

Conservation, Restoration and Cultivation of threatened medicinal plants in Kalinzu Central Forest

Reserve, Uganda.

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Project Updates – April 2025



Prepared by; Benard Tumwekwatse (Team leader)

1.0 Introduction

This report highlights the progress so far made about the implementation of the proposed project. It briefly describes the methods used in executing the planned activities, a forest-based survey and community engagement findings, implemented project activities, and the on-going and expected upcoming activities.

2.0 Implemented project activities

2.1 Forest-based surveys of the current status, distribution and abundance of the target medicinal tree species (16th January – March 2025)

As the first proposed activity, the project commenced with a forest survey to assess the current status, distribution, and abundance of *Prunus africana, Xanthoxylum gilleti, Warburgia ugandensis,* and *Citropsis articulata* in Kalinzu Central Forest Reserve (KCFR).

2.1.1 Reconnaissance survey

Prior to conducting a main survey, the project team carried out a reconnaissance in some parts of the forest in order to establish the existing general forest types and other relevant ecological characteristics.



Figure 1: The project team conducting a reconnaissance survey in some parts of KCFR. (Photo Credit: Benard Tumwekwatse)

2.1.2 Sampling and establishment of survey plots.

The forest was stratified into forest edge (0-50 meters into the forest from the forest edge), interior open forest (>50 meters into the forest from the forest edge) and interior closed forest. From each stratum, random plots were established along existing forest research transects and in areas where they were non-existent, fresh transects were established and used for the survey. So far, a total of 75 plots have been sampled. For species whose individuals had not been encountered in the plots (i.e. *Warburgia ugandensis* and *Citropsis articulata*), searches for their presence were done outside the plots. In addition to the field team, the search was guided by the National Forestry Authority's Patrol men due to their extensive knowledge about the forest.



Figure 2: The project team and an NFA staff laying transects and establishing study plots (Photo Credit: Benard Tumwekwatse)

2.1.3 The data collection process.

For each individual of the particular target species encountered, its location by forest type was established, coordinates of its specific location captured using a GPS device, Diameter at Breast Height (DBH) measured using a diameter tape, height measured using a clinometer and evidence of medicine extraction recorded (bark removal, root removal, plucking of leaves and cutting of the whole tree). The health status of the tree (whether healthy, poor health or dead) was also recorded and the plot's general topographic characteristics (Valley bottom, slope and hilltop) noted.



Figure 3: An assessment of debarked Xanthoxylum gilleti and Prunus africana trees, and a cut down Warburgia ugandensis tree in KCFR for medicinal purposes. (Photo Credit: Benard Tumwekwatse)

2.1.4 Summary of preliminary findings.

Prunus africana had the highest number of individuals (N=252), and most of them were located on the forest edge (N=98), had not attained a DBH (N=116), and were located on slopes (N=152) (Table 1). In the case of Xanthoxylum gilleti, there was a fairly even distribution in all forest types, majority of its individuals were in the 31-50 size class and most were located on slopes (58.0%). Most encountered Warburgia ugandensis individuals were located in interior closed parts of the forest (N=17) and were encountered on slopes (79.0%). No Citropsis articulata individuals had so far been encountered.

Species	Forest type		Size classes (DBH)(cm)					Topography			
name	Edge	Open interior	Closed interior	None	(1-10)	(11- 30)	(31- 50)	(>50)	Valley bottom	Slope	Тор
Prunus	98	67	87	116	28	34	36	38	14	152	86
africana									(5.5%)	(60.3%)	(34.2%)
Xanthoxylum	39	44	60	09	33	35	57	21	27	83	33
gilleti									(18.9%)	(58.0%)	(23.1%)
Warburgia	-	2	17	0	1	4	9	5	0 (0%)	15	4
ugandensis										(79.0%)	(21.0%)
Citropsis	-	-	-	-	-	-	-	-	_	-	-
articulata											

Table 1: Preliminary findings of the spatial (by forest type and topographic characteristics) and size class distribution of selected medicinal plant species in KCFR.

Bark removal was the most common method of herbal medicine extraction for all species, with root removal and cutting of parts or whole plants observed mainly on *Xanthoxylum gilleti* and *Warburgia ugandensis* trees (Table 2). Leaf extraction was only observed on trees of *Warburgia ugandensis* which also had the highest proportion of dead individuals, while most *Prunus africana* trees were found in good health.

Table 2: Status of utilization of selected medicinal plant species and their health in KCFR.

Species name	Utiliza	ation for 1	medicine ex	Health status			
	Bark removal	Root removal	Leaf extraction	Cutting of a tree /part	Good	Poor	Dead
Prunus africana	83	1	0	2	211 (83.7%)	30 (11.9%)	11 (4.4%)
Xanthoxylum gilleti	62	0	0	4	87 (60.8%)	41 (28.8%)	15 (10.4%)
Warburgia ugandensis	11	0	4	6	8 (42.1%)	5 (26.3%)	6 (31.6%)
Citropsis articulata	-	-	-	-	-	-	-

The spatial distribution and locations of the encountered target trees are illustrated in figure 5.



Figure 4: A map showing the spatial distribution of the target medicinal plants in the sampled areas of KCFR. (Credit: Benard Tumwekwatse)

The forest-based survey has not yet been completed as the project team had to halt it and first embark on raising seedlings in tree nurseries to take advantage of the then anticipated reliable rainfall during the March-April period. At that time, the forest-based wildings of *Prunus africana* and the rare *Xanthhoxylum gilleti* had to be collected and propagated in the tree nurseries since thy would otherwise be desiccated during the expected May-July dry season. Also, seeds of some target species were available in the forest then, had to be collected for propagation before losing their viability. The propagated seedlings require sufficient time to mature and get ready for the planned forest enrichment and community-based planting in the September–November period. Additionally, the field team was impeded by the invasion of elephants in the central parts of the forest at the time of the survey and have persisted there up to date. We will therefore complete the survey during the June-July period.

2.2 Preliminary community engagements and trainings (March 2025 – April 2025)

2.2.1 Engagements with Uganda National Forestry Authority (NFA) Staff

The project team engaged staff NFA to discuss the status of medicinal plants in Kalinzu Forest Reserve. These discussions primarily focused on the growing demand for herbal medicine and its resulting impact on forest degradation and were held with key personnel, including the NFA Range Manager for Southwestern Uganda, the Sector Manager of Kalinzu Forest, two forest supervisors from the Nkombe and Kalinzu beats, and several patrolmen. The two parties discussed the potential solutions to the overharvesting of key medicinal species including enrichment planting in degraded forest areas, collaborative community mobilization and sensitization, the establishment of community-managed nurseries for propagating threatened species and promoting the domestication of these plants by local communities.

2.2.2 Mobilization, Engagement, and Training of Local Community Members

As a strategy to effectively conserve threatened medicinal plant species in KCFR, the project team engaged local community members through their Local Council I chairpersons and other relevant authorities. These preliminary engagements targeted representatives from all visited villages, ensuring the inclusion of men, women, and youth. The primary goals included securing endorsements for hosting project activities, introducing project team members to local authorities, and building community ownership of conservation initiatives such as establishing and managing community tree nurseries.

In addition to village-level engagements, the project team also visited four schools in communities adjacent to KCFR. Similar discussions were held with school administrators, teachers and students to raise awareness about the increased use of herbal medicine and the growing threat to certain high-demand species. Proposed solutions included planting medicinal trees on school grounds and encouraging students, parents and teachers to do the same at home. Our idea of establishing school-based tree nurseries to ensure a steady supply of planting materials was welcomed in all schools, as these nurseries would also serve as part of the curriculum practices for some students.



Figure 5: Engagement of teachers at Mashonga Primary School through exploring the potential of the school's compound for tree planting. (Photo Credit: Benard Tumwekwatse)

2.3 Establishment of Community Tree Nurseries (March 2025 – Present)

The project has initiated the establishment of community-based and managed tree nurseries to support the conservation of highly threatened medicinal tree species. These nurseries aim to raise and provide seedlings for both the restoration of degraded forest areas and the domestication of medicinal species by local communities in their home gardens and farms.

2.3.1 Site Selection

Selecting appropriate sites for the nurseries was a critical step in ensuring successful propagation of medicinal tree seedlings. In collaboration with local leaders and community members in the target areas, three sites were identified based on key criteria including accessibility, proximity to water sources for irrigation, land availability, protection from disturbances and closeness to the forest reserve to ensure optimal growing conditions. This was also intended to promote community ownership and long-term sustainability.

The selected sites are referred to as; **Site 1** (Toro-Toro) located in the south of KCFR, **Site 2** (Kayanga) in the central area, and **Site 3** (Kyanika) in the north (Figure 7). In addition to village-based nurseries, at least three more nurseries will be established in the local schools including Ndekye Secondary school, Mashonga, Rutoto and Butinde Primary school.



Figure 6: Locations of the established community tree nurseries

2.3.2 Procurement of nursery supplies

To facilitate the efficient establishment of the community nurseries, the project team procured essential materials including soil potting bags, watering cans, hoes, timber offcuts, spades, crates for carrying seedlings, buckets and basins. Additionally, the project benefited from local collaborations, whereby some community members and local authorities contributed tools and equipment to support the nursery management activities.

2.3.3 Site preparation and development for establishment of nursery beds.

The nursery establishment activities commenced with preparing of nursery sites through clearing some on-ground vegetation, ground leveling and constructing nursery bed shades. Raised-ground seed beds were prepared to saw the procured seeds (through purchase and freshly collected from the forest) for germination. The shade structures were made from locally available materials such as wooden poles, banana pseudo stems and grass to protect young seedlings from excessive direct sunlight. This activity was conducted while providing training to some members of the local communities to skill them for managing the established nurseries and future undertaking of similar activities.



Figure 7: Preparation of sites during tree nursery establishment. (Photo credit: Benard Tumwekwatse)

2.3.4 Collection of soils to use in raising of seedlings.

Locally available fertile loamy soil mixed with organic compost from the forest was identified and collected to provide adequate nutrients for seedling growth. The collection of forest soils was authorized by the NFA. Sandy soils were also purchased and collected from private lands adjacent to the tree nursery sites. The soils were then mixed in appropriate rations according to the purpose and species to be raised. Soil sterilization was also done to minimize the risk of pests and diseases that could affect the survival of the young fragile seedlings.



Figure 8: Collection of forest soils suitable for raising tree seedlings of the target medicinal tree species. (Photo credit: Benard Tumwekwatse)

2.3.5 Soil potting in seedling pots.

The polythene bags/pots were adequately filled with soils to ensure uniform soil distribution, proper aeration, and optimal moisture retention.



Figure 9: Project team members demonstrating to local community members on appropriate soil potting techniques. (*Photo credit: Benard Tumwekwatse*)



Figure 10: Participation of some community members in soil potting operations at one of our established medicinal tree nurseries. (*Photo credit: Benard Tumwekwatse*)

2.3.6 Collection of seeds and seedlings/wildings of the target medicinal tree species.

Seeds and seedlings from selected mother trees within the forest and adjacent community areas were identified and collected. Priority was given to sourcing highquality seeds from mature, healthy trees. To date, more than 8,100 seedlings of *Prunus africana* have been successfully collected and propagated in tree nursery beds.



Figure 11: Project team and community members collecting wildings of Prunus africana for propagation in our established tree nurseries. (Photo credit: Benard Tumwekwatse)

For Xanthoxylum gilleti, our team, in collaboration with local community members, searched extensively within the forest reserve but found only a few wildings in eucalyptus plantations adjacent to the natural forest. The wildings were collected and introduced into our nurseries. Additionally, we purchased some seedlings from local seed collectors, and seeds have been sown in the nurseries, now awaiting germination and growth.



Figure 12: Collection of wildings of *Xanthoxylum gilleti* for propagation in our established community tree nurseries. (*Photo credit: Benard Tumwekwatse*)

Regarding Warburgia ugandensis, there were no mature seeds and wildings were encountered. Hence, we opted to purchase the established seedlings from professional tree nurseries. Similarly for *Citropsis articulata*, no individual plants were encountered within the forest and we also opted to purchase its seeds and seedlings as we are presently searching for its existing planting materials within the country.

2.3.7 Seed sowing and seedling propagation.

Following seed collection, sowing was conducted using scientifically recommended techniques to maximize germination success. Seeds of some species were pre-treated where necessary including soaking *Zanthoxylum gilleti* seeds in water for three days before sowing. The team ensured proper spacing and watering regimes to facilitate healthy seedling emergence and development. For wildings collected from the forest, they were transplanted/potted into the nursery beds.



Figure 13: Propagation of wildings collected from the forest in the established tree nurseries. (Photo credit: Benard Tumwekwatse)

2.3.8 Purchase of supplementary seedlings

In order to accumulate sufficient seedlings for our planned planting activities (in the forest and communities), we procured additional already established seedlings from a reputable tree nursery, at National Tree Seed Center - Banda, 358 kilometers away from the project area. Particularly, we purchased Warburgia ugandensis which could not otherwise be propagated locally. To date we have procured 549 seedlings of *Warburgia ugandensis* and we intend to purchase more for our planting purposes.



Figure 15: Procurement of Warburgia ugandensis seedlings from one of the National Tree Seed Centers, Banda Tree nursery. (Photo credit: Benard Tumwekwatse)



Figure 16: Management of the purchased seedlings of Warburgia ugandensis in our community tree nurseries. (*Photo credit: Benard Tumwekwatse*)

2.3.9 Tending to seedlings in the tree nursery beds.

Seedlings at different growth stages are undergoing several care practices, including watering, weeding, pest control, gap filling (replacing the dead and weak ones) and hardening off. The team have established a routine schedule for managing and monitoring the seedlings' growth and health.



Figure 17: Watering of the newly propagated medicinal tree seedlings. (*Photo credit: Benard Tumwekwatse*)

3.0 On-ging and upcoming activities.

As per the project objectives, expected outcomes, outcome indicators and the planned activities, some activities are being carried out while others will be embarked on between May and December 2025 (Table 3).

Project activity	Current activity	Planned timeline		
	status			
Establishment of tree nurseries	Ongoing	April – May 2025		
in schools.				
Community engagement and	On-going	March to September 2025		
trainings				
Raising Tree seedlings in	On-going	Continuous activity		
established nurseries				
Completing the forest based-	Pending	June – July 2025		
survey.				
In-forest restoration with	Awaiting	September 2025		
medicinal tree species				
(Enrichment planting)				
Community-based tree	Awaiting	Continuous activity		
planting				
Writing and compiling the	Awaiting	November – December 2025		
final project report.				

Table 3: Highlights of the ongoing and upcoming project activities.

Project Partners and supporters





