

Community Benefit Audit: Uzungwa Scarp Nature Forest Reserve**Biological Significance of Uzungwa Scarp**

The forest known as Uzungwa Scarp is a Key Biodiversity Area and a vital conservation landscape within the globally-important Udzungwa Mountains, one of the ranges contained within the wider Eastern Arc Mountains. Globally unique for its biodiversity, the Eastern Arc is a tentative UNESCO World Heritage Site. Covering an area of 32,763.2 hectares Uzungwa Scarp provides habitat for a staggering number of endemic and globally threatened vertebrates including the Udzungwa red colobus, the Sanje mangabey, the Udzungwa forest-partridge, the Spiny-flanked chameleon and Wendy's forest toad (Menegon and Salvido, 2005). It is also home to the recently-described grey-faced sengi and the endangered Abbot's duiker. The Eastern Arc biome is one of the richest in the world with the highest rates of endemism per unit area, especially among vertebrates and plant species (Myers et al., 2000). A combination of both the survival of ancient lineages as well as the more recent radiation of countless endemic species has led to staggering plant biodiversity. Uzungwa Scarp is a vitally important water catchment area that feeds the critically important Kilombero Valley as well as the Kihansi Hydropower Project, generating between 15-20% of Tanzania's hydroelectricity.

History of the Protected Area and STEP's Engagement

Originally gazetted as a Forest Reserve in 1929, Uzungwa Scarp was upgraded to a Nature Reserve in 2016. Owned by the Central Government under the Tanzania Forest Services Agency (TFS), the Reserve is managed by its Conservator, together with local government authorities and with the input of adjacent communities. Nature Forest Reserves have the highest level of protection among forests in Tanzania, as outlined by the Forest Act of 2002: no extraction of timber or animals is permitted and human activities are generally restricted to research, education, and nature-based tourism. However, to ensure that local communities could maintain limited access rights to the forest, TFS initiated a consultation process with the village assemblies in the 19 villages adjacent to the Nature Reserve to develop individual Joint Forest Management Plans (JFMs) in 2017. JFMs intend to provide guidelines and regulations for access to the Nature Reserve and the use of forest resources for communities. JFMs provide a framework to ensure that the use of natural resources is managed jointly, equitably, and by the use of ecological principles, ensuring that appropriate measures are taken to avoid negative impacts while also providing benefits.

JFMs were finalized in November 2017 and signed at the village and Uzungwa Scarp Nature Forest Reserve (USNFR) Office level in May 2018. They are still awaiting sign-off at the national level. In the meantime, TFS and local communities have initially jointly implemented several aspects of the JFMs: communities adjacent to the reserve take part in monthly patrols and have limited access to some forest resources. Oversight of these activities is undertaken by the USNFR Conservator and supervised by the Natural Resource Committee of each village. If the USNFR Conservator, Village Leaders, or members of the Village Natural Resource Committee think that members of the community are abusing these rights of access, they can be temporarily suspended. The yet-to-be-formalized nature of the JFMs has led to some recent miscommunications in this regard, as was observed during the Community Benefit Assessment.

Engaging the Uzungwa Scarp Communities

Southern Tanzania Elephant (STEP) began supporting the protection of USNFR in 2017 through the Uzungwa Scarp Protection Project (USPP) under an MOU with TFS. USPP has supported monthly foot patrols in the Nature Reserve, provided training to patrol teams (including Village Game Scouts, TFS staff, and Anti-Poaching [KDU] Rangers under the Tanzania Wildlife Management Authority) on patrol conduct, equipped rangers with critical gear, and created modalities for integrating patrol plans with both past patrols and ecological monitoring results. Beyond collaborating on monthly patrols, however, engagement with the communities adjacent to USNFR has been fairly limited.

Research shows that the perception of benefits from community areas is a key motivator for community participation in protection (Andrade and Rhodes, 2012). To better understand the attitudes of communities towards Uzungwa Scarp, we developed the idea of a 'benefit audit' to evaluate 1) how effectively the JFM plans are enabling access for communities and 2) whether the benefits provided by the JFM are indeed *perceived* as benefits by the community and 3) to what extent there may be other benefits felt by the communities that are not currently part of the JFM but could potentially improve perceptions of the protected area. Each village has a distinct JFM but they broadly outline access to the same resources:

- Firewood
- Mushroom collection
- Traditional herb collection (used primarily for medicinal purposes)
- Worshipping Sites
- *A note that several villages also reference trail access referring to pathways through the forest that connects Iringa Region to Morogoro Region. This is not relevant to all areas but is included in most JFMs.*

Assessment Methodology

We modified the IUCN Protected Areas Benefits Assessment Tool + (PA-BAT+), initially intended to assess stakeholder perceptions of the flow of benefits from protected areas, to focus on assessing *existing* aspects of JFMs, hence the use of the term ‘benefit audit.’ We asked questions about each of the resources outlined in the JFMs, using the PA-BAT+ framework, as well as a selection of other relevant benefits suggested within the PA-BAT+ assessment questions.

Study Site and Study Sample Selection

Uzungwa Scarp is bordered by 19 villages within three districts. The districts are ecologically distinct, making them useful zones for sampling. We used a modified stratified random sampling approach for village selection, identifying villages that had similar demographics and then selecting from within those for our sample. We generally categorized villages by poverty levels, population size (small, medium, or large), the duration of the establishment of the village, and whether there was any predominant employment source (timber plantation or sugar plantation) nearby. We also worked with our partners, TFS, to identify the main illegal activity in each village; whether illegal timber cutting, bushmeat poaching, or other illegal resource use. We aimed for a sample that represented as many aspects of the adjacent villages as possible. Two villages from each district were selected (see Table 1).

Table 1. Audit Sample

District	Villages
Mlimba	Lufulu Ikule
Mufindi	Uhafiwa Kipanga
Kilolo	Idegenda Mbawi

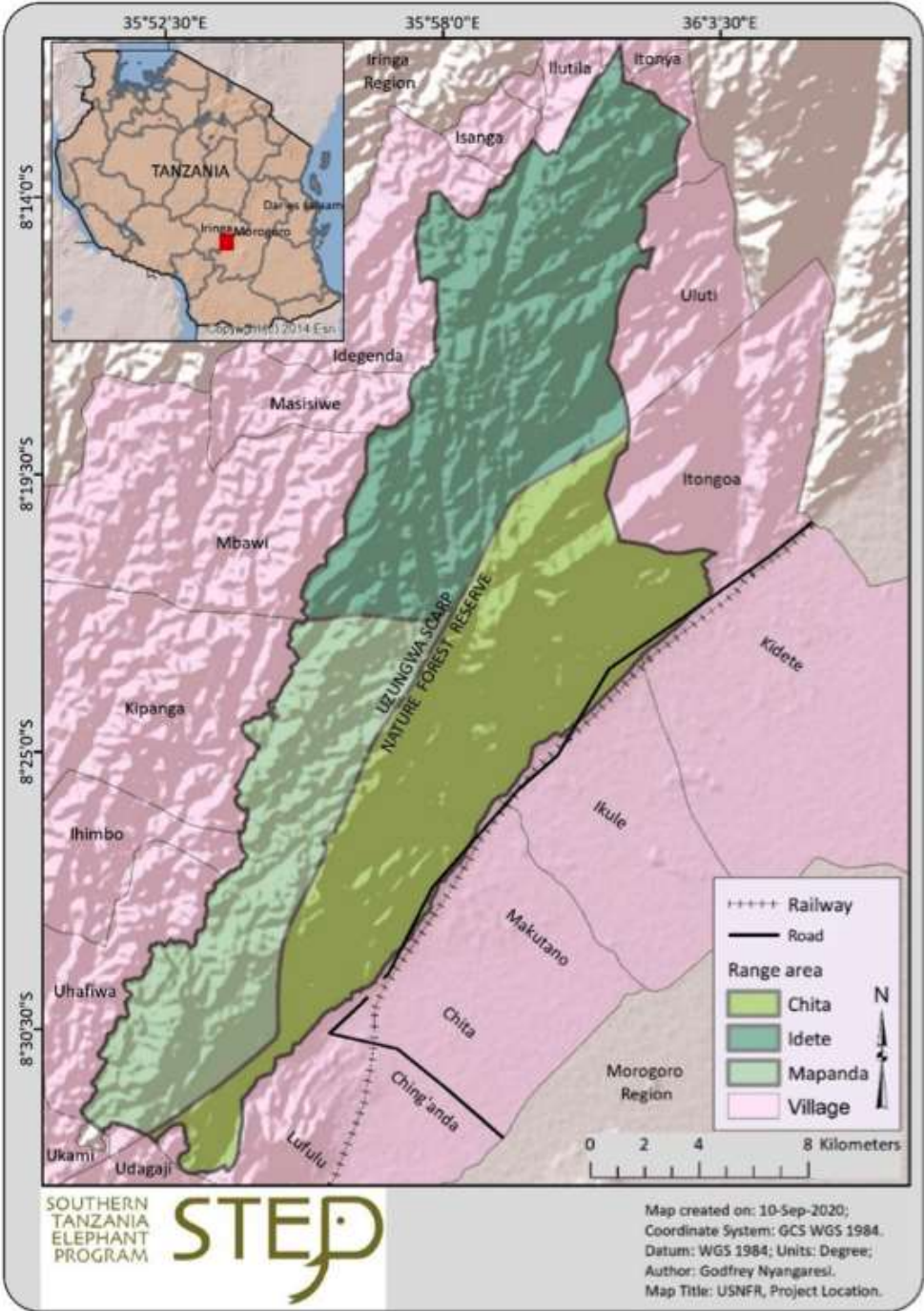


Figure 1: Location of USNFR with its adjacent villages

Interviews were conducted by STEP’s Forest Protection Coordinator. Surveys were anonymous to encourage open communication about potentially negative perceptions of the protected area and potential insight into illegal activities.

A key contextual note: *In October 2021, two villages in Mlimba District, Ikule and Kidete, had their access to firewood temporarily suspended due to suspected overuse and commercial activity in violation of both the Forest Act No. 14 of 2002, Article 26 a-s and the existing JFM agreements. The suspension has been lifted as of March 2022.*

Results and Discussion

Thirty-six participants were interviewed through the Community Benefit Audit Process; 19 men and 17 women. Across the entire sample and within districts, we had a fairly even spread of respondents who classified themselves as living ‘close to the forest’, ‘a medium distance from the forest’, and ‘far from the forest.’ Sixty-seven percent of respondents were born in the village they reside in currently. Only 8.3% had lived in the village in which they currently reside for less than five years.

Across the entire sample, 64% of respondents agreed with the statement: I use the Forest Reserve and it brings me benefit. 5.6% of respondents (n=2) agreed with the statement: I use the Forest Reserve but do not feel a benefit. About 16.7% of respondents said they were restricted from using the Forest Reserve, and 13.9% of respondents (n=5) said they had never been to the Reserve: four saw that it had benefits, and one said it did not.

Table 2 summarises the overall attitudes towards the benefits outlined in the JFMs. Table 3 summarises the current access status of benefits for each of the communities interviewed. Despite the access restrictions on Ikule (and we think a proximity-based fear from Lufulu), it does not seem to have affected perceptions of firewood benefit.

Table 2. Summary of Attitudes Toward JFM Benefits

	Lufulu	Ikule	Uhafiwa	Kipanga	Idegenda	Mbawi
Firewood	Positive	Positive	Less Positive	Less Positive	No Benefit	Less Positive
Mushrooms	Less Positive	Less Positive	No Benefit	No Benefit	No Benefit	No Benefit
Traditional Herbs	Positive	Less Positive	Less Positive	Positive	Less Positive	Less Positive
Worshipping Sites	No Benefit	Less Positive	No Benefit	No Benefit	No Benefit	No Benefit

Table 3. Status of Access Rights per Sampled Village as of November 2021

	Lufulu	Ikule	Uhafiwa	Kipanga	Idegenda	Mbawi
Firewood	Communities viewed the temporary suspension of Ikule and Kidete villages as also applying to them and cited fear of arrest.	Officially temporarily suspended*	Allowed to access	Allowed to access	Allowed to access	Allowed to access
Mushrooms	Communities viewed the temporary suspension of Ikule and Kidete villages as also applying to them and cited fear of arrest.	Officially temporarily suspended* <i>Note: In fact, communities were not restricted but communication from TFS was</i>	Allowed to access	Allowed to access	Allowed to access	Allowed to access

		<i>unclear, leading to the perception that restriction was access to all resources</i>				
Traditional Herbs	Communities viewed the temporary suspension of Ikule and Kidete villages as also applying to them and cited fear of arrest.	Officially temporarily suspended* <i>Note: In fact, communities were not restricted but communication from TFS was unclear, leading to the perception that restriction was access to all resources</i>	Allowed to access	Allowed to access	Allowed to access	Allowed to access
Worshipping Sites	Communities viewed the temporary suspension of Ikule and Kidete villages as also applying to them and cited fear of arrest.	Officially temporarily suspended* <i>Note: In fact, communities were not restricted but communication from TFS was unclear, leading to the perception that restriction was access to all resources</i>	Allowed to access	Allowed to access	Allowed to access	Allowed to access

*Re-opened as of March 2022.

When respondents were asked more about their perceptions of these benefits, some interesting findings emerged.

Firewood: Availability of firewood on village land (i.e. land outside of the Nature Forest Reserve) significantly affects reliance on the protected forest. In Mufindi and Kilolo Districts (Uhafikwa, Kipanga, Idegenda, and Mbawi villages), fuelwood from *Pinus patula* and *Eucalyptus* is widely available, therefore reliance on the protected forest is low. However, in Mlimba, communities rely primarily on the forest for fuelwood. JFMs allow for collection to be determined at the village level: villages decide on the number of days collection is permitted and what tools may be used for collection. Respondents from all selected communities said that axes, bush knives, or chainsaws were not permitted for firewood collection. As addressed previously, incursion from commercial actors in two villages led to overexploitation of firewood collection in Ikule and Kidete villages in 2021. This overuse led USNFR and Village Leaders to temporarily halt access to firewood in October 2021 for all community members. While the access restrictions only applied to two villages in Mlimba and only to firewood collection in those villages, there was considerable confusion among respondents about to what extent it applied more broadly. Respondents were afraid of repercussions

if they were caught accessing resources illegally and therefore took an overly cautious approach to resource access. Permission to collect firewood was restored in March 2022, after this audit was conducted.

Mushrooms: Very few respondents knew where, when, or how to collect mushrooms from USNFR. They said this information was “knowledge from elders” that has not been well passed down, hence access is limited. Other respondents said mushrooms were available in other areas within village land, minimizing the importance of the Nature Reserve as a collection site.

Traditional Herbs: Most respondents said they did not use herbs for medicinal purposes, relying instead on pharmacies and health centers which are now present in all communities.

Worshipping Sites: Only respondents from Ikule village had slightly positive perceptions of the provision of worshipping sites via the JFM. The majority of respondents said these traditional beliefs are no longer relevant as residents shift towards Christianity and Islam. [Anecdotally the area is used for burials, not technically a provision of the JFM].

When asked what are the opportunities to improve existing benefits, respondents had several thoughts:

- Initiate forest conservation awareness campaigns in adjacent villages.
- Clear communication on the allowable JFM benefits and their access.
- More active monitoring of firewood collection so that it can be sustainably managed. Notably, communities wanted more oversight, not less, to ensure that firewood collection was sustainable.
- Better demarcation and management of trails that are used by communities to shortcut between Iringa and Morogoro.

When asked more generally about the benefits provided by Uzungwa Scarp, respondents listed many, a significant number of which are not included in the JFMs:

Table 4. Summary of overall Benefits and key challenges

Village	Overall Benefits	Key Challenges Accessing Benefits
Lufulu	Water Firewood collection* Traditional herbs* Mushrooms for food* Climatic regulation Soil erosion prevention Local tourism Beekeeping/Honey Increase national income Bushmeat	<ul style="list-style-type: none"> ● Fear of being arrested ● Lack of information about the permission to enter the forest ● Temporary restriction from the authority to collect firewood ● Unfamiliar with areas where mushrooms are available ● Difficulty in accessing water for domestic use during the dry season

Ikule	<p>Water (for domestic use) Firewood collection* Traditional herbs* Mushrooms for food* Climatic regulation Temporary jobs that raise income Beautiful environment Forest has both present and future benefits Learning opportunities for students</p>	<ul style="list-style-type: none"> • Firewood collection temporarily banned • Lack of information about permission to enter the forest • Difficulty in accessing water for domestic use during the dry season
Uhafiwa	<p>Firewood collection* Traditional herbs* Climatic regulation Local tourism Increase national income Beekeeping/Honey Temporary jobs that raise income (Opportunity to be a local guide) Learning opportunities for students Shortcut way (Iringa to Morogoro) Traditional vegetables</p>	<ul style="list-style-type: none"> • Low wages • Poor infrastructure
Kipanga	<p>Firewood collection* Traditional herbs* Climatic regulation Local tourism Temporary jobs that raise income Beekeeping/Honey Shortcut way (Iringa to Morogoro) Traditional vegetables and barks from tree</p>	<ul style="list-style-type: none"> • Restriction of entering the forest with sharp tools • Lack of knowledge about traditional herbs • Only a few people are allowed to enter the forest at the same time
Idegenda	<p>Traditional herbs* Climatic regulation Soil erosion prevention Shortcut way (Iringa to Morogoro) Temporary jobs that raise income Tradition vegetable Food</p>	
Mbawi	<p>Firewood collection* Traditional herbs* Climatic regulation Local tourism Temporary jobs that raise income Tree bark</p>	<ul style="list-style-type: none"> • Only a few people are involved in forest income generation activities including patrols and assisting researchers

Respondents expanded on several commonly-articulated benefits:

- **Water:** Respondents recognized that the forest is vital for domestic and agricultural water access.
- **Climatic Regulation:** Respondents recognized that the forest contributes to climate regulation throughout the year, offering watershed protection, preventing soil erosion, and mitigating climate change.

- *Shortcut Way (Iringa to Morogoro)*: Three forest trails connect Iringa and Morogoro regions, providing expedited movement.
- *Local Tourism*: Cited as a way to promote tolerance between people as they learn from and better understand each others' cultures
- *Beekeeping/Honey*: Respondents identified the forest as an area conducive to beekeeping, a source of environmentally-sustainable income generation.
- *Temporary Jobs*: Respondents especially noted employment opportunities for youth from participating in joint protection patrols, assisting researchers, and clearing and maintaining nature trails, campsites, and boundaries.
- *Learning Opportunities*: Respondents especially noted this benefit for children, saying they can learn by doing and experimenting with ideas, helping to increase forest conservation awareness.
- *Traditional Vegetables*: Access to wild vegetable resources can contribute to the conservation of forest resources.

Key Recommendations

From the initial analysis, the following recommendations for TFS and the Village Governments of the communities adjacent to USNFR have emerged:

- **Provide more clear communication about how and why decisions, especially restrictions are made.** Almost every respondent had questions about access guidelines and restrictions. As noted, most respondents in Ikule were aware of (and angered by) unsustainable levels of offtake from the forest but lacked the resources and agency to take action against larger commercial actors.
 - A clear step forward is to sign off on the Joint Forest Management Plans at the national level so that they can be officially launched and communicated.
- **Expand educational outreach.** Many respondents had experienced some environmental education and reflected on it positively. While less than 10% of the sample had been residents for less than five years, this still represents an opportunity for further education on best practices for forest management for newer, more recent arrivals.
- **Formalize the provision of water as an ecosystem service provided (and monitored) by TFS, and provide more access infrastructure.** Almost 100% of respondents identified water as one of the primary benefits of USNFR. TFS could fairly easily increase water access infrastructure (water access points in each village, each school, health centers, etc) in an attractive way that directly connects the provision of water with the preservation and sustainable use of USNFR.
- **Start beekeeping activities as income-generating activities that align with conservation priorities, and allow beekeeping in designated areas within the Nature Forest Reserve:** Community members were aware of the revenue potential of beekeeping, and many recognized forests as high potential areas.
- **Trial Clean Burning Stoves or Gas Stoves to reduce dependence on firewood:** Until households can reduce their reliance on wood collected from forests, complications around overuse and access will continue. While the factors influencing the adoption and uptake of clean cookstoves or gas stoves are complex and multifaceted, initial research should be undertaken and barriers identified.

- **Plant more village forests that serve as effective buffer zones:** Many respondents noted that the existence of a village forest significantly decreased the reliance on the protected forest for firewood collection. If community needs can be modeled, woodlots made up of quick-growing species can be mixed with slower-growing indigenous species to create a functioning forest ecosystem that enables sustainable offtake.

Next Steps

- We will continue to analyze the results of the benefit audit to prepare an in-depth, detailed overview for sharing and discussion with TFS, village leaders, and other key stakeholders in the Uzungwa Scarp Protection Project. We hope these results will catalyse a new chapter of engagement with USNFR, one focused on enhancing the relationship communities have with the protected area and developing a more holistic approach to protection, one that is based on the value proposition of the forest.
- We hope to develop a strategic plan for community engagement and outreach which will expand conservation education efforts in the communities around USNFR. We hope this strategic plan can be used to access funding opportunities for sustainable income-generating enterprises that can be implemented together with educational outreach to improve the value proposition of the forest.

Works Referenced

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