continent show that the inception of academic education systems undermined the pathways for local knowledge transmission (Sternberg et al. 2001, World Bank 2003, Owuor 2007).

**Attitudes toward wildlife: lacking compensation and benefit sharing**

Most respondents expressed little interest in protecting wildlife, favoring the protection of plants over wild animals. Women showed the least support for protecting wild animals. This bias may be understood in the context of the ecosystem benefits provided by plants, whereas wildlife are perceived to be of less tangible benefits to the local people. For instance, diet preferences...
had significantly shifted from bushmeat to present-day domesticated meat sources (Icheria 2019). The inclination to protect plant species over wild animals may further be understood in the context of two factors. First, the long-standing and unresolved human-wildlife conflicts in this region (Hohenthal et al. 2018, Kamau and Sluyter 2018, Rülke et al. 2020, Siljander et al. 2020) led to an aversion to wild animals. This is made clear by women’s indication that the constant scaring away of monkeys is a burden, and some fires set in the remaining forest fragments were for the purpose of chasing away or eliminating monkeys (Appendix 2). Second, the absence of equitable compensation for damage caused by wildlife, and lacking benefit-sharing arrangements from wildlife conservation and tourism worsen this negative attitude toward wild animals (Atela et al. 2015, Chomba et al. 2016; Appendix 2).

Sharing in the gains from conserving protected habitats is a basic requirement for effective conservation. Numerous studies have shown that the integration of the local population into local tourism is essential to establish a long-term marketing and conservation strategy. The Taita Hills clearly show the attitudes toward the last forest fragments that develop when local people do not benefit from tourism. Approximately 62% of the Taita-Taveta County, home of the Taita people, is covered by Tsavo National Park, and another 24% of the land by private ranches and large-scale sisal plantations. Only 11% of the land remained for smallholder farming (Njogu and Dietz 2006). These land-use dynamics and the arising resource use and management contentions (Njogu 2004, Hohenthal 2018) contribute to an inverse relationship between wildlife conservation and human-livelihood needs (Githiru 2007, Hohenthal et al. 2018). Our findings echo the association of wildlife conservation to tourism (Rülke et al. 2020) and unmask reluctance toward forest conservation action that is conceived in the fear of losing the remaining arable land to wildlife conservation (Atela et al. 2015).

**Communication gaps: the role of elders and participation**

We found a twofold communication anomaly in the Taita Hills. First, the local people find that information from governmental and non-governmental agencies is not useful, with older people being sceptical of all external information sources. This might be because older people are less educated, and in general show less positive attitudes toward nature conservation (Table 1). However, older people are extremely critical to the acceptance of conservation, and the general attitude toward the remaining forest habitats. Older people play a pivotal role in the social system in Kenyan communities. Extensive research acknowledges the role of elders in Africa as custodians of local ecological knowledge who are thereby likely to possess practical environmental knowledge (Shizha 2006, Owuo 2007, Berkes 2012). Second, the inclusion of local people in forest governance and decision making is ambiguous and asymmetrical. This is in line with findings from other studies conducted in the Taita Hills (Hohenthal 2018, Rülke et al. 2020, Teucher et al. 2020). The loss of practical environmental knowledge combined with resource-appropriation injustices and the reluctance of Kenya Wildlife Service (KWS) to address human-wildlife conflicts in the Taita Hills set a backdrop for mistrust and structural power imbalances between the local people and environmental management authorities (Githiru 2007, Hohenthal 2018). As a result, environmental communication does not proceed very efficiently (Holmes and Adamowicz 2003, Weichselgartner and Kasprow 2009). This situation becomes particularly clear when taking a closer look at and analyzing the role of Community Forest Associations (CFA) in the Taita Hills. The Forests Act (Government of Kenya 2005) and the Forest Conservation and Management Act (Government of Kenya 2016) provide a formal legal framework for local communities to participate in resource management through CFAs (Teucher et al. 2020). Representative members of CFAs are ideally chosen by the local communities through a democratic process to mediate resource use and benefit sharing. However, we found that CFAs in the Taita Hills lack the skills and financial resources to equitably participate in forest management (interviews 2, 7, and 8, Appendix 2). This lack of capacity reduces the engagement of local people in conservation dialogue to only distant approvers (Kendal and Ford 2017), whose value is to rubberstamp decisions from various governmental and non-governmental organizations. This creates an illusion of active inclusion of local communities (Nzau et al. 2020).

**Taita Hills: strengths, weaknesses, opportunities, and threats**

In our SWOT analyses (Table 4) we identified various strengths. The remaining forest fragments still host many endemic and endangered plant and animal species (Githiru and Lens 2007) and are important for carbon sequestration (Njeru 2016, Njeru et al. 2017). The cloud forests act as water catchments (Kivivouri et al. 2013, Mkaya 2013) and provide indigenous seed banks and medicinal plants, among other ecosystem services (Seifert et al. 2022). On the other hand, insecure land tenure (Maeda et al. 2010) and rapidly declining plot sizes per capita (Nzau et al. 2018) contribute to mismanagement of natural resources across the Taita Hills. The expansion of exotic trees throughout the forest and across farms (Omoro et al. 2010) causes biodiversity homogenization, which has a negative impact on habitat quality and ecosystem functions (Pelikka et al. 2009). Most forest remnants are too small to guarantee long-term persistence of biodiversity (Ulrich et al. 2016, Apfelbeck et al. 2019). Land-use and forest management plans largely do not exist or are only poorly implemented (Teucher et al. 2020). There are still significant threats to be considered such as the potential for legal cases on land ownership especially with the recent ambitions by conservation actors to pursue fragment connectivity (Waguna 2018). The monodominance of planted non-native tree species, continuing illegal deforestation and selective logging (Aerts et al. 2011), and increased demand for firewood resulting in cutting trees and the collection of deadwood (Loader et al. 2009) could pose unintended consequences on already compromised ecosystem health (Pelikka et al. 2009), and which have been connected to drying up of water sources (Kivivouri 2013, Hohenthal 2018). Moreover, increased drought frequencies (Boitt et al. 2015), chronic forest fires, and the general poor enforcement of riparian protection rules exacerbate the declining quality of the Taita Hills. This has a negative impact on biodiversity (Ulrich et al. 2016) and ecosystem functions (Seifert et al. 2022) in the long run. Regardless of these weaknesses and threats, there exist various potential opportunities for positive development in the future, for example, supporting and expanding green tourism in the region (Jarvis et al. 2010), mobilizing international funding for the preservation of global biodiversity hotspots (Emerton et al. 2006), as well as ethical biodiversity harvesting (Engels et al. 2011) and ecosystem service contracting (Chomba et al. 2017, Githiru and Njambuya 2019).
In our second SWOT analysis we focused on the process of change in conservation action for the Taita Hills cloud forests (B, Table 4). There exists high awareness and willingness among the local people to conserve and restore the cloud forests of the Taita Hills as an important water tower (Kivivuori et al. 2013, Hohenthal et al. 2018). The National Forest Act provides a legal background for Community Forest Associations (CFAs; Government of Kenya 2005, Teucher et al. 2020), through which the local people can organize to sustainably take opportunity of the economic benefits, including tree planting, beekeeping, and butterfly farming. These organizations, if properly executed, can tap into the international interest in the conservation of tropical forest biodiversity hotspots (Emerton et al. 2006), in order to upscale benefits and human-environment positive outcomes. However, conservationists ought to be attentive to the following weaknesses: the pervasive mistrust or apathy toward forest conservation because of lack of short-term economic benefits (Holmes and Adamowicz 2003), weak coordination among conservation organizations, as well as distrust toward non-governmental developmental agencies by the local people (Kendal and Ford 2017). This high level of mistrust might also arise from the history of the people in the Taita Hills. The people living in the Taita Hills have much experience in negotiating natural resource rights and in accommodating the historically chronic waves of newcomers into the area (Prins 1952). This situation led to increased pressure on available land, to uncertainties in the property rights of land, and to a high level of mistrust, among other things toward conservation activities.

The loss of practical environmental knowledge among the local people and insufficient conservation financing further increase the fragility of environmental conservation in the Taita Hills cloud forests. Notwithstanding these complexities, there are potential opportunities for positive change such as increasing bottom-up pressure for forest conservation driven by increasing water scarcity, which can be strengthened through the mobilization for international and private funding for nature conservation, and increasing international visibility of local conservation achievements through environmental communication. There are, however, threats to be considered, such as the ongoing agricultural intensifications on riparian areas that cause degradation and impair important migratory routes for the fauna occurring around the Taita Hills forest fragments. The historical injustices and marginalization in resource management and benefit-sharing accompanied by corruption and lack of transparency in resource management, uncontrolled urbanization (Mkaya 2013), rapid land use change (Teucher et al. 2020), and general financial crises (Kavousi et al. 2020) further complicate the urgent restoration of the Taita Hills cloud forest.

CONCLUSIONS
Our study shows that the systematic reluctance to address perceived historical injustices in benefit-sharing and unequal resource management governance recreates a subtle, yet powerful, anti-conservation narrative, reinforces distrust for environmental management agencies, and forges a polarizing environment for meaningful conservation action. As long as local organizations have a very low capacity to act, their relevance tends to be low, and so does their acceptance by the local population. The current situation makes any efficient protection of the last cloud-forest patches of Taita Hills highly difficult.

**Responses to this article can be read online at:**
https://www.ecologyandsociety.org/issues/responses.php/13325

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**Data Availability:**
All data are available as supplementary electronic appendices.

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Appendix 1: Structured questionnaire

Introduction of interviewers

Hello, my name is _____________________________ (-student) and my name is ____________________________ (TUM/Vechta-student). We work for the Taita Taveta University and the TUM University and the University of Vechta in Germany. Some of our colleagues conduct environmental studies in the Taita Hills cloud forests and in the meanwhile we want to find people working or living along the forest, who are willing to answer some questions about their living and work as well as their experiences with the nature. The findings of this research will provide benefits through environmental conservations programs by taking your needs into account.

Would you be willing and do you have about 45 minutes to answer some questions? Your answers and personal information of course will be handled anonymously. You can always ask questions or say additional answers and withdraw at any point of the interview if you feel uncomfortable.

Habari, jina langu ni_____________________________ ( ) na jina langu ni_______________________________(Mwanafunzi wa TUM/Vechta). Sisi ni watafiti wa chuo kikuu cha Taita Taveta University na Chuo cha Ufundi cha Munich, Ujerumani. Tuna watafiti wenzetu ambao wanafanya utafiti wa mazingira katika misitu ya Taita. Tungependa kuhoji baadhi ya wakaazi wa eneo hili. Matokeo ya utafiti huu yatakuwa yenye manufaa katika mikakati ya kuhifadhi mazingira kwa kushirikisha maoni yako kwa ujumla.

Tutashukuru iwapo tutapata muda wako kwa takribani dakika 45 kufanikisha lengo hili. Ujumbe ambao tutapata kwako utakua na usiri kubwa, na iwapo una swali lolote, jisikie huru kuuliza.
PART 1- Socio-demographic data and side conditions

1) Gender

| Jinsia          |   |
|-----------------|---|
| Male            | □ |
| Mwanaume        |   |
| Female          | □ |
| Mwanamke        |   |

2) Ethnic group

| Kabila          |   |
|-----------------|---|
| Taita           |   |
| Taveta          |   |
| Sagala          |   |
| Others          |   |

3) Please indicate your age (only one answer): 
Una umri wa miaka mingapi? (jibu moja tu)

| Age Group |   |
|-----------|---|
| 18-28     | □ |
| 29-39     | □ |
| 40-50     | □ |
| 51-61     | □ |
| > 61      | □ |

4) What is your level of education? (only one answer)
Kiwango chako cha elimu ni? (jibu moja tu)

| Education Level |   |
|-----------------|---|
| None            | □ |
| Sijaenda shule  |   |
| Primary school incomplete | □ |
| Sikumaliza shule ya msingi |   |
| Primary school complete (1-8) KCPE | □ |
| Shule ya msingi (1-8) KCPE |   |
| Secondary school incomplete | □ |
| Sikumaliza shule ya upili |   |
| Secondary school complete (1-4) KCSE | □ |
| Shule ya upili (Kidato cha 1 - 4) KCSE |   |
Tertiary education /vocational training institution (polytechnics etc.)

Higher education (professional training or university)

Other (specify):

5) What is your main source of livelihood?
Je, unajishughulisha na shughuli gani muhimu za mapato?

6) Please indicate your level of income per month (only one answer):
Tafadhali onyesha kiwango chako cha mapato kwa mwezi? (Jibu moja tu)

7) How many children do you have: ______ M.........? F..........?
Una watoto wangapi: waume..............wake..............

9) How many people in total live in your household?
Jumla mnaishi watu wangapi hapa?
(Please explain that the household includes all the people who share common pot/ cook together every day)

10) How many years have you lived in this village? ......................................................
Umeishi kijiji hiki kwa mda gani?

11) Did some of the following persons teach you about indigenous knowledge in the conservation of Taita Hills forest?
Ni nani aliyekufunza kuhusu umuhimu wa hii misitu ya Taita?

| Never kamwe 1 | Rarely nadra 2 | Sometimes Mara nyingine 3 | Often Mara kwa mara 4 | Very often Mara nyingi 5 |
|----------------|----------------|---------------------------|-----------------------|-------------------------|
| Mother Mama    |                |                           |                       |                         |
| Father baba    |                |                           |                       |                         |
| Grandparents mababu | Other family members Wengineo katika familia | Faith Leader Kiongozi wa dini | School teacher mwalimu | Village Elders Mzee wa kijiji | Others wengineo |
|---------------------|-----------------------------------------------|-----------------------------|------------------------|-----------------------------|----------------|

12) In your opinion: How important is indigenous knowledge in the conservation of Taita cloud forests? (Please circle the correct response)

**maarifa ya kitamaduni yana umuhimu gani katika uhifadhi wa misitu ya Taita?**

| No | Little | Neutral | Important | Very important |
|----|--------|---------|-----------|----------------|
| Si muhimu | Muhimu kiasi | Upande wowote | Muhimu | Muhimu sana |
| 1 | 2 | 3 | 4 | 5 |

13) Please explain why:

**Tafadhali eleza kwanini:**






14) If you have children, do you think that it is important for you to teach them the importance of conserving the Taita hills cloud forests? (Please circle the correct response)

**Kama una watoto je, ni muhimu kuwafundisha umuhimu wa kuhifadhi misitu ya Taita? Chagua jibu mwafaka**

| No | Little | Neutral | Important | Very important |
|----|--------|---------|-----------|----------------|
| Si muhimu | Muhimu kiasi | Upande wowote | Muhimu | Muhimu sana |
| 1 | 2 | 3 | 4 | 5 |

15) Please explain why:

**Tafadhali eleza hwanini:**







16) Who do you think should be responsible for teaching your children about the importance of conserving the Taita Cloud Forest?

Kwa mtazamo wako, ni nani ana jukumu la kufundisha watoto umuhimu wa kuhifadhi msitu wa Taita?

- Mother Mama
- Father Baba
- Grandparents Mababu
- Other Family Member Watu wengine (please specify) taja...............................................
- Faith leader Mchungaji wa kijiji
- School Teacher Mwalimu wa shule
- Village Elders Wazee wa vijiji
- Other Wengine (please specify) Taja...........................................................

17) What is your religion

Dini yako ni?

- Christian mkristo
- Muslim muislamu
- Traditional Dini za kitamaduni
- Other Nyingine

18) Does your religion teach about the importance of conserving the environment? (Please circle the correct response)

Dini yako inakufundisha umuhimu wa kuhifadhi mazingira?(Chagua jibu mwafaka)

- Yes/No
- Ndio/La

19) If yes, please explain how:

Kama ndio, eleza kwanini:

........................................................................................................................................
........................................................................................................................................
........................................................................................................................................

PART 3 – Land tenure and use

Sehemu 3 – Umiliki na utumiaji wa mashamba

20) What is the size of the land that you use (acres)?
21) What are the benefits of living/cultivating close to the forest? (Please indicate on a scale from 1 (Not important at all) to 5 (very important) how important the following reasons for living/cultivating close to the forest are):

| Benefit                                                                 | No importance (Hakuna umuhimu) | Little importance (Muhimu kidogo) | Neutral (Upande wowote) | Important (Muhimu) | Very important (Muhimu sana) | Don't know (sijui) |
|------------------------------------------------------------------------|---------------------------------|-----------------------------------|-------------------------|-------------------|-----------------------------|--------------------|
| Good soil for agriculture  
Mchanga wa rotuba nzuri kwa kilimo | □                              | □                                 | □                       | □                 | □                           | □                  |
| Good soil for brick production  
Mchanga mzuri wa kutengeza matofali | □                              | □                                 | □                       | □                 | □                           | □                  |
| Wood availability for construction  
Miti ya kujengea | □                              | □                                 | □                       | □                 | □                           | □                  |
| Wood availability for burning bricks  
Miti mizuri ya kuchoma matofali | □                              | □                                 | □                       | □                 | □                           | □                  |
| Wood availability for charcoal production  
Miti mizuri ya kutengeza makaa | □                              | □                                 | □                       | □                 | □                           | □                  |
| Availability of water  
Maji | □                              | □                                 | □                       | □                 | □                           | □                  |
| Availability of wild animals as food supply  
Nyama ya msituni kama chakula | □                              | □                                 | □                       | □                 | □                           | □                  |
| Availability of shade  
Kivuli | □                              | □                                 | □                       | □                 | □                           | □                  |
| Climate regulation  
(Hali ya hewa)ubaridi | □                              | □                                 | □                       | □                 | □                           | □                  |
22) Are there any endangered plants and animals in this area?

*Wajua kama kuna mimea na wanyama wanao angamia kwenye eneo hili?*

|                | Yes | No | I don’t know |
|----------------|-----|----|--------------|
| **Plants**     |     |    |              |
| **Mimea**      |     |    |              |
| □ which:       |     |    |              |
| **Animals**    |     |    |              |
| **Wanyama**    |     |    |              |
| □ which:       |     |    |              |

23) Are there any plants and animals in this area which only exist here?

*Wajua kama kuna mimea na wanyama wanao patikana kwenye eneo hili peke yake?*

|                | Yes | No | I don’t know |
|----------------|-----|----|--------------|
| **Plants**     |     |    |              |
| **Mimea**      |     |    |              |
| □ which:       |     |    |              |
| **Animals**    |     |    |              |
| **Wanyama**    |     |    |              |
| □ which:       |     |    |              |

24) In your opinion should plants and animals in Taita cloud forests be protected?

*Kwa maoni yako lazima mimea na wanyama walio hatarini kulindwa?*

|                | Yes | No | I don’t know |
|----------------|-----|----|--------------|
| **Plants**     |     |    |              |
| **Mimea**      |     |    |              |
| □               |     |    |              |
| **Animals**    |     |    |              |
| **Wanyama**    |     |    |              |
| □               |     |    |              |

25) How do you get information about environmental laws, rules or regulations? (Multiple answers possible)

*Jinsi gani unapata taarifa kuhusu sheria za kutunza mazingira (Majibu zaidi ya moja inawezekana)*

- Media (radio, newspaper etc.)
26) Please rate the usefulness of the following sources of environmental information:

| Source                                                                 | Very useful | Useful | Neutral | A little useful | Not useful at all |
|-----------------------------------------------------------------------|-------------|--------|---------|----------------|------------------|
| Media (radio, newspaper etc.)                                         |             |        |         |                |                  |
| Vyombo vya habari (radio, magazeti, n.k)                              |             |        |         |                |                  |
| Internet (Website/Facebook…)                                          |             |        |         |                |                  |
| Mitandao                                                              |             |        |         |                |                  |
| Official information (from government or the management of the area)  |             |        |         |                |                  |
| Taarifa rasmi (kutoka kwa serikali au usimamizi wa eneo hili)         |             |        |         |                |                  |
| Non-governmental organisations                                        |             |        |         |                |                  |
| Mashirika                                                             |             |        |         |                |                  |
| Personal communication with friends, neighbors, or family members     |             |        |         |                |                  |
| Mawasiliano ya kibinafsi na marafiki, majirani, au watu wa familia    |             |        |         |                |                  |
| Public meetings                                                       |             |        |         |                |                  |
| Baraza                                                                |             |        |         |                |                  |
| Others, specify:                                                      |             |        |         |                |                  |

Vinginevyo, Taja: ________________
27) Please rate the importance of the Taita hills cloud forests to you personally

Misitu ya Taita una umuhimu gani kwako wewe binafsi?

| No importance | Little Importance | Neutral | Important | Very important |
|---------------|------------------|--------|-----------|---------------|
| Si muhimu     | Muhimu kiasi     | Upande wowote | Muhimu | Muhimu sana |
| 1              | 2                | 3       | 4         | 5             |

28) Please explain why:
Tafadhali eleza kwanini:

..........................................................................................................................
..........................................................................................................................
..........................................................................................................................

29) On a scale from 1 (strongly disagree) to 5 (strongly agree), please indicate how much you agree or disagree with the following statements:

Tafadhali onyesha ni jinsi gani unavyokubaliana au kutokubaliana na sentensi zifuatazo katika viwango vya 1 (sikubali kabisa) hadi 5 (kubali kabisa)

| Soil erosion is a serious problem in Kenya | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Don't know |
|-------------------------------------------|-------------------|----------|---------|-------|----------------|------------|
| Mmomonyoko wa udongo ni shida kubwa nchini Kenya | □                  | □        | □       | □     | □              | □          |
| Soil erosion is a serious problem on my farm | □                  | □        | □       | □     | □              | □          |
| Mmomonyoko wa udongo ni shida kubwa katika shamba langu | □                  | □        | □       | □     | □              | □          |
| Soil fertility/productivity is a serious problem in Kenya | □                  | □        | □       | □     | □              | □          |
| Ukosefu wa rotuba ni shida kubwa nchini Kenya | □                  | □        | □       | □     | □              | □          |
| Soil fertility/productivity is a serious problem on my farm | □                  | □        | □       | □     | □              | □          |
| Ukosefu wa rotuba ni shida kubwa katika shamba langu | □                  | □        | □       | □     | □              | □          |
| Too small fields due to land-splitting is a serious problem in Kenya | □                  | □        | □       | □     | □              | □          |
Mashamba madogo sana kwa sababu ya kugawanya ardhi ni shida kubwa nchini Kenya

Too small fields due to land-splitting is a serious problem for me
Mashamba madogo sana kwa sababu ya kugawanya ardhi ni shida kubwa kwangu

Use of non-indigenous tree species/crops is a serious problem in Kenya
Kupanda miti na mazao yasiyo ya kiasili ni tatizo kubwa nchini Kenya

Use of non-indigenous tree species/crops is a serious problem on my farm
Kupanda miti na mazao yasiyo ya kiasili ni tatizo kubwa katika shamba langu

30) What do you think are the 5 main threats to the Taita hills cloud forests, plants and animals?
Je, kwa mtazamo wako ni tishio gani 5 kubwa kwa wanyama na mimea ya misitu ya Taita?

1).............................................................................................................................

2).............................................................................................................................

3).............................................................................................................................

4).............................................................................................................................

5).............................................................................................................................

31) Who do you think should be in charge of protecting the Taita hills cloud forests?
Kwa mtazamo wako, ni nani mwenye jukumu la kuulinda misitu ya Taita?

The government Serikali

Non – governmental organisations Mashirika

Donors Wafadhali

Local people wanakijiji

32) Do you think that you have a personal responsibility towards the conservation of the Taita hills cloud forests?
Je, kwa mtazamo wako wewe binafsi una jukumu la kuhifadhi misitu ya Taita?
Part 5 – Willingness

Sehemu 5 - Utayari

34) I will now read out some other possibilities of getting personally involved in the protection of nature. Please indicate on a scale from 1 (not willing at all) to 5 (very willing) to what extent are you personally willing to do in order to protect the forest?

Sasa nitakusomea baadhi ya jinsi unaweza kushiriki katika ulinzi wa viumbe hai na mazingira.

Tafadhali onyesha kwa kiwango kutoka 1 (siko tayari kabisa ) hadi 5 (niki kiasi tayari kuliinda msitu) ni kwa kiasi gani wewe binafsi uko tayari kulinda msitu?

| Activity | Not willing at all | Not very willing | Neither – Nor | Somewhat willing | Very willing | Don’t know |
|----------|-------------------|-----------------|--------------|-----------------|-------------|------------|
| Keeping a buffer zone / Unused zone | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Replanting trees | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Plant crops within trees (mixed farming) | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Adopt zero-grazing | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Other, specify: Mengineyo, (Eleza): | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

Part 6 – Habits and behavior

Sehemu 6 - Mazoea na tabia

35) How included are you in making the rules of resource use and conservation in Taita hills cloud forests?

Unahusiswa vipi katika utunzi wa sheria za utumiaji na uhifadhi wa misitu ya Taita?

| Not involved at all | Very few times | Neutral | Sometimes | Actively involved |
|---------------------|----------------|---------|-----------|------------------|
| Upande wowote       |                |         |           |                  |
36) Please explain your answer:
Tafadhali eleza jibu lako:

37) How many forest conservation user groups are you registered in?
Ni makundi mangapi uliyojisajili katika utumiaji wa misitu ya Taita

38) How often do you attend meetings on forest conservation?
Mara ngapi unahudhuria mikutano kuhusu misitu ya Taita?

39) How would you rate the usefulness of the attended meeting?
Mikutano unayohudhuria ina umuhimu gani?

40) Please explain your answer
Tafadhali eleza jibu lako

41) How often do you take firewood from the forest?
Unatafuta kuni mara ngapi msituni?

42) Which alternative livelihood activities are you actively involved in?
Unajihusisha na njia gani mbadala za kujikimu kimaisha?

- Beekeeping Ufugaji wa nyuki
- Ecotourism Utalii wa mazingira
- Tree planting/nurseries Upandaji wa miti
- Medicinal herb collection Madawa ya kienyeji
43) At the very end, we would like to ask you about your personal ideas for protecting the valuable areas better, but at the same time remaining or even improving the situation of the local people?

Mwisho kabisa, tungependa utujulishe maoni yako kuhusu kulinda maeneo ya thamani, na wakati uo huo kuboresha hali ya watu wa hapa?

Thank you very much for your time and your effort! We appreciate it highly.

Asante sana kwa muda wako na juhudi yako! Tunashkuru sana!

S1.2 SEMI-STRUCTURED EXPERT INTERVIEW GUIDE

The interview will take about 30-45 min

Can you please tell me briefly what your job is?

1. To start with, I would like to ask you some general questions:

(a) When you think about Taita Hills Cloud forests, which images come into your mind?
(b) How would you describe the current situation of the Taita Hills Cloud forests?
(c) Describe the extent to which the situation has changed during the last 20 years?
(d) Could you please clarify who is responsible for the different forest fragments especially Fururu, Susu and Chawia? (National government, County government or local communities)

2. Speaking about the interaction of locals with the area of the Taita Hills cloud forests:

(a) What is produced around the Taita Hills Cloud forests? (Please name all the different kind of products that come into your mind, you may name legal and also illegal activities):
(b) Is there or has there been a change in the products coming from the forest during the last years? If yes, what are reasons for this shift?
(c) What are the reasons for the production of these goods (private use/business/...)?
(d) Which natural resources are used for the production of these goods (soil, water, woods, flowers, honey,...)?

3. What kind of ownership on land exists in this area? How secure is the land?

(a) How do you deal with squatters/illegal settlers occupying the land? What is your opinion on this?
4) We heard that there are environmental laws and rules; that regulate the use of forest resources—like e.g. a ban on tree logging, a ban on charcoal burning and a ban on hunting forest animals.
   a) How are these laws enforced?
   b) What is the extent of compliance to these laws by the locals?
   c) To what extent do these laws have negative impacts on the situation of local people?
   d) To what extent do locals know or get information about these laws?
   e) To what extent is there communication about the laws between locals and institutions/government?
   f) If there is any communication, can you please describe how it works?
   g) Do you know of any other existing protection laws or rules that would apply to the area of the Taita Hills cloud forests?

5) To what extent do local people know about the importance of biodiversity, endangered plant and animal species or the services (water, soil, …) that ecosystems provide to them around the area of the Taita Hills Cloud Forests?
   a) What is the extent of awareness among locals and institutions that this area is sensitive and fragile and that its ecosystems can easily be destroyed?
   - locals
   - institutions

6) I would also like to ask you some questions about the management and protection (current/future) of the Taita Hills Cloud forests:
   a) Which institution or administration is responsible for the management (and protection) of the area? How many people work for it?
   b) Does your institution have any role to play in protecting the Taita Hills Cloud forests? If yes, please list the roles.
   c) What is being done in the area to protect the forest-vegetation and the species?
   d) Which of these actions do you consider being successful?
   e) What should be done in the future?

7) What are your personal ideas for protecting the valuable areas better, but at the same time remaining or even improving the situation of the local people?

8) I would like to ask some questions related to religion and indigenous knowledge:
   a) To what extent does your organisation integrate religion in its conservation campaigns?
   b) To what extent and in which way can religion work hand in hand with policy and science in nature conservation?
   c) To what extent does your organisation integrate indigenous knowledge in its conservation campaigns?
   d) To what extent and in which way can indigenous knowledge work hand in hand with policy and science in nature conservation?

9) At the very end, I would like you to comment on the following issues
   a) How does the plantation of eucalyptus trees in forest patches affect their habitat quality?
   b) Why are the old eucalyptus trees not harvested?
   c) Is there an official system of benefit sharing of harvested trees between the government and local people?
   d) Are existing (Community Based Organizations (CBOs) active?
   e) From our field work, we have learnt that local people are reluctant to plant indigenous trees, why is it so?
   f) What are the causes of chronic forest fires in some of the fragments?

10) Do you have any further remarks or questions?
Thank you very!

S1.3 EXPERT INTERVIEWS

Interview no. 1: Nature Kenya, Wundanyi
Interview no. 2: Susu Ndiweni Fururu Community Forest Association
Interview no. 3: Kenya Forestry Research Institute (KEFRI), Ngerenyi
Interview no. 4: Helsinki Research station Wundanyi
Interview no. 5: IRUWA Solar water Heater Taita Hills
Interview no. 6: Ministry of Environment, County Government of Taita-Taveta
Interview no. 7: Chawia Community Forest Association
Interview no. 8: Furaha Womens’ group
Interview no 9: Ecotourism Kidaya, Ngerenyi

Interview 1: Nature Kenya Wundanyi

So basically we are on a project, a program funded from DANIDA it is entitled People Partner With Nature where basically the project is about participatory forest management in general participatory forest management where we are trying to involve the community in forest conservation. You know conservation nowadays must have an element of livelihood because initially people used to talk about conserve, conserve, you are conserving and you are not benefiting from the environment so ours here in Taita is that we promote the participatory approach in conserving the forests because these forests are where the birds we are interested in are staying there are the habitats, so if these forests are conserved then we anticipate that our birds will be safe and alongside doing this in this project of ours we have three it is about three broad thematic areas there is the area of capacity building there is that area of livelihoods and then there is that area of forest management, the forest ACT of 2016. I think it is 2016 that is aah forest conservation and management Act of 2016 we had initial one that is 2005 it has been reviewed requires that a forest whether it is degraded whether it is on a private land whether it is intact must be managed in such a way that is spelt in a management plan so in our project we are also have been supporting forest management plans. The participatory forest management plans for 2 forests that is the Chawia forest and Vuria and we have a draft not draft parse but we the output these are now the management plans where we did we funded we funded these. This is, within here we have thematic areas so this one will be guiding the partnership between the community and these are the county forests and then from here according to the requirement of the Act, the Act requires that after developing this it has to be approved by the authority either if it a county forest by the county government or if it is national forest by KFS (Kenya Forest Service) and now after that there’s the second step of having an agreement between now the community with community and authority where within the agreement we call it forest management agreement it spells out what is expected from the community aspect and what is expected from the authority and then if there are some benefits accruing from the conservation then what percentage will it also defines what percent will go to the community in that agreement if it signed it is binding that somebody can be sued if you breach the agreement so this is the first step we have done on participatory forest management we have developed this we are soon embarking on agreement we are retrained the community so alongside these ones we are doing capacity building. We want to promote that partnership in natural resource management where the community are Incorporated in the management setting such that the management recognizes that there are people partners. Authority that the
government or KFS recognizes the community that they partner in the conservation, so to ensure these we, we have supported the formation of Community Forest Associations we call them we abbreviate CFAs where we have done the capacity building so that they understand what CFA is all about, their roles as CFA members in conservation, responsibilities and rewards if any. We have done that we’ve had like local consulting and training we’ve also promoted the exchange visits, we took sometimes back we took them to Arabuko Sokoke you know Arabuko Sokoke has some history good history in community and conservation we went there for like one week with representatives we have five forest fragments so we took 5, 5 from the 5 forest fragments I think we were almost 30 to Arabuko Sokoke for 1 week that was early this year I think it was early this year. We also took other representatives for an exchange visit, to a training on Community Forest Association by KEFRI in Kitui it was also like 5 days that was this year and we have had a lot and the impact of all these training on now the CFA include the CFAs now understand the need to involve themselves in conservation in conserving the forests. They are also assisting us you know like in this office I’m alone there are assisting us in doing the awareness as part of capacity building they are now like cascading whatever they’ve learnt sharing with the rest of the community so through the barazas the public meetings they convene they organize public meetings through the chief’s office and talk about their forest like Vuria why we need to conserve Chawia forest and the need for the community to join the Community Forest Associations through user groups so it is going to some extent they are up to the task, they have gotten some skills they understand what they are doing so that is the aspect of involving the community in conserving the forest. The second part of our program is on the livelihood so we have been initiating livelihoods on experimental basis the first phase of our program ended last year and we had some extension till March this year so we are in the new phase of the program in the first phase we initiated some projects including not initiating parsee but supporting because they have been ongoing we were engaging in other projects partnering with other groups so we have been up scaling what had already been started so beekeeping we have supported the groups we have like 4, 5 groups 1, 2, 3, 4, 5, 6 we have 6 groups these 6 groups we have procured and delivered 250 beehives and some the …[8:00 not very clear] .that is like they were 10 they were not so many and alongside that we have been doing capacity building on beekeeping we took some representatives from those groups to a 2 weeks training in Baraka Agricultural Training College in Molo 2 weeks training it was funded by our organization and these guys who were trained were to come back and train others they were supposed to be coming back and so that they come teach others I hope they’ve done okay they have done we have been doing bits of monitoring. Other than that one we have also been encouraging I don’t know how to call it encouraging local exchange visits or sharing knowledge from one group to the other like the issues with beekeeping has been with the beetles so like the other group that is in Chawia they were telling us that, okay they are also partnering with other, what do we call it, with other organizations for example the ICIPE so they have been trained and they came up with a method of controlling the beetle like the beehives there is are landing part on the beehives, where the bees land so they were cutting the landing area so that when the beetles come when they get knocked on to the beehive they fall so when there is that landing they don’t fall they fall down and start crawling and get into the hives so they were trying to cut these landing sites to ensure that when they knock themselves from the beehive instead of getting a landing place they fall down so we have been using the same group to train some of our groups to help them do the inspection of beehives we are just we have been encouraging local knowledge transfer or local knowledge exchange yea so but beekeeping in other groups it is not doing very well except for that group that we visited in Chawia

Why?
They have a series of problems: one, beetles; second, I think it could be too cold; third, is their negligence when you compare the other group from Chawia that they are getting income in fact they are getting good money according to them from the beekeeping they are doing regular hive inspection where you regularly open up and check out whether there is a problem within the hive or not so this other group it is as if they are not doing it and I’m not an expert in beekeeping but they are telling us that bees require clean environment so there is a likelihood that these community groups some of the groups they don’t give us, sometimes maybe they lie to us when we ask we usually enquire on a monthly basis how many beehives have colonized how many bees have absconded and we usually ask about how frequently do they go and monitor their beehives they might tell you we have been doing it we have done it and we are doing it like every two weeks but in real sense even after three months. Yea so those could be some contributory factors, the fact that the hives are not clean so they are suppose to be cleaned regularly or you do the inspection, cleaning regularly then the fact that most bees are absconding could be because the hives are not clean or because of the infestation by the beetle or it is too cold because there is a way of aligning or orienting the hives they were taught and probably there those they are also talking about attack by honey birds but I think that is not a major

We have also seen that they don’t have a processing plant anymore, its broken

Yeah they don’t have a processing plant. Its broken in fact they gave us a sample the one that is broken I sent it to our head office in Nairobi. Our head office is based in xxx. And they tried to do a replacement but they could not get the exact one so our organization is thinking of buying the whole system so I think I should be calling to ask them where they’ve reached. That group is soon getting one but it has stayed like almost 1 year.

Yea, and are you working in touch with xxx organisation he has also told me that they are also working to find a replacement

a replacement, mm that’s a a good ninii because if they can get a replacement to buy the same, we can do other things.

I am surprised that you went with KEFRI (KENYA FORESTRY RESEARCH INSTITUTE) to train CFAs (COMMUNITY FOREST ASSOCIATIONS) because KEFRI told us CFAs are highly politicized they are not functioning. It was really nothing good about CFAs around that area from KEFRI.

This area of ours or

The area around Chawia, the KEFRI main office that is up the hill said CFAs are not functioning they are highly politicized

You know we also have politics in conservation so what happens is you know these people just came recently I think It could be this year.

In September 2017

Yea September but we’ve been here since 2013 and I have been working with the CFAs. We have challenges and it is common to all community groups it is common even to all people who are working together challenges are there. Okay, to some extent they are doing some good work but we are also getting challenges from other groups because you find that these CFAs some of them were formed, the concept of CFA came to Taita very late. Those people who were giving information about the need to have Community Forest Associations didn’t deliver it very well. So some members thought that you form a CFA and then you take over the management of the CFA you start cutting, instead of conserving you start cutting the trees and you sell the timber and any other, so that was the notion. So some thought that it would be easier to start milking benefits from the forest because there was a planned harvesting of mature eucalyptus from the Taita hills. So whoever was giving them information, just to entice them so that they can get into community groups, or get into CFA was that form the CFA then after forming the CFA the when the felling plan takes effect you will be benefitting so that is the
That concept was poorly delivered to the community. That is what we are struggling with. In fact there is a better CFA we are seeing that is fairly picking up but still there are some few problems from the Vuria because it is a CFA that as Nature Kenya we’ve built its capacity. Yea they have even done election, we’ve overseen their election it was successful. And at the end of the election it was more intact because we as an organization you know we are playing a neutral ground. We ensured that, because the forest is surrounded by 6 villages or sub locations, we ensured that within that the executive committee each sub location is represented and we ensured that fairest way because each and every sub location produced like 4 delegates. The initial plan was that they were supposed to have 7 delegates and when they came there was a sub location represented by 4. So we wanted to have a fair play, such that if you win you are winning because you’ve maybe presented your policies and people are happy with them. So the other challenge is, it’s not that they are politicized what we have is that when the concept came it was poorly delivered after the delivery, you know these things come with projects, maybe you have a 3 year project then you’ve delivered the concept poorly and then your project expires and you go away. Speaking of poor delivery, a lot of people in Chawia, most of people we interviewed told us now we are given the forest the forest will become a community forest. That is misinformation. Yea so maybe you should start correcting that. Yes, we’ve also realized that our CFAs trying to create awareness they deliver wrong information to the rest of the community. I have a case example there is a Community Forest Association close to Ngerenyi University, it is called Sundifu. Susu, is a small indigenous forest closer to the polytechnic and then we have Fururu closer to university and then we have the other one closer to the hill is basically a eucalyptus closer to a primary school known as Vichwala. So they are doing awareness and trying to recruiting more members into their group so recently they gave me you know they give me the progress of their activities so they were telling me that this group is complaining they have overgrown seedlings they are waiting for us to go and buy then I asked them, excuse me where did we agree with you people to go while recruiting the groups you tell them that we will be buying the seedlings and yet we don’t have that in our program. That’s what we have been told. They are waiting for you to buy. Yes, those are some of the challenges facing the livelihoods that have been initiated and that is now a challenge that is hard to eradicate. A challenge that after doing everything then some sit and tell you now we have done it, so what next. You’ve given you’ve capacity built a group in a given livelihood you’ve even supported the initiation of a livelihood then after the fruits have started coming then they wait for you to come and either buy or help them go sell. You support community group with cabbages for example so that they have something that can take a shorter time to start earning as they wait for example the bee honey production or as they wait for fish farming. And do you make this clear maybe in the initial, that you will not be the end buyer. You know where the problem is, at the moment we have our own project. Initially the project that got me here initially I was working with Kenya Wildlife Service Research in XXX. So when I came here in XXX then we were affiliated with other groups. There is a group we are sharing office with. So it was a project and our role was specific, implementing a specific part of the project and the bigger portion of the project was being implemented by the other group. Initially there was another one that was funded by CDTF to the tune of 30 million. So we were also partners so when we come we are building on what is existing so in doing this we have realized there are some mistakes that occurred at the initial stages because you find that some of the projects, first one the CDTF project had a provision for buying seedlings from the community. That was one. Another one which now gave me job from xxx funded by Darwin
Initiative had that provision for procuring, purchasing the seedlings from the community. Now those other 2 projects their time elapsed so we have ours which is a program, first phase has gone, we are in the second phase there is no provision for buying the seedlings unless a community group does a proposal to us that requests some funds to buy some seedlings to rehabilitate a portion then they can be given some cash like we did. There is a group on the other side, a Community Forest Association from Vuria was given some 20 thousand based on what they wanted to buy seedlings from their user group and plant there is another group that was given 45, I think they wanted to plant 1500. Yea so unless they do that usually we are trying to, you know working with the community is very difficult we are trying to capacity build, one and then to expand their thinking like opportunities which area available in the devolved system of governance like for example I was just speaking to the group we are working with that there is need for them to do a proposal we can help them to do a very simplified proposal to CDF such that maybe to procure seedlings then they identify where they want to plant the seedlings then if they get the money they take this money and buy their own seedlings they take the seedlings they go and plant and they remain with the money, that is how it is... that is how our organization does but we don’t have allocation for procuring seedlings we are only encouraging them we are only opening their minds on available opportunities to benefit including creating linkages to the county government through ministry of environment we have done that, we have even brought our groups together with the ministry of environment so that they could share, telling the ministry they are able to do this and that. We also work with Kenya Forest Service if we hear that they need seedlings we can direct them or if a donor comes who needs some specific seedlings we direct them but we don’t have that opportunity to go and procure, to go and buy the seedlings

*Tera has told me he wants to buy 4 thousand*

Yea Tera did it, Tera did it last time and they got from the groups working with. You know our groups are widespread. You didn’t reach Ngangao forest and then Vuria?

*Vuria yea*

You’ve reached

*But we have not done research, I just went to walk*

Vuria, we have groups, Vuria there is a side called Mrughua, Mrange Dawida, and the other side called Mwanda. So we usually encourage them, some groups have benefitted by the way through the linkages we are encouraging them to create working linkages. We are also encouraging them to be on lookout for emerging, forming more partner groups like the Tera has been training some of our groups I was also forgetting the need to talk with them so that we agree with them on now they will be having a project, starting in September, it was supposed to start in September but I think it is almost rolling out that goes out for 4 years. I will seek audience with them to know which are there areas of focus, the coverage the areas not the thematic but the areas and then in any case if they will be working some of the groups we are working with is the agreement they can do what they want to do, and and where they will not do we pick from there not duplicating for example maybe they are encouraging A,B,C,D or they want to train on this and we are also planning to train on this, so we can allow them to train on the other one and then we pick form where they will reach, that is what we are thinking.

*And I’m also surprised that that from literature we have been reading that Taita has participatory I don’t know from since when, that’s the whole idea that we came here to study participatory management, but when we came here we were told the stakeholders are just formulating the policy for participatory management so it’s like in theory in real sense it didn’t exist*

I think there is an example of a Community Forest Association which I have heard that they were doing very well from the Taveta I think it is known as either Kitobo

*Taveta down*
Yea Taveta down, Kitobo

But not on these fragments

That is the truth, the concept came late and when it came, you know the problem with these projects come with the concept and the project elapses after 3 years so you push it you reach at a point the project has elapsed and you don’t have any other project. So you leave it that point. So those are some of the things which are and whatever you are told I think it is the truth and that is why as Nature Kenya as an organization we are thinking of, we want it to work and this is an example, we had formulated this, we wanted this to go to county government they sign it we enter into the agreement from there so we have a binding thing we want to experiment it with 2, okay what we want to see is that community taking that initiative of conserving their forests and if there are some benefits accruing from the conservation it also goes the benefit goes to the community through the Community Forest Association so we are also doing experiment and we hope in the 3 years we have, we want to have at least 2 or 3 examples where we will be saying we’ve gone, I have an example, around Fururu there is a CFA we abbreviate it SUNDIFU (susu, ndimbenyi, fururu forests) there is another one from here Iyale forest, we abbreviate it IYAWEMBI that is Iyale, Wesu on the small rock and then there is the other side Mbimbi, that is IYAWEMBI and then the SUNDIFU, Susu, Fururu and Ndimbenyi. Those forests have their management plans approved by Kenya Forest Service, the second stage was supposed to be formulation of the management plan between the Kenya Forest Service and the CFA because those are national forests. The project ended so nobody took up the initiative we tried and initiated the initial process of the agreement which requires the CFA to notify the Kenya Forest Service that they have done the management plan and now they are requesting the initiation of the management agreement and then the project ended the letter was sent, either it didn’t reach Nairobi it disappeared somewhere because we sent some person who is at the headquarter to confirm whether that letter reached, it didn’t reach so we didn’t have again, we have been relying on, we wanted KFS to help those 2 CFAs to start up the process of writing the agreement and again we wanted to ask, we’ve not asked but we wanted to ask KFS is it possible backdating pushing the date forward for implementation because it has not been implemented it was initiated in 2016 it was approved in 2016 but no implementation but to an extent there are activities that are ongoing supported by different organization such that when you read through the management plan you will realize that they are being implemented And perhaps since you came here in 2013/2014 until now the situation you found on this fragment is it the same or have you made an impact or has anything changed

Umm okay before answering that question I said that our project has been on participatory forest management we also talked about the aspect of livelihoods the aspect of advocacy I think the aspect of advocacy and capacity building so we’ve also been having an element of a school outreach program to integrate the awareness with the aspect of environment, public awareness. We also been having the element of involving the young ones in environmental conservation, so you are asking the impact? I is on these plans we have developed these plans and it has cost us a lot of money bringing the experts together, community groups together

So this is your initiative?

Yea this is our initiative

The same document that KEFRI, Kenya Wildlife Works the all contributed to this?

No they were not part of it, KEFRI was not here, KFS was here, county government was here, Community Forest Association plus a consultant so we brought those guys on board and we spelt, we had the document so this is one of our output, the second output t I show you something the second output is this the implementation is ongoing

You got this up there?

Yes this was funded I think the..[not clear] is still here one of our partners this project the one initial project whose implementation is ongoing seriously ongoing
Okay, talking of these we have found through our research people are quite aware of endangered plant species and all these trees but they are not aware about birds or any animals that are living in that forest or do not have a very ecocentric attitude towards the animals, could you know why?

You know again I said that when you are working with community it is very difficult to work with them because, you know you cannot force someone to bind into your idea of conservation but then generally this is how we work even if you walk around those areas of our operation you will hear some people say that that organization only benefit few people. There was a time we heard like that. Only benefit a few people why we don’t work with everybody we work with people in groups and these groups at different areas we have the sub groups, the groups like maybe can be forest user groups, self help groups, we work with self help groups so these self help groups were brought together through an umbrella body known as …[33:58 not clear]

so ours our site support is called Dawida biodiversity group in short it is DABIGO this group has between 10 to 13 CBOs (Community Based Organisation) within itself spread from Ngangao to Virua to Chawia, Susu, Fururu to Iyale so we work with these groups so we work with these groups to help achieve our goal of conservation bearing in mind working with small group they will also impact on the rest of the community but now if you start talking again on the same same if you talk with Tera here the Helsinki guys here not talking with them but if you ask those who are within their area of operation they will even tell you they don’t know what those guys are doing yea that’s what you will get it because somebody selects what he or she wants to hear but generally awareness has being done generally it has been done the area of coverage is big. We are working with 15 schools secondary are few either 1 or 2 but majority are primary we work with Mazola primary it is closer to Chawia these Jikos, the boilers of secondary we bought them and it was to reduce pressure on firewood, cut down the firewood consumption by almost 50% we supported another school known as Vichwala. Have you been to Vichwala, yes Vichwala there is a Jiko, our jiko is there we supported a school here called Kungu, Kungwi is on your way up, on your way up you will get Kungwi we have our signpost is there we supported that school loser to the forest so when somebody tells you aim of supporting this because of these 2 birds they stay in the forest and their numbers are dwindling, they are undergoing local extinction they are disappearing in the forest which they were found, so among things which are contributing to their disappearance, habitat disturbance, that could be cutting down trees for firewood and any other, walking aimlessly in the forest so we have tried to reduce but we have also talked. You know these birds you don’t, even they are not known in the local dialect and these are forest dwelling birds. So it need

Why are they not known?

They are forest dwelling birds wako ndani ya [they are inside] forest they are not common outside so even if you tell someone about these Taita apalis there number is less than 200, not even 200 is between 150-200 but telling a person about these birds you need to go to Virua you may be lucky to see they are fairly abundant in Virua in Iyale they are very few in fact today we are lucky to sight kuskia wakilia wawili [to hear 2 cry] this one and also one of us, this one we are just doing other things so we have done awareness and maybe what we have not done is gauging we have bits of gauging the impact but when we gauge the impact of awareness it usually fairly positive but again you know data is affected by the sample size. Yea

Okay maybe what are you doing about eucalyptus plantation that also affects their habitat quality?

1, I have been in talks with Kenya Forest Service from the headquarters and the local level to at least those areas where these species are found they reduce, they cut not cutting but replacing the eucalyptus with indigenous you know these birds are found in indigenous forests so that is what we have been doing and the impact of that is that KFS agreed and there is a project that is ongoing, and we have affiliated ourselves with museums of Kenya. Iyale forest
there is an area that got burnt so were allowed through our collaborators we convinced them that these birds require that indigenous, so we wanted to remove the burnt exotic trees and leaving the area just open that way to allow natural re-growth

And the fern will not take advantage

So that will be a challenge, that could be a challenge but again it is fine these birds nests on fern they are not selective on what they nest on, this one including Taita white eye, nests on fern so we have like in Ngangao there is a sampling plot that [nini] what was fallen, eucalyptus and pine were cut some sizable area so some monitoring work is going on, on how there is how regeneration is occurring natural growth and whether these species are spreading their territory towards the area that was cut open so that is the far we have gone and as an organization we have been lobbying from Nairobi for the indigenous forest be managed by Kenya Wildlife Service[KWS] because we have realized that those indigenous forests are homes to some unique biodiversity

And why is there no KWS here in Wundanyi office, or is there?

You know with Kenya Wildlife Service is more or else the big animals are you aware of that? Yes

So because we don’t have those big animals they are not aware that we have unique species of birds that are only found here I wonder if they know unless if they heard being named in meetings something like that

And why are the old eucalyptus trees not harvested?

Ummm, there was a plan that was developed known as the felling plan by Kenya Forest Service and then politics came. Politics is a very dangerous game, it started, local politicians started saying oo you see your trees outsiders want to come and benefit from your trees you are stupid you the Taitas you are stupid things like that so politics came and then the Kenya Forest Service had to suspend, to suspend the whole issue of implementing felling plan, within the felling plan they had plans of like where they have matured doing the harvesting and then think of whether replacing the eucalyptus with the semi-eucalyptus or leaving. There had a very good plan whereby some parts of the forest were to some forests were to remain just indigenous they just harvest and allow it to remain indigenous they have the management plan for that

And maybe have they come up with an official benefit sharing system?

With?

With the community to remove the politics, if they say the government gets much and as much goes to the community

You know KFS is government and a government will not come and tell you that and give you an idea of how to eat into their profit, they will not come and tell you and who is a community in the first place?

The citizens of the government

So how will you have a benefit sharing mechanism with the citizen, who is this citizen It’s just like saying the government the government the president, no, because you will hear the president saying government will deal with that, government, government. A minister will say that the government is targeting the minister then you ask who is the government, is not known.

So it is the same. When we talk about the citizens whatever the only thing that can happen is what we are doing now having a management plan and then from there you have the agreement that is signed and then people start working so on the agreement revenue like for example if the felling plan will take effect then you agree as a CFA, a CFA can even register being a saw miller then they are given a percentage that if they are doing the felling then this percentage the CFA will be given this percentage if you fell, you fell and then you rehabilitate you see, so we have not reached there

And from our fieldwork we have learnt that people are reluctant to plant indigenous trees do you know why?
It takes too long to grow to mature again they don’t regard it as economical, it’s not economical according to the returns you know it takes too long to mature and then after taking too long compared to exotic trees they are growing very fast so you start harvesting in time and you start enjoying the benefits of your hard work like for example the Prunus africana it can take 2 years and it is here

And they also talk about the logging ban because even if they plant indigenous trees they will never be allowed to cut them so they say it’s better we plan the exotic trees because we can have a permit to cut them so perhaps the logging ban is counterproductive in that sense

Maybe

And what are the causes of chronic fires in some of the fragments

Okay from the hearsay some believe that during the drought when you want the rain to come quickly you burn, maybe it is biologically proven it works but it is not sustainable so they are burning, the smoke itself you know smoke is moisture from the burning vegetables, it goes into the air get cooled and then come down in the form of rain

And do you work with religious organizations or indigenous dini za kienyeji [traditional religion]

No

And last question, what are your personal ideas for protecting the forest but at the same time improving local livelihoods, your personal

My personal, If you had the power

If I had the power you know when you tell a community member that conserve, protect do this do what the forest benefit, community want to see tangible benefits not inherent like ecological services bla, bla. They want to see, in fact community member wants to feel that because of this forest my child is going to school, because of this forest I have eaten my supper, have this money because of this forest so personally if I’m in the authority assume county government I would advocate for strong partnership between Community Forest Association and the government and I would also develop the revenue benefit sharing mechanism such that outside the conservation work that the community will be doing, if they is something good from it then, I would ensure there is a good percentage going back to the community you know I have been telling the community members that these forests do not even belong to Kenya Forest Service, Kenya Forest Service they do conservation and management on behalf of like here in Taita on behalf of people of Taita, the forests were there before KFS was formed, forest were there and they will only support that conservation, you know when you talk about that they will tell you this forest ni ya serikali, nyani pia inatoka hapa [belongs to the government and monkeys live there] come and destroy our crops so the best conservation initiative is that which strikes a balance between, that ensures the wellbeing improves the wellbeing of people improves and conservation, biodiversity improves so for you to ensure that you have achieved this, you have done bits of conservation you need to look at the social welfare of the people and also the welfare of the biodiversity

What is your idea of controlling human wildlife conflict especially with monkeys and baboons?

The greatest contributor towards human wildlife conflict are the humans themselves because you are a human being you have gone and cultivated closer to the forest the monkeys will see your farmland as the easy way out to go and feed same like Taita county as a whole the issues to do with elephant human conflict it is on the rise, why because we have gone and stayed within their corridors, migratory corridors so when these elephants come, maybe more from the other side to get water its traditional water the area there then it gets the area is locked will this animal spare you, it will just move so we are pushing, the human beings we are pushing too much or too hard on the wildlife and so because of that push, they are hitting back. We are squeezing them
And does insecure land tenure in the area affect what you do like in Chawia we didn’t see anyone with a title deed

I think titles are not here in the hills, they are not here

Do you think they would improve the situation?

If, they have that legal document in which sense

In conservation sense such that people will invest in their land more because like grandchildren say ni shamba ya babu [the land belongs to my grandfather] so they have no motivation to plant trees on their farm or anything to invest intensively so perhaps if they could have a secure land tenure they would invest more on their farms and remove pressure from the forest

Maybe, you have even made me remember something to add on what I would do I would also encourage the payment, is it called payment for ecosystem services such that those who are on the lowlands pay for the services from the hills and these people from the hills will feel the urge maybe to conserve the water catchments may feel the urge to up their further their environment up here is conserved because water like the Voi River comes from up here I think these are tributaries up here. So the issue on land ownership is very tricky. You know I think what we need urgently for example here in Taita or the areas with fragile ecosystems are land use plans such that it is in the government laws whatever or policies that if you are to plant like you were saying some people are for exotic, then there are areas where you are not allowed to plant exotic and some area you can be allowed to plant exotic even if you do subdivision of land there are areas that need more so the water catchment areas whether it is on your land or not on your land it must remain protected for the issues of water

And do you think there is hope for conservation or we are going to lose it

Yea this one we are worried whether it will survive because the number is dwindling. Hopes. Okay, despite the challenges, hopes only come because of the effort that has been put so based on the efforts that are in place we just hope that things will turn around well. For example we’ll secure the habitat for this. We are leasing land the side of Vuria we have 6 hectares already leased for 25 years for the conservation on a private land so these birds were found to be there their nesting ground were being destroyed by fire somebody could just burn to open forest for farming, so we as an organization planning to create a reserve forest reserve for these birds secured so for these birds to some extent hopes are there we are also pushing hard for the county government recently we formulated forest policy and when the right time comes for formulating the regulation, policy goes with regulation we will also push for, ensuring that the fragile areas are mapped and maybe stringent measures are put in place to ensure that if for example your shamba there is a strip passing through your shamba then we will ensure that we put some close that say …or to reinforce the existing laws like on protection, you see so a lot of research is going on the hills and we just hope are also pushing county government to take a lead such that these research work that are being done like you people after finishing we need to have the report and the stakeholders and the community are made aware of the status of their environment what is on-going so if that one is done then a lot of awareness will be created. People will see the trend, yea when we talk about this bird is disappearing they will be seeing you see to some extent we have hope and that is what is driving us we have not given up hopes are there. Together with having these strong Community Forest Associations we’ll be having a strong Community Forest Association and we are optimistic that other groups, other people will come from other areas to come and benchmark on how it was done here. Yea there is some hope

Asante sana [thank you very much]
Karibu [welcome]
Chawucha [thank you]
[…not clear] …THE END
Interview 2: Susu Ndiweni Fururu Community Forest Association

To start with, I would like to ask you some general questions:

When you think about Taita Hills Cloud forests, which images come into your mind?
(Spontaneously: Please name both positive and negative aspects.)

- We want to conserve it and we want to rehabilitate it, because it was destroyed. It is no longer indigenous.
- But in reality, we have to restore the forests as previous. There is a need to remove the eucalyptus for indigenous trees. That is the major point of us.
- We have our constitution and our objectives here:
  “The SuNdiFu CFA shall ensure, that is the aim, that since much of the forest and the wetland resources have been destroyed by human activities. Fururu encroachment, SuNdiFu will provide the community with all they need to stop their negative attitude and make positive changes by conducting regular awareness meetings.”

How would you describe the current situation of the Taita Hills Cloud forests? (Considering interaction of nature/ locals/ government)?

- Destroyed. The forest is destroyed.
- Due to encroachments, firebreaks, illegal logging, there are so many destructions.
- From Its original way, it was a cultural, before then.

Describe the extent to which the situation has changed during the last 20 years?

- There is an infinite number of changes, especially the forest cover has been encroached a lot. Movement, flow of water, as it was previously covered, it is not longer existing.

Could you please clarify who is responsible for the different forest fragments especially Fururu, Susu and Chawia? (National government, County government or local communities)

- Now for us, they are gazetted. So, we are barely under casual ways. The three forest fragments are government gazetted. Chawia is still under County government.

Speaking about the interaction of locals with the area of the Taita Hills cloud forests:

What is produced around the Taita Hills Cloud forests? (Please name all the different kind of products that come into your mind, you may name legal and also illegal activities):

- They do bee keeping
- Now, as you know, the forest was completely under governmental control, years ago. They were used to protect it, they used to conserve it, but when it was gazetted, the people got very disappointed, because then the attitude changed. The government came into the forest, the people were no longer allow to take dry and dead wood out of the forest, so they burned it. They wanted anymore to step into that forest and the people thought, now it is lost. It is now lost from them. So they had a bad attitude actually. They said: “Now we don’t care about it.”, “Let the government now protect it.”, “Let the government now improve it.”. And they didn’t improve it. Instead they started corruption, they started logging. And due to that it was destroyed. So, if you ask me about the people, they don’t get anything from the forest, they lost. So that’s why they are bitter. That’s why fire has started in the forest.

In fact they hated it to be associated with the forest, because they didn’t get firewood, they didn’t get anything they wanted, they didn’t get grass, it was burned, nobody was going in. There were no, like firebreaks, to protect the forest. But I putted it there an I am telling them they need to use the rocks.

But they know the forest is a source of water catchment. I think they understand, that the forest is good for them.
Is there or has there been a change in the products coming from the forest during the last 918 years? If yes, what are reasons for this shift?

- We are supposed to benefit, but we don’t extract medicinal herbs from the forest. And after all, in the forest, when they were indigenous, I know, our people were used to the medicine from the forest. But now, after gazettement, they don’t get that medicine from there.

Butterflies

- There are some birds, which can only be found here in this forest, not anywhere else in the world. There is the white eyed, it is a Taita bird.

What kind of ownership on land exists in this area? How secure is the land?

How do you deal with squatters/illegal settlers occupying the land? What is your opinion on this?

- It is private land, because the land is demarcated, and we all have titles.

- Authority for the land is the ministry of land.

- Land control body

- Previous we had this problem. There was a lot of illegal settlements but now, everything is titled.

We heard that there are environmental laws and rules; that regulate the use of forest resources- like e.g. a ban on tree logging, a ban on charcoal burning and a ban on hunting forest animals.

How are these laws enforced?

- These laws are enforced by Kenyan Forest Services (KFS)

- Environment and natural resources

- If I wanted to harvest, like I recently did, I harvested, I cannot harvest just without the knowledge of county government and the ministry of KFS and the ministry of environment and natural resources. The county government is now authorized to give the permits.

- Let me just indicate: First we have to get permission from the area chief, you have to see your warden administrator, constitution of warden administrator. Then from there you have to go to forest department, to get permitted to harvest on your land and to log trees. This is the procedure.

- The community, they have to go the village councilor. This councilor is the first person who educes the permit, that this man really owns the trees. We go to that chief. Than from there we go to the warden administrator. Then we go to sub county forest administration. Actually we are talking about the district, because there are changes, we don’t have a provisional government, we don’t have district officers. What we do have now, is county commissioners. They are there. And you have to do all this every time you want to harvest. Normally this process took sabota week.

What is the extent of compliance to these laws by the locals?

- When I want to harvest on my land, I can’t just harvest without that knowledge of county government, ministry of environmental and natural resources, that is the one who give us the permits to harvest.

To what extent do these laws have negative impacts on the situation of local people?

- This procedure is good! If everybody would be allowed to harvest without a permit, desertification would occur. It is also meant for conservation. […] You can see how many local people do replant.

To what extent is there communication about the laws between locals and institutions/government?

- Well, this is an exactly association thing, this is what we do. This wasn’t there since forever. This is new. That allowed the communities to participate in forest management. And this is
why we founded this association. Now, what we are saying is that, it is going to change. Much has been given to the community now. Why? Because the government now has seen, once thy had gazette that forest […], but now this one turns different. What were they doing? They were logging, selling the logs and getting money for themselves […].

- But now, things have changed. From now, when we started to manage the forest together (KFS, the county forest officers and the association). So when they get 600KSh from researchers for the fees, those funds should be actually shared.

If there is any communication, can you please describe how it works?

- For example, we share the share the forest management plan content with the community and inform them about all the changes. We are sensitizing the book.

- The forest act 2005 has given them authority to participate in the forest management.

Do you know of any other existing protection laws or rules that would apply to the area of the Taita Hills cloud forests?

- Soon we will go to sign an agreement together with the county government and KFS. It is about how we want to manage and use the forest. And for your information, this comes from us now.

- We have a book. A forest management plan and we were authorized to participate, what we did. This forest management plan is unique.

To what extent do local people know about the importance of biodiversity, endangered plant and animal species or the services (water, soil, …) that ecosystems provide to them around the area of the Taita Hills Cloud forests?

What is the extent of awareness among locals and institutions that this area is sensitive and fragile and that its ecosystems can easily be destroyed?

- locals: They are aware! They are aware of what is changing. They are well informed They causing what is happening. They are to ones, who talk about it.

[Long speech about himself and how important he is to the other villagers. At least he assumes that.]

- I went to another course in Nanyuki.

- I have told the people a lot about climate change. I am a member of a climate change adoption program. We were working with a lot of people (ICIPE, Finland University, and a lot more)

- We have ISGTP Kenya: International Small Groups Tree Planting Program

When I came from there, it was my job to educate the people here

[Again a long self promoting speech]

- institutions

I would also like to ask you some questions about the management and protection (current/future) of the Taita Hills Cloud forests:

What is being done in the area to protect the forest-vegetation and the species?

- I teach them about organic farming, replanting trees, planting fruit trees, how to farm, how to act

What should be done in the future?

- SuNdifu Association will work due to the established workplan 2018. Firstly to map the forest. Realizing that the forest boundaries and the adjusted farms are unmarked. We will give these activities the first priority, to avoid forest-farmers conflicts and encroachment problems.

Secondly, firebreaks and clearing and marking. Number three: Construction of fences. Forest control groups. Number five: Enable and entangle the different committees. Number six: Infrastructure. We don’t have roads. The people see the need of access roads, e.g. for fire fighters and also for ecotourism. Number 7: Utilization of user groups. We should utilize workforce and we should get it from the user groups. That is what we are doing now, we are sanitizing them, to be ready, when work comes, in the forest. They will do all these jobs. The communities will do this through user groups. They will be allowed to keep their behaves. E.
g. Bee keeping is coming now, as well as butterflies. Tree nursery groups. Herbal medicine groups. There are trees, able to cure cancer. Researching groups. Cultural knowledge groups.

**I would like to ask some questions related to religion and indigenous knowledge:**

To what extent does your organization integrate religion in its conservation campaigns?

- We have to integrate it, because there are different groups with different interests and diverse religions. There are the ones who want to keep the forest holy, to close the forest, so that nobody can enter it.

- We want to keep the caves, for sure, but the main aim is to keep the fragments together, to keep all the different interests and religions and cultures together with the indigenous knowledge.

- There are still cultural forests: Ndiweni and Fururu

To what extent and in which way can indigenous knowledge work hand in hand with policy and science in nature conservation?

- It is important! We already had some studies about the religion with the researches from Finland. It is really important! Traditional religion plays a major role. The people need to be aware of the carves, so that they will not longer destroyed. The areas and the caves need to be protected!

- The problem with our culture here is that it automatically has changed. We are not much in traditional religion. People have to pray, because it is their faith.

[A long speech about their own behavior and use of their private religion and an experience with the researchers from Finland and how their praying brought rain...]

At the very end, I would like you to comment on the following issues

How does the plantation of eucalyptus trees in forest patches affect their habitat quality?

- These trees, you know? These trees, eucalyptus has been really harvested, because the people were told, that the eucalyptus is dangerous to water. Now, there came people, they said due to their data, you have a good eucalyptus forest. But they were told, that they are useless, they drain your land, just put them away. So, the people gave their property, almost without, I mean with a throw-away-price. And now, the people are dying of poverty, because they have harvested their eucalyptus trees, at least they have let other people from other places. I am not deciding (?) anybody. But that is, what they have done. They confused the people from the Taitas. They have harvested the eucalyptus trees, went away and now, the Taitas have to plant other trees. So, I think you’re understanding me why. And when we went to Florenz (?), these was, prayed us to plant eucalyptus trees. And I know myself, I have harvested these trees, I’ve got eucalyptus trees by the way, my forest is eucalyptus. I was an enemy of the people. They were saying: “You see, you are keeping your forest here, your eucalyptus forest is drying our water and is doing what what!” I told them, okay, but your aim is not in the river, it is in my land. You see, you can not interfere with mine. But I has been told, harvest it, harvest it quickly, they are dangerous to water and what what. And when we went to forest, we went to Florenz (?) it is, what is said, to be a very good tree, as far as even, ecology’s concern. So, I was thinking of asking about it. There is no problem with eucalyptus, we have just been told to plant it far away from the water catchment. You cannot plant it in the water catchment. But in our farms, we plant them. You get timber, firewood and it is the one you use to produce tea by the way. So how could they say it should not be grown? And they themselves from up the country come and take our treed, because this species, the Taita species, the Taita eucalyptus, is very good.

It is not like other areas, when you go upcountry, the eucalyptus is not good, for timber even and for round boles but here it is very good.

- But in the forest, it affects the indigenous habitats. We mean, in the forest, it should not be planted. It kills indigenous. When you take a look from where you are staying, you can see
how it has spread, now they are even finishing the indigenous forest. That is why we want to remove it and plant our indigenous trees.

Why are the old eucalyptus trees not harvested?

- First of all, there where the university is now, was a big forest. What there was done, the people use to say, they own the trees in the forest. During the harvest, it was done illegally. By the way, with the collaboration, some people, talked to somebody, when they came and harvested all the trees. And this brought a lot of conflicts. To the people and the community and the government and even the institution, because they harvested and the community didn’t get anything. Now, myself, when I was been given the chances to forarms, I talked about these forest as a eucalyptus forest. What did they want? They wanted to harvest. And now, the officers, who are here in Ngerenyi, the other previous years, the district commissioner, they cutted trees. See? And they left. After harvesting, the y left. They went away. Now, they had the plan to harvest these trees, so they came. But I was one of the ones who were asked about it. And I thought about, I was now given authority, to take part of it. So, I said, these trees will not be harvested. Okay, they can harvest, but now, they did it illegally, because we as an association now, we should be told, we should have signed an agreement or leaven the trees, so that the community get their share.

- So, why they have not been harvested, is about the conflict of interest. Because, they wanted to harvest, but we were there, said you cannot harvest, unless we know, unless we got invited, the community get their share, the county get their share.

- We should be included. We should be given a share. So I don’t know, what they want to do now. They stopped.

- If you want to restore the forest, you need to remove them. In fact, we want to reverse the forest to indigenous. So, they have to be harvested. And if they will not be harvested, they lose value

Is there an official system of benefit sharing of harvested trees between the government and local people?

- No, at the moment it is not there, but we want to implement it.

Are existing (Community Based Organizations (CBOs) active?

- Right now, we have like three in this area.

From our field work, we have learnt that local people are reluctant to plant indigenous trees, why is it so?

- In their farms? The indigenous? They don’t plant them! Because they have tested timber from exotic trees. You know, indigenous takes too long to mature for timber. For them it takes 60 years, but for eucalyptus it takes and Grevilliea, all those exotics, it takes 15 years. So people like to plant them. You cannot tell them to plant indigenous, but for river areas, they should plant indigenous.

What are the causes of chronic forest fires in some of the fragments?

- Okay, it can be an accident, where a farmer is maybe burning grass and then the fire spreads into the forest. Or there is arsonist, this people who like, cause my forest was burned, this was a arsonist. And you know, I told you, the people don’t care anymore if the forests are burning, because they are not using the forest. Now we are sensitizing them, they should not burn the forest. Because they are gonna be beneficial to them.

- The forests provide lots of water.

You are facing this fragmentation due to the subdivision of land. How do you perceive the pressure on land in the Taita Hills, regarding this topic of fragmentation?

- Well, according to land tenure with us, it started long ago in 1966. Most of our farmers are now reducing due to our population. So, as time goes by, we don’t have land anymore, because we shared it with our children and grandchildren. So, what we further requested with our
government currently, there is a need, if possible, we plant more trees here, to reserve water, so that the bare areas, burned areas, them we can transfer and keep them for water catchments in future. We don’t know, how many years to go.

*Another question on ownership of land: Where is the perception on ownership? Are, e.g. women allowed to own land?*

- Well, for now, it is allowed. But previously, no women could own land. And now, we are practicing it, it is accepted.

*I was wondering about the different relationships between the human-beings here with plants and animals. Because they seem to be really different, for my opinion. What do you think about it? Do the people here, the locals, have a different relationship with plants as with animals?*

- Simply because we are farmers, we normally like temp animals. They are life-sustaining for us, especially cows, goats. Surely, you cannot do without. So, those animals who become destructive, like monkey, thrikes (?), baboons, some like so, they are those that were born to be in those areas where at least where the settings are for foreigners to come, like you, and to keep the distance. They are those animals, not allowed to come up.

*Does it also depends on the knowledge? Because for my opinion, the people know a lot about plants and trees and everything green, but they don’t have so much knowledge of wild animals in the forests. Is it like that?*

- You are right. We like staying with temp animals. But the wild animals I fear. So surely, we are not free with. So let them stay in the reserve.

- There is one thing. The total account is misunderstanding, between the people and the national government. Because now, in Taita, 62% of our land is now for animals, wild animals. 62% of Taita land is national park. Now the rest is on private, companies and whatever. So, the people themselves have no land. See now? So there is a breach. So you see, the greater part of national budget or national money comes from the park. So you see now? The greater part of the Taita county is not entitled to have anything. It is not possible to get anything. Our example here, we are trying to make laws, to convince the government, now for Taita to, to be given a percentage of the animals they generate so through this animals and this park. So, but they have been said for a long time, for years and years and they have never been implemented. So there is a conflict. When we come to that one, there is a conflict. And now, they are starting to protect the animals.

*Well, do you have recommendations how to deal with this conflict?*

- Yes, what we should do, there is a county called Turkana, that is where oil has been found. There were two month or three month, when oil has not been flowed to Mombasa. Why? Because the Turkanas said, this should not go on until they are given percentage. 30 % of the amount of oil should be given to the county. So that the people can benefit. The problem in Kenya is that, when the assets are utilized, people of that area, they never get anything. But that is what going on. But I am happy, the parliament is passing those laws, so that we get something. And the Taitas also should get this from the park, for the environment.
Okay, they claim that, when they go to budget, then the Taitas, the money which is given to the county, for development, does even comes from the, the money was earned by the park. But we are the protectors of the animals, we should get a percentage. However small. You know it is a lot of money, it is the one building roads, it is the one doing all that things. But we should also get something, like Turkana got. They have won! They stopped the oil. The Turkana are warriors. Like the Maasai. Look what they did at the Mau-forest. The people in the Mau-forest are not Maasai, they come from other counties. Now, the Maasai say, if the government is not going to remove them, the Maasai themselves are going to remove them. So now, the people are going out of the forest. So, such things should be done, so that we have peace.

- If you want peace, prepare for war. That is, what the British say.

Thank you very!

Interview 3: Kenya Forestry Research Institute (KEFRI), Ngerenyi

To start with, I would like to ask you some general questions:

When you think about Taita Hills Cloud forests, which images come into your mind?

(Spontaneously: Please name both positive and negative aspects.
Positive aspects are that the community is pro conservation, very conscious, passionate and actively participate in conservation. The negative is that we have lost large areas of the forest cover in Taita hills.

How would you describe the current situation of the Taita Hills Cloud forests? (Considering interaction of nature/locals/government)?

About 0.5% of forest cover is lost annually. However, there is still and an opportunity to reconnect the Taita forest fragments using both indigenous and exotic species. The Community Forest Associations are also very weak. KEFRI is currently working to strengthen CFAs around here. The community does not have the Knowledge on how to go about CFA’s and partly it is the government to blame for it because it has not invested enough education to the community here regarding the CFAs. We are also thinking about how to remove the plantations from the forest fragments. Last week we formulated a policy on the strategic management of the Taita hills forests.

Could you please clarify who is responsible for the different forest fragments especially Fururu, Susu and Chawia? (National government, County government or local communities)

There is no community forest management for the officially gazetted forests. Fururu is gazetted National government forest while Chawia is a County Government forest. Before the County government system in Kenya, Chawia forest was a Municipal forest.

[He did not know who is in charge of governing Susu fragment]

Speaking about the interaction of locals with the area of the Taita Hills cloud forests:

What is produced around the Taita Hills Cloud forests? (Please name all the different kind of products that come into your mind, you may name legal and illegal activities):

Majorly it is maize and grevillea, only recently has nature Kenya introduced honey as an alternative source of income.

Is there or has there been a change in the products coming from the forest during the last years? If yes, what are reasons for this shift?

No, it has been year in year out of monocropping that is why there is a severe decrease in soil fertility around the hills

What are the reasons to produce these goods (private use/business/...)?

Mostly it is for subsistence.
To what extent do local people know about the importance of biodiversity, endangered plant and animal species or the services (water, soil, …) that ecosystems provide to them around the area of the Taita Hills Cloud Forests?

No they are not aware of endangered animals in the area. People have a bias towards plants and trees because they get tangible ecosystem benefits from them as opposed to animals. Life is all about surviving and meeting your needs.

There visible incentives for conserving trees than animals. Animals are more often seen as destructive.

What is the extent of awareness among locals and institutions that this area is sensitive and fragile and that its ecosystems can easily be destroyed?

- locals
- institutions

KEFRI promotes high commercial tree species on farm lands through which it aims to indirectly contribute to the conservation of indigenous forest/ endangered tree species in the forest. We identify cleared areas in the forest for reforestation. We have 6 experimental plots in Chawia forest and 9 in Ngangao. We also screening out various indigenous trees to pick out the pioneer species for the forest fragments. However, we only do research.

Local people are not aware about the sensitivity of the biodiversity in this area. However, Nature Kenya is currently taking the lead in educating local people on biodiversity.

I would also like to ask you some questions about the management and protection (current/future) of the Taita Hills Cloud forests:

Which institution or administration is responsible for the management (and protection) of the area? How many people work for it?

Kenya Forest Service (KFS) takes up the research from KEFRI. KEFRI develops policy briefs through it’s research recommendations and passes the drafted policy briefs to KFS for their contribution after which it is taken to Ministry of Environment (County Level), the Minister then tables it to the County Assembly for parliamentary debate and adaptation. The passing of the regulation/law is highly dependant on the good will of the governor because he can influence the MCAs to pass the regulation/law. If the policy is passed, it is taken back to KFS for implementation.

We formulated the County forest management policy for three days back to back together with 6 other stakeholders including KFS, KWS, Nature Kenya, County government, and Wildlife works,

[He explained that the described current draft policy for Taita Hills forests management is still undergoing this process and has not yet been tabled to the county parliament].

Does your institution have any role to play in protecting the Taita Hills Cloud forests? If yes, please list the roles.

We work strictly on trees. We are currently concerned with the conservation of Coffea fadei which is a wild coffee on the UN red list. We are also researching on how cicigamiam, qeinez and Albesia, a nitrogen fixing tree can support the recovery of the degraded areas.

We have tree nurseries here at KEFRI. Farmers have to request for the training. We work together with groups, we identify a good group after they make a request for training at the institute. We then made a request for training funds to the deputy director of KEFRI, and when approved we can train a group.

[***The spellings of the tree species are wrong and need to be confirmed. On further probing, he said that KEFRI has not trained any groups in Taita Hills since it established here in September 2017]

Which of these actions do you consider being successful?
KEFRI only has experimental plots and has sent recommendations to KFS because it is the mandate of KFS to implement but none of our recommendations for Taita hills has been implemented so far.

What should be done in the future?

The clearance of the eucalyptus plantation but there is still a standoff between the local people and the government on the benefit sharing process of the cleared eucalyptus and that stand off seems will take some time so perhaps the eucalyptus will not be cleared anytime soon.

At the very end, I would like you to comment on the following issues

How does the plantation of eucalyptus trees in forest patches affect their habitat quality?
We have not done any local research on how eucalyptus trees affect the habitat quality. We have recommended to KFS to get rid of all eucalyptus plantations in the forest fragments.

Is there an official system of benefit sharing of harvested trees between the government and local people?

No

Are existing (Community Based Organizations (CBOs) active?
The existing CFAs are very weak, not objective and they want to politicize everything. They are not serious. They do not have a management plan and the benefits of cost sharing between the CFAs and government are not clear. The government has not trained the community on how the forest should be co-managed.

From our field work, we have learnt that local people are reluctant to plant indigenous trees, why is it so?
Indigenous trees take a long time to mature and therefore people would rather plant high commercial trees. But we encourage farmers to balance between indigenous and exotic trees. For example, by sparing a piece of land where they can plant indigenous trees for their future generations.

What are the causes of chronic forest fires in some of the fragments?
The fern which is an invasive species is the cause of forest fires here. KEFRI is researching on how to control the fern naturally. Fires spread during land preparations for planting when farmers clear their farms by burning.

Interview 4: Helsinki Research station, Wundanyi.

To start with, I would like to ask you some general questions:

When you think about Taita Hills Cloud forests, which images come into your mind? (Spontaneously: Please name both positive and negative aspects.

The cloud forests are forested areas acting as attraction of rainfalls. It is also having endemic tree species, wildlife, and sources of rivers.

The forest cover has also deteriorated.

How would you describe the current situation of the Taita Hills Cloud forests? (Considering interaction of nature/ locals/ government)?

Forest cover has declined. At the moment people are trying to rehabilitate water catchments, reforestation in areas where trees were. There is a lot of improvement and understanding about conservation by the communities.

Describe the extent to which the situation has changed during the last 20 years?

There has been a lot of forest encroachment due to population growth. The forest boundaries should be well marked to avoid further encroachment.

Could you please clarify who is responsible for the different forest fragments especially Fururu, Susu and Chawia? (National government, County government or local communities)
It is the role of the communities to protect the forests. It is upon the communities to stand firm and refuse exotic trees.

Speaking about the interaction of locals with the area of the Taita Hills cloud forests:

What is produced around the Taita Hills Cloud forests? (Please name all the different kind of products that come into your mind, you may name legal and illegal activities):

- Harvesting fodder for livestock.
- Collection of firewood with or without permission
- Ecotourism
- A lot of research
- Ecosystem services

Is there or has there been a change in the products coming from the forest during the last years? If yes, what are reasons for this shift?

Exotic trees have decreased in the forest fragments but are increasing on farmlands and private forests. The introduction of the power saw has increased deforestation.

What kind of ownership on land exists in this area? How secure is the land?

How do you deal with squatters/illegal settlers occupying the land? What is your opinion on this?

There are people with ownership/title deeds around the forest and they keep pushing the forest boundaries.

We heard that there are environmental laws and rules; that regulate the use of forest resources- like e.g. a ban on tree logging, a ban on charcoal burning and a ban on hunting forest animals.

How are these laws enforced?

The laws are enforced through a government system. Kenya Forest Service (KFS) has the mandate to give permission for harvesting tree resources.

Also through the local administration of chiefs and village elders.

What is the extent of compliance to these laws by the locals?

The senior KFS officials give permits to outsiders to harvest trees. The community gets pissed; they question why they should comply with forest laws while outsiders’ benefit. They therefore harvest trees without the right documentation.

To what extent do these laws have negative impacts on the situation of local people?

There was high corruption among the government officials concerned with forestry in the 1980’s until 1996. They harvested a lot of indigenous trees from the forest and local people were angry because of this.

To what extent do locals know or get information about these laws?

Many people are learned, attend environmental meetings and people have radios and read newspapers. They also inform each other using word of mouth, attend environmental seminars and read the constitution.

To what extent do local people know about the importance of biodiversity, endangered plant and animal species or the services (water, soil, …) that ecosystems provide to them around the area of the Taita Hills Cloud Forests?

What is the extent of awareness among locals and institutions that this area is sensitive and fragile and that its ecosystems can easily be destroyed?

- locals
- institutions

Majority of the people are aware through learning in school and also living with nature. People know a lot has been lost and that there is need to claim it back for example through planting indigenous tree species.

I would also like to ask you some questions about the management and protection (current/future) of the Taita Hills Cloud forests:
Which institution or administration is responsible for the management (and protection) of the area? How many people work for it?

AFERIA project which is implementing the results of CHIESA project by offering information on pest management. Parasitoids are natural enemies of certain pests causing destruction to crops. For example there are small wasps laying eggs on maize that eat caterpillars and we also trap fruit flies by setting traps with female pheromones to attract male fruit flies. We also have demo sites to show people how to do drip irrigation. We train farmers on push and pull method to control armyworms where they plant Napier and desmodium grass along terraces to repel army worms and farmers can harvest the napier and grass to feed livestock.

What are your personal ideas for protecting the valuable areas better, but at the same time remaining or even improving the situation of the local people?

People should know that the forest fragments are a source of many rivers. Especially the people of the lowlands who benefit from these rivers should be involved in the forest fragment conservation.

At the very end, I would like you to comment on the following issues:

How does the plantation of eucalyptus trees in forest patches affect their habitat quality?

Eucalyptus is growing in most areas and it is highly invasive.

Why are the old eucalyptus trees not harvested?

If a tree is on protected forest no one has mandate to harvest. It is government property. When KFS tried to harvest there was an outcry claiming corruption.

Is there an official system of benefit sharing of harvested trees between the government and local people?

No

Are existing (Community Based Organizations (CBOs) active?

Yes

From our field work, we have learnt that local people are reluctant to plant indigenous trees, why is it so?

Because of land scarcity there is not enough land per capita to plant indigenous trees. Also local people fear if they plant indigenous trees they will be welcoming primates and generally indigenous trees take a long time to mature so people want fast maturing trees to sell timber.

What are the causes of chronic forest fires in some of the fragments?

Due to demand for firewood, therefore people burn forests to get permits to collect dead wood. The forest fires are usually around October. Which is a very dry month in the area. So people burn fires as a tradition to call for rain. Also due to strong winds fires may spread from farms to the forest. There is also the notion that forest are harbouring primates and therefore people burn down forests to get rid of their habitats. Local people may also burn grass to get rid of ticks and the fire accidentally spreads. There are also cigarette accidents where a smoker throws a carelessly throws a cigarette away without putting it off. In September/October of 2016/2017, 7 fragments were on fire at the same time and this was linked to beliefs of forest burning.

Do you have any further remarks or questions?

If we have a chance to create awareness around land and title deeds. As it is now, land belongs to the father and the other family members are reluctant to invest in it for long-term conservation like planting indigenous trees and soil conservation.

Interview 5: IRUWA Solar Heater Taita Hills
Um so my questions will last 30 minutes I guess, I don’t know if you have that much time and if I ask one question anyone can contribute, so my first question would be some general questions when you think about Taita Hills forests the fragments that are remaining what images come into your mind, you can say both positive and negative?

What images, okay ee like you can see the fragments and I feel like its somehow, you know it’s like there are sometimes many many of this it was covered by the forest and now only of these small parts are remaining, it’s getting less and less and I think the people really have to protect the area, okay there are some things now going but sometimes I feel like it’s still not on the mind of people they really have to protect the primary forest but still I think it’s nice that you can find still the biodiversity here and those unique things and I think there are some places where already removed completely so I think it’s still good something left you can protect.

And...

To add on that point aa like to be the way it seems when I was young we had a lot of rivers and even the place where we are staying, it was a water catchment area so but with time the climate condition changed completely because in Taita like people here had all their season planting and harvesting in fact they had tough times like for the maize to be dry so there were a lot of rains so I feel like now the way now the environment looks like people are just cutting down the trees. There is a lot of effect you know to the climate conditions.

Okay and of course you have already shown us what you are doing, but could you just in a very simple sentence tell me what you are doing to protect the situation that you have described or to help the situation

Mm yea we are producing solar water heaters to support renewable energies here using solar um heating the water instead of using the timber and firewood people were collecting cut the trees here in the forest by using and having firewood you can see it. Still you can see it like Wesu or something it’s getting less and less every year.

And since that like we went for the research like is it happening really with our project you know so there was the first system that we had installed the clients we had to visit them so being there we met like people everyone was giving a positive answer like there was another one saying like okay we have been using 3 bunch you know firewood but now it has reduced to 1 per week so we saw like okay this is an achievement so it’s working like protecting the forest.

And how do you describe the reception of your products to the people because I have not seen any of your products in the homes we have visited and we have visited like 300 homes around Fururu, Susu and Chawia

Yea it’s still in the beginning it has to first [cross talk] Here in Chawia we have 2, but like it’s a new project it’s a carrier so the first was only about research and now it’s getting more and the first year our project…[Cross talk][phone vibration] systems and now it’s getting more and more we can see it from the numbers we are selling so I think it has potential but of course it needs a lot of effort to really make it the program to make people use solar water heater instead of firewood.

[cross talk]

And might you be working with any governmental institutions like Kenya Forest Service or at the moment you have yet no collaborators

We already tried to connect to some governmental institutions… [phone vibration] or other organizations [Cross talk] and Non Governmental Organizations that will give us some credit
or subsidies but it’s really hard sometimes most people like will say okay we’ll come to you okay like 4 organizations promising even the nearby project they say it’s a good good product so since we are dealing with the farmers let the farmers decide on their own so they working on the money issues like because the economy of Taita most people they are not poor but there are on the average you know so paying like 45 to the most of them sounds to be a larger amount but it’s not a larger amount someone needs to decide you know decide but has to feel the importance of the solar water heater first.

So have you approached any organization Kenya Forest Service?

For this we have been meeting on our marketing events, like NEMA (National Environmental Management Authority) even they have visited our office we’ve visited their office in Mwatate we have been having some of their contacts you know like okay they need to work hand in hand some of … TISTI in Nairobi it’s a organization which deals with the farmers we were to have a meeting last year and said they will come end of Christmas but they didn’t manage but we are hoping for the best, like hoping for the best like we already said people are sometimes not really reliable here so you always say yes yes yes and if until you get to the point you really can’t make the partnership its sometimes difficult. Like but for example, for the biogas project there was we really managed really got manage they got [not clear] mess and they got a lot of subsidies actually the farmers only payed half of the price and the other half was paid by … mess through the government so they really managed to get a good partnership there.

And you are still working on the biogas or you have switched over completely to solar water?

Aa we still do it but usually the trend [not clear7:20-7:22] the biogas plants now so sometimes they do it on their own so sometimes we follow them what work they have done but it’s not like we are not committed on that as we feel like it can work on its own maybe as we just find plans we can come to the office you can just link with the contractors where are you located in Taveta you can just meet one of the contractors there and just go and work so us we don’t play a big we’re just to link that’s all you know.

Okay and because the biogas system has been there for a long time have you done like monitoring and evaluation like could you say how much it has helped the forest or?

Aa for sure there is one of the volunteer who came here Katherine you know, Katherine and visited me I feel like it was more than 70 clients who were having the biogas so when the survey you know she wrote it for her aaa what was is Masters thesis she made research about how good the system plants are working if they are good and its quite new you can have it if you want.

Okay, yea sure...

I think maybe I should ask her first but yea.

Okay... when you go to sell out this solar water equipment do you create awareness around it, do you tell them why you want these I mean for them to adapt this project do you create environmental awareness or?

Like what aa motivation ee yea of course [cross talk] we do it because we are still half of the projects [not clear] general and environmental issues so first you need to make like client aware to the situation he’s living around so once he get it [not clear] solar water heater because most people think it’s a business but to us it’s not business that way have some customers who read have for example like electric heater so they are mostly not really used they don’t need the solar water heater but they still buy the solar water heater even if they have the electric heater.
So can you say that you feel that the awareness of your clients about biodiversity how do you say about their awareness I mean if I have electric heater and still need to buy this your equipment does it mean I am more aware of the environment or?

Umm maybe to answer on that I feel first the client we need to get to know like you are using the solar heater say the benefits of our solar water heater so its upon him now if he feels like okay I feel I need to switch to the solar water heater because like one benefit is like once installed the solar water heater is once you pay there is no monthly bills so you shall be using warm water provided there’s sun so someone says okay someone could just pay the bills of the electric and you know like the way they work the electric heater boiling the water it raises a big bill you know so it’s easy for someone to buy to pay like problems so when he thinks of this we feel like okay I will just give just give me time I will come to you they say like it’s a good way so mostly electric those I feel like ee most people know about ecological problems here and that the climate is changing, there are many people say the climate is changing here so it’s really concerning us and they know about ecological problems but I think they don’t have much knowledge about what is going on here exactly. For example the biodiversity trees and plants came here and now they are spreading and that there are some that are indigenous trees decreasing of it I think they are aware but they don’t really think about what is influencing that is our farming and that is doing this is it really important for biodiversity I think people don’t know that much about it.

And what are your personal ideas about protecting the Taita forests but at the same time improving the situation of the local people, and I think that’s what you are doing?

Yea that’s what we are doing like trying to avoid the people to cutting down the trees and make the solar water heater to provide alternative.

Okay, from our research, we have seen that religion especially Christianity plays a very huge role around Taita that pastors are very influential does your organization integrate religion in its conservation and marketing campaigns?

Mmmmmh like religion its part of our marketing or

No no that the religion has so much influence on people we are thinking when we ask this question we are thinking about whether we should actually educate pastors on ecological knowledge so that they can tell their followers because their followers almost agree on everything that the pastors say so is it something you’ve thought about or not?

Mm we thought about for example It has been working It’s on systems and the churches [not very clear] also like we had some of the volunteers like Theresa they have been managing to some the churches like gospel like in Werugha there was a time like 2017 there was a big demo in the big church there and after people congregation they could just put the system we asked the pastors if they had any questions then we just gave some papers for those who were interested of anything if they wanted to get to know another pastor there and managed to give mwalimu systems for the 6 weeks so his followers they could just come and see and when I went like 2 times a few times there I had a positive answers but people were saying like okay the economy, money [not very clear] we are working on that issue now.

Okay, I will not ask more about... because I think it’s what Slas is doing do you have any further remarks or questions, I mean the interview is over

Okay ummm

Maybe something important that you think about in terms of what you are doing and conservation of Taita cloud forests that I have not asked?
Eee maybe general aah you have visited our workshop and you have been just going around like you met like 300 people and we are having a challenge once you get the people [not very clear] but days go without getting any feedback.

Interview 6: Ministry of Environment, County Government of Taita-Taveta.

[This interview was interrupted by many phone calls by the environmental officer. He was in a hurry to leave and evaded many of the questions. He copied several written documents and magazines into my drive to read and find the answers of what I wanted I know]

To start with, I would like to ask you some general questions:

How would you describe the current situation of the Taita Hills Cloud forests? (Consdering interaction of nature/ locals/ government)?

The remaining forest cover is around 5% including woodlots and agroforestry for both indigenous and exotic trees. Exotic trees interfere with the local ecosystem.

Describe the extent to which the situation has changed during the last 20 years?

We have had challenges with deforestation, encroachment, uncontrolled charcoal burning and forest fires.

Community is doing bad things by logging.

Speaking about the interaction of locals with the area of the Taita Hills cloud forests:

What is produced around the Taita Hills Cloud forests? (Please name all the different kind of products that come into your mind, you may name legal and illegal activities):

Timber, firewood, charcoal, beekeeping, butterfly farming, birds.

Is there or has there been a change in the products coming from the forest during the last years? If yes, what are reasons for this shift?

Alternative livelihoods e.g. Butterfly farming and climate change.

I would also like to ask you some questions about the management and protection (current/future) of the Taita Hills Cloud forests:

Does your institution have any role to play in protecting the Taita Hills Cloud forests? If yes, please list the roles.

Last week we finished the draft of the forest policy where we involved the national government through KFS and public participation.

We also hold awareness creation meetings monthly but at the moment we have funding issues so we are not organising the meetings.

The county government achievements between 2015-2017 are;

- Green energy projects (Biogas)
- Recycling plastic bottles
- Environmental impact assessment
I would like to ask some questions related to religion and indigenous knowledge:

To what extent does your organisation integrate religion in its conservation campaigns?

We invite religious groups to awareness creation and tree planting campaigns.

To what extent and in which way can religion work hand in hand with policy and science in nature conservation?

The climate change adaptation for Taita-Taveta was done by a religious group.

At the very end, I would like you to comment on the following issues:

How does the plantation of eucalyptus trees in forest patches affect their habitat quality?

Eucalyptus trees release a lot of water into the atmosphere. They are the best for conservation and rehabilitation. They are also good for drying up wet areas. Indigenous trees take long to grow.

Is there an official system of benefit sharing of harvested trees between the government and local people?

No.

What are the causes of chronic forest fires in some of the fragments?

Traditions, in dry season people burn the forest is they want rain.

Interview 7: Chawia Community Forest Association

When was the group founded?

The group was founded in 2004, but officially registered in February 2015. We were 18 founding members.

How many members are in the group?

???

How did the group come together?

We were 5 small user-groups, now there are twelve. All user groups are members of the Chawia Community Forest Association.

Please describe the structure of the group

We have an executive committee of (6) members:

Chairperson
Asst. chairperson
Secretary
Asst. secretary
Treasurer
Asst. treasurer

We have a Conflict Resolution Committee (6 members), an evaluation and Monitoring Committee (3 members) and a Procurement Committee (3 members)
We often meet once per month. Registration fee is 50Ksh and there is a monthly contribution of 20Ksh per month.

The respondent pointed to a document titled: Constitution and rules for the Chawia Community Forest association (2015)

[He explained that the constitution was formulated on the basis of: Specimen Constitution for a Society. Constitution and Rules, Provided by the Registrar of Societies, Nairobi, Kenya]

What is the role of the Chawia CFA in managing the resources of the forests?

The CFA scouts monitor the activities in the forests, voluntarily, they are not paid. They make sure that the people who gather firewood only take the dry ones. They are on duty thrice per week: Wednesday, Saturday and Sunday. On these day they make rounds in the mornings, afternoons and in the evenings. They are required to record any observed destruction of the forests. Also any encroachment, that means people farming in the forests. In case of violations they report this to the Conflict Resolution Committee and the assistant chief. They are responsible for stopping the encroachment.

Which forests are managed by the Chawia Community Forest Association or are there only Mitengos

The Chawia Forest is under the county government. Mitengos are only for the community and managed under the Chawia CFA. Right now there are (4) in total. Right now, we are in the process of making an agreement on how to manage these forests. The stakeholders involved are: Nature Kenya, CFA, the county government and KFS. Several meetings have already been held since 2014. In 2014 the county government was not involved. At that time there were no regulations to involve the county government. As of 2015 the regulation changed and they became involved. This was initiated by KFS and Nature Kenya. They contacted the chairperson of the Chawia CFA. The last meeting was held in July 2018. They promised that by September 2018 the draft of the management agreement: (Draft - Participatory Forest Management Plan for Chawia Forest 2018-2022) will be ready. The idea is to meet again after that date to discuss the draft and make any necessary changes needed.

Are there any partnerships?

Yes, for example Nature Kenya and KFS. They provide trainings on alternative livelihoods and forest management. Trainings are free of cost.

Sometimes we ask them to train us on some particular issues. They also initiate some trainings as well. Mostly the trainings are held in Wundanyi or Arabuko Sokoke in Kilifi. They take care of all the expenses.

[The respondent shows me two certificates of courses he has attended: Advocacy, Resource Mobilization and Opportunity for Local Engagement with the Government (County and National) Provided by: Nature Kenya. Held in Wundanyi September 2016] and [Leadership, Institutional Management and Governance. Provided by: Nature Kenya Held in Kilifi County January 2018]

How many people are trained per training session?

About 6-8 people, for example I go to Wundanyi for training. When I come back I call the executive committees of the user groups. Then they are trained. After training them they train their members.

How is the quality of the training for the other members guaranteed?
Those that undergo training are provided with the handouts of the training sessions.

What are the benefits of the CFA to the community?

The local community harvest grass from the forests. Some gather firewood. Sometimes if someone wants to build they get permission to collect lumber from the forests. Our main water springs come from the forests. Resources for basket weaving is taken from the forests, as well as medicinal herbs. The CFA protects the forests from destruction, educate the people about the forests.

Please describe the former status of the forests

In olden times the forests were well preserved by the old men. Then came a time when younger people started cutting the trees for sale. Between the 60s and the 70s people started harvesting timber for sale. Then the forests became very degraded.

A few of us realised, that it was important to stop these people from cutting the trees down. Then we started planting. In the late 1990s the community started replanting trees.

In your opinion, why are the people more interested in the protection of the plants and trees than in the protection of the animals?

No, we protect the animals very much. We have these birds, endemic birds. These days we don’t hunt in the forests.

Maybe, because they used to eat them (the animals). Some years passed they used to eat the animals, but these days that is not allowed.

The CFA and KFS has put a ban on this to preserve the biodiversity of the forests.

Which values regarding the protection of the environment are transmitted to the people of the Taita Hills Cloud Forests and how are these transmitted?

When the forest was very healthy the water springs were very many. After destroying the forests some springs dried up, therefore some of us started educating the people about the importance of the forests and securing the water supply through public Barazas. When they understood that they wanted to rehabilitate the forests and started planting indigenous trees in the forests. Nowadays, some people are even planting indigenous trees in their own gardens.

At the end I would like to hear your opinion on the following statement, as said in a previous interview, “The CFAs here are weak.”

Respondent laughs and says, “It is those, who do not attend meetings!”

[Then he asks who said that. I apologised and told him I was not able to disclose the source of that statement, because the interviews are anonymous. He smiled].

Interview 8: Furaha Women’s Group

When was this group founded?

The group was founded on July 27, 2018

We were three founding members, but at present we are 18 members, (4) male and (14) female. At the time we started we were only women. Now we need to change the name from Women’s group to include the men.
Before we never informed anyone about the replanting. In 2016 we first started replanting. As of May 2018 we started keeping records of what we are doing. We located a forest patch, where it is vacant then we took pictures and texted KFS in Mwatate. They told us we should expand. They brought us a Nursery Extension Form, so that we can be recognised. Now it is known that there is a group in Chawia Forest that is involved in tree nurseries. So, anytime a stakeholder needs indigenous trees for replanting, priority will be given to us.

What was the registration process like?

For the registration we needed to have a constitution. We met as a group. We told them the whole group must be involved. Everyone gave their views. The views were noted down. Afterwards we chose (5) people to draft the constitution using the views of all of the members. They returned the draft to the members after (5) work days. They read it to the members to compare if the draft is the same as the views aired by the members. They read it and it was reviewed to see if they added their own views or if they remained with the ideas of the group. All members decided there is no need to revise it.

So, with that constitution we registered the group with the Social Services in Mwatate for recognition purposes. The registration cost 1000Ksh. The certificate was delivered instantly. The certificate was paid through the membership fees.

Where are you located?

We meet once per week in the forest. On Wednesday from 10:30AM - 11:30 AM Discuss the previous minutes and any other business. 12:00 - 5:00PM we work in the nursery. The forest is zoned for different alternative livelihoods.

How did the group come together?

The founders called a ´Baraza´. They wanted to form this women’s group. So, they mobilised women to form a group. We saw that it was important for us as women to start a group for tree nursery; without being driven by anyone. Out of the need for conservation, rehabilitation and reforestation. Those are the main objectives of the group. Even on our own farms we have to plant trees.

What is the goal of the group?

The rehabilitation of the forest to its original state.

We have planted 14,000 seedlings in the forest already. The goal is to return the forest to its original state, by planting indigenous trees. Not only in Chawia forests, but in the Chawia ward, to reforest all the forests.

The respondent explains, that a ´ward ´is headed by a ward administrator.

How is the group structured?

The group has an executive committee, which consists of: Chairperson, Asst. chairperson, Secretary, Vice Secretary, Treasurer and two other members of the group.

Are there any partnerships?
We have no financial support. It is through our own efforts. The members contribute 100 'bob' every month. The collections are used to finance our activities.

What is the current situation of the group?

Currently, we lack the materials we need to do the work, for example watering cans, sieves, rain coats, rubber boots, hoes, machetes and the lack of a shed to protect us from the rain or when it is sunny.

The ban on plastic impedes our work so, we are now on a forced leave.

What are the benefits of the Furaha Women’s Group?

We also have cultural reasons to protect to protect the forests. There are some trees e.g. 'Maghombo', culturally they are significant to attract evil spirits.

The large trees, e.g. 'Musu', 'Muumu', 'Muumu', 'Mkuyu', 'Ndundu' and 'Mserewache' are responsible for housing the spirits that are responsible for protecting the forests from being destructed.

There are some trees indigenous trees that are necessary for attracting the endemic animals. For example, the Taita White Eye bird (Ndido, Mwora, Mdawa).

Others are important for medicinal purposes (Mngima, Mdawa, Mgumo).

There are some that are used for medicinal purposes (Msawa, Kizunumoto, Msangama)

The respondent points to a bush:

This is Msumwi, which is used to treat coughs.

There are certain parts of the forests that are forbidden to trespassers. Only the rainmakers, Wagnosi wa kifumbu (does the spiritual cleansing), and the medicine men.

When we destruct those spirits we destruct the forest.

We protect the forest, because it is important for fresh air, rain, firewood, medicinal herbs.

The respondent laughs and says:

Also the group is important, because we learn about the forests, we cook together, eat and have conversations.

Please describe the former status of the forest?

In the older days, the forests were very thick, about 20-30 years ago. We had a lot of huge trees.

Are there any future plans for the group?

If we get any sponsors, we are planning to have cottages for eco-tourism. we are planning to fence the forest to separate the forest from the farmlands.

Interview 9: Ecotourism Kidaya, Ngerenyi

When was the group founded?

The group was founded way back 1998.

How many members does the group have?
Initially, we are 5 but now it was gone around 17.

Where is the group located?

Just within this place [the person is pointing on the ground] – Taita Taveta.

How did this group originally come together?

[The person has a confused face, I skip this question]

What is the reason/cause the group has come together?

Trying to organize the heritage value of the county and to bring all the value of Taita in layout strategy.

The goal of the group is to cherish the values of Taita and heritage to empower the locals economically.

In which fields of action is the group active?

It’s active in protecting the forest, animals, the environment and the wildlife, it’s the flora oh the place.

Structure of the group?

How is the group structured? E.g. Chairman, vice chairman etc.

Yes, there is a chairman, vice-chairman, and secretary-treasurer.

Does the group work together with collaborators, stakeholders or any other organization?

If yes, to which extent?

It works together with varies groups and varies stakeholders e.g. religious leader, politicians, educationists, the old viceman, elders of the village, youth and the locals in general within the environment and international organization, NGO (Nongovernmental organization), national government, Wildlife services, Ministry of forest in Taita national and county.

If you want to come to a ceremony, there is a fee for the locals and foreigners. The tour guide expenses and then there are the education expenses.

Are there any benefits/profits coming along with the activities/work of the group?

Yes, it depends how often tourists actually come.

If yes, please classify them into 3 different orders:

a) Economic benefits

What we receive from the tourism and we give service. For example, we can come up with toilets like universities, school. We come back in the water, to improve our water supplement.

b) Social benefits

We share a lot in terms of for example: let us remove all the dirt or maybe planting trees. We meet and share, and we see the strengths. They protect soil erosion, timber too exotic: forest air, water availability, timber, selling charcoal, we also get local herb.

c) Environmental benefits

One of them is actually making the place for the people to stay. We look after the rivers, air pollution and how they expose [...] providing food for the people, fresh air, good environment ceremony for example.

How do the group activities/work benefit the livelihoods of the local people around your village?

[The question is answered in question 3]

Status quo and future

Which challenges are the group facing at the moment?

The meetings are occasionally on just like tourists.

What are the future plans of the group?

To empower people to come up with a very big center with an education to recruit youth. To open a hotel where we have the tourists come to let them know about the wildlife. A star hotel to receive the tourists.
Appendix 2. Participants responses.

*Please click here to download file 'appendix2.xlsx'.*