Project update: August, 2025


A protected Dombeya ledermannii wildling © Simon

Background

Dombeya ledermannii is a rare plant species found only in Nigeria (the Jos-Plateau and Mambilla-Plateau) and Cameroon (the Bamenda Highlands). It is critically endangered (CR) globally due to habitat loss and overexploitation for bast fibre (Cheek and Pollard 2000; Borokini, 2014). These threats are compounded by lack of knowledge of the plant ecology (local and scientific knowledge). For effective conservation intervention, knowledge of its ecology at small and large scale and awareness on the threats to the species are essential. This work is therefore driven by the need for information on the ecology of *D. ledermannii* needed for its immediate and long-term conservation and urgent conservation intervention/action for the species. This project is carried out in Amurum Forest Reserve (AFR) in one of *D. ledermannii* range of occurrence in Nigeria; the Jos Plateau. Preliminary field observation identified fire outbreak as a factor impeding the establishment of wildlings in AFR and fire outbreak and cutting as a factor impeding regeneration of wildlings from harvested adults around AFR. This project therefore aims to provide information on the ecology of *D. ledermannii* and create awareness on the threats facing the species while training field assistance and community volunteers (mainly Laminga community members farming around AFR) on monitoring of wildlings, in and around AFR.

Specific Objectives

The specific objectives of this project are;

1. To map the spatial distribution and determine the population density of *D. ledermannii* in Amurum Forest Reserve (AFR), Jos Nigeria.
2. Assess the soil nutrient characteristic/requirement and floral interactions of *D. ledermannii* in AFR.
3. Create awareness on the threats facing the species and initiate conservation actions (after training field assistance and community volunteers) to protect and monitor the establishment and regeneration of wildlings, in and around AFR respectively.

The objectives categorized the project into three phases and are carried out following the order listed above. However, we carried out the awareness campaign and training part of objective 3 at the same period with soil collection. This was to enable monitoring in January 2025 after knowing the distribution of *D. ledermannii* in AFR (Objective 1).

Table 1: Timeline of overall project activities

Note: the change in the project proposed date to the present date (working date) is because the grant was awarded in June, 2024, fund was received by my affiliate Institute in August 2024 and I received the fund from the institute by September 2024.

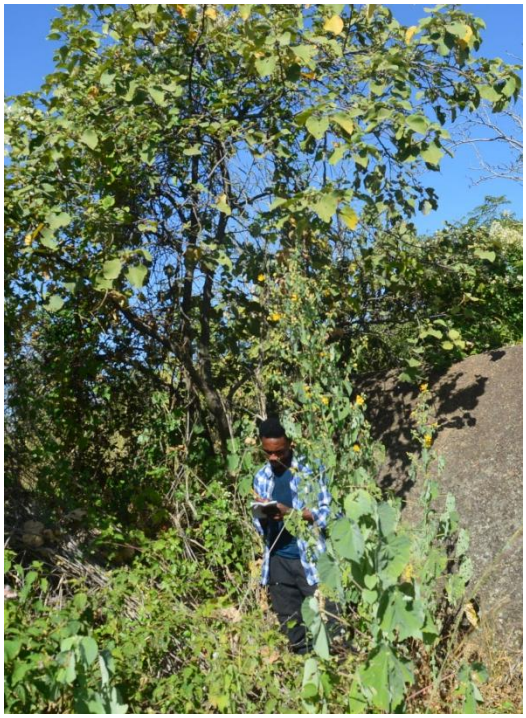
S/N	Activity	Proposed date	Working date	Status/Output
1	Meeting with APLORI management, head of Laminga community, community members farming around AFR and purchase of required field equipment	1week: 1st to 7th March, 2024	1 week: 23rd - 29th September, 2024	Done: The APLORI management and Laminga community gave approval to start the project. We purchased all required equipment.
2	Field work for mapping the spatial distribution and determination of population density of *D. ledermannii* in AFR	3 months: 2nd week of March 2024 to 2nd week of June 2024	3 months: 1st October, 2024 to 20th December, 2024	Done: we have now produced the spatial distribution map of *D. ledermannii* and determined it population density (1 *D. ledermannii*/hectares) in AFR.
3	Field work for the collection of soil samples for laboratory analysis, and determination of floral interactions of *D. ledermannii in AFR*	2 months: 3rd week of June to 3rd week of August, 2024	2 months: 13th January, 2025 to 13th March, 2025	Done: we have collected soil samples and have carried out laboratory analysis. The interaction of *D. ledermannii* with other plants in AFR have been assessed.
4a	Conservation awareness on the local threats facing the species in Laminga community bordering the AFR and training of field assistance and community	1 year: June 2024 to June 2025	January 2025	Done: 309 persons (157 males and 152 females) reached on the ecosystem importance and

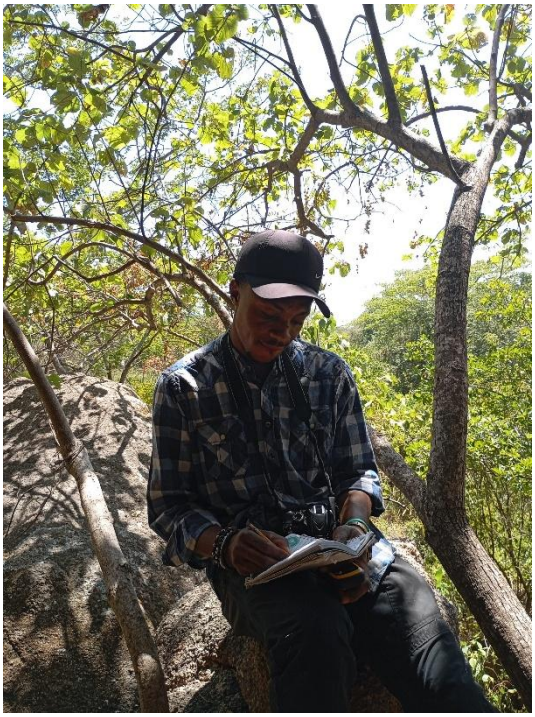
	members on monitoring protocols.			threats to *D. ledermannii*. 43 individuals (28 males & 15 females) trained.
4b	Protection and monitoring of wildlings, in and around AFR against fire and exploitation.	1 year: June 2024 to June 2025	1 year: January 2025 to December 2025	293 *D. ledermannii* (adults and wildlings) monitored in and around AFR and this will continue till December, 2025

Method used

Spatial distribution and population density of *D. ledermannii* in AFR

We generated 50 random plots of 100 m X 100 m within AFR in ArcGIS. In each plot, we surveyed and counted the number of wildlings and adult of *D. ledermannii* and took the geographical coordinate of each located individual (both wildlings and adults) to produce a heat map of the spatial distribution of *D. ledermannii* in ArcGIS. In addition to the generated plots, we were able to survey the entire AFR (c. 300 ha). To determine the population density of the species in AFR, we divided the total number of *D. ledermanni* (wildlings and adults) by the total area surveyed (300 hectares).





Under a *D. ledermannii* during survey for spatial distribution and population density assessment

Soil nutrient characteristic/requirement and floral interactions of *D. ledermannii* in AFR

We collected soil around 20 *D. ledermannii* and from an equal number of random, paired, location without *D. ledermannii* in AFR Using a soil auger at a depth of 15 cm. The soil samples were analysed for Ph, Electrical conductivity, Organic Carbon, Organic Matter, Exchangeable Acidity, Cation Exchange Capacity, percentage Nitrogen, Phosphorus and Potassium.

Within a 10 m X 10 m plots around each of the 20 selected *D. ledermannii*, we assessed the species composition of woody plant and their abundance. The species composition of woody plant and their abundance in 20 random-paired 10 m X 10 m plots without *D. ledermannii* was also assessed.

During soil sample collection and assessment of floral interaction

Awareness campaigns on the ecosystem importance and threats to *D. Iedermannii*

We held meetings with men and women of various occupations in Laminga community to raise awareness of the ecosystem's importance and threats facing *D. Iedermannii* using posters and banners, written in local dialect. A session of the awareness was carried out in local dialect by one of the community volunteers who has been involved in *D. Iedermannii* conservation.

A sample of banner and handbill used for awareness (left) and a community volunteer (right) chairing a session during the awareness campaign

Protection and monitoring of *D. Iedermannii* in and around AFR

To achieve this, we trained APLORI'S field assistant, interns and community members on monitoring protocols. After identifying priority sites in AFR, we cleared grasses around each wildling and mounted a basket mesh to identify them as species of conservation concern, protect them against fire outbreak and monitor their establishment for a year. Furthermore, weekly monitoring of the regeneration of wildlings against fire and further cutting including the adults by the trained personnel was carried out in and around AFR. We followed the BirdLife International (2006), Important Bird and Biodiversity Areas (IBAs) monitoring protocols with modification during weekly patrol.

During training on monitoring protocol

During training and subsequent weekly monitoring

Output of project activities

Based on absolute survey of the entire Amurum Forest Reserve in addition to the generated plot, we recorded 115 adults *D. ledermannii* and 66 wildlings. The heat map of spatial distribution of the species shows three hotspots within the AFR (Figure 1). They are about 1 *D. ledermannii* plant per hectare of land in AFR.

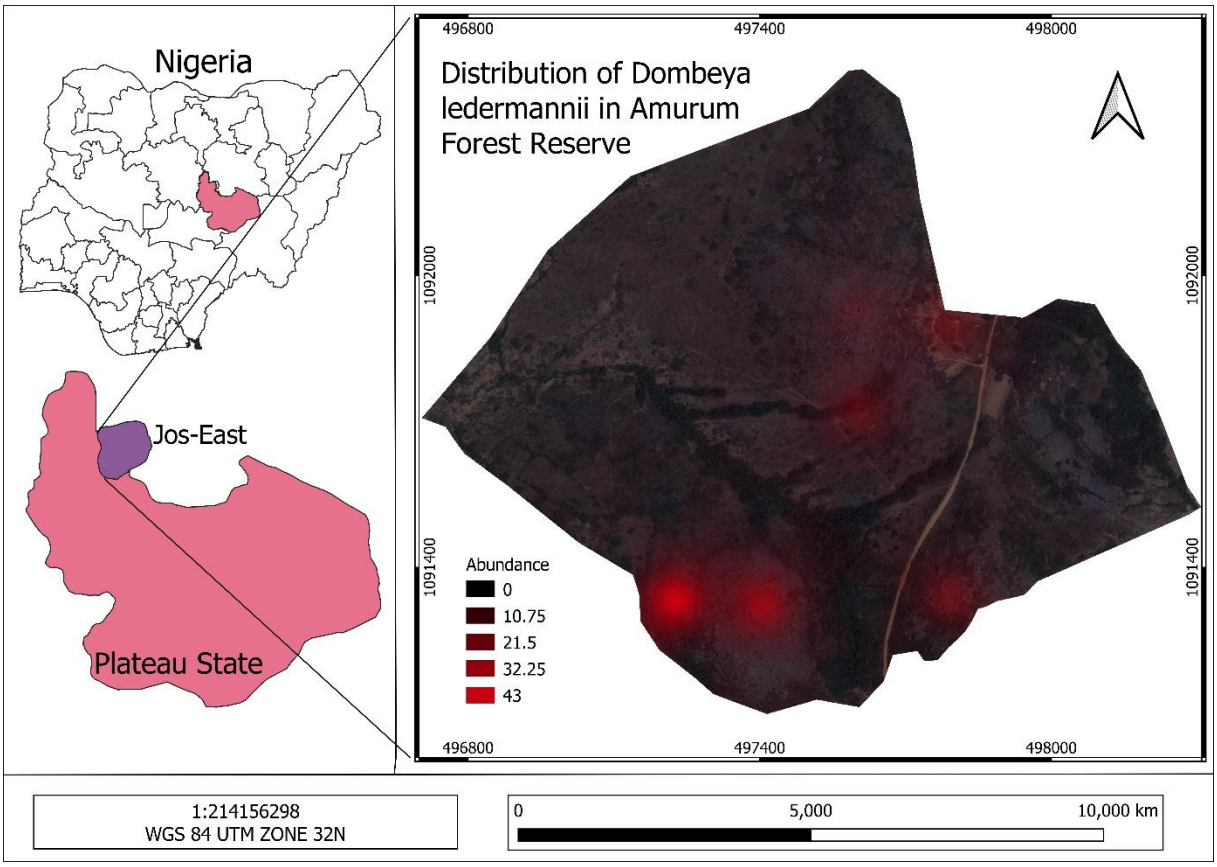


Figure 1: Interpolated (abundance heat map) spatial distribution map of Dombeya ledermannii in Amurum Forest Reserve, Nigeria.

Soil nutrient characteristic/requirement and floral interactions of *D. Iedermannii* in AFR

Highlights of preliminary findings;

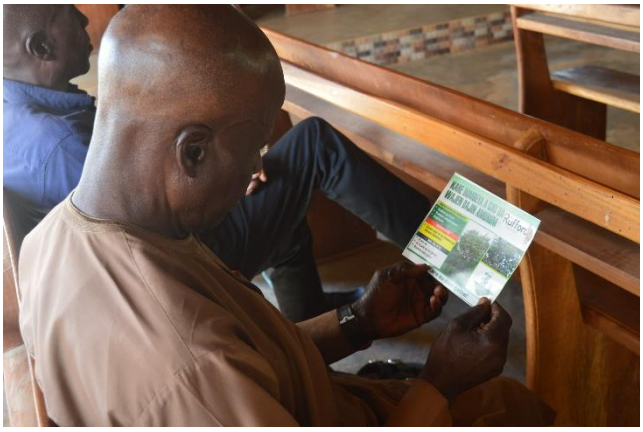
Compared to random sites, *D. Iedermannii* are found on sandy-loamy soil along gallery forest and on and around rocky habitats with;

1. Higher pH
2. Higher Electrical Conductivity
3. Higher Organic Carbon
4. Higher Organic Matter
5. Higher Percentage Nitrogen
6. Higher Phosphorus
7. Higher Potassium
8. Similar Sodium
9. Higher Calcium
10. Higher Magnesium
11. Similar Exchangeable Acidity
12. Similar Cation exchange capacity

D. Iedermannii are found along with other woody species notably *Ficus* spp, *Croton zambesicus*, *Albizia* spp, *Dichrostatchys cinerea*, *Anona* spp etc.

Awareness of the ecosystem importance and threats to *D. ledermannii*

Two (2) banners and 500 handbills produced and distributed during and after awareness campaigns. A total of 309 persons (157 males and 152 females) reached on the ecosystem importance threats to *D. ledermannii* in Laminga community.



Community members reached on the ecosystem importance and threats to *D. ledermannii*

Protection and monitoring of wildlings of *D. ledermannii* in and around AFR

We trained 43 individuals (28 males & 15 females) comprising of APLORI'S field assistant, master's students, interns and community volunteers on *D. ledermannii* monitoring in and around AFR. Customized T-chirt was distributed to the trainees to increase awareness on the conservation of *D. ledermannii*. From January to date, 115 adults and 66 wildlings in the AFR, 78 adults and 41 wildlings around AFR have been monitored through weekly patrols. Sadly, 4 adults and 6 wildlings that were too big for a basket mesh protection in AFR were affected by an uncontrollable fire incidence that happened in March, 2025. Furthermore, 2 adults and 5 wildlings were cut down around the AFR.

Individuals trained on *D. ledermannii* monitoring

***D. iedermannii* wildlings protected in Amurum Forest Reserve**

Update of activities carried out.

The activities carried out so far are for all the objectives of the project. However, weekly monitoring of wildlings in and around AFR continues till December 2025.

References

Borokini, T. I. (2014). A systematic compilation of IUCN red-listed threatened plant species in Nigeria. *International Journal of Environmental Sciences*, *3*(3), 104-133.

Cheek, M. and Pollard, B.J. (2000). *Dombeya ledermannii*. The IUCN Red List of Threatened Species 2000: Cheek, M.; Pollard, B.J. (2000). e.T39747A10262363. doi:10.2305/IUCN.UK.2000.RLTS.T39747A10262363.en

APPENDIX

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MONITORING DOMBEYA LEDERMANNII AGAINST FIRE INCIDENCE AND EXPLOITATION IN AND AROUND AMURUM FOREST RESERVE (AFR), JOS PLATEAU, NIGERIA

Baseline Population data of *D.ledermannii* and scale of local threats		
Location	Overall Baseline population of *D.ledermannii*	Baseline summary of the scale of local threats
AFR	115 adults / 66 wildlings	Risk of fire incidence in dry season
Around AFR	78 adults / 41 wildlings	On-going exploitation and risk of fire

Monitoring			**Name of observer:** Azang			
Location: AFR	**Baseline Population:** 25 adults / 37 wildlings		**Date:** 11/01/25			**Week:** 1
Habitat within the location: A **Remaining population:** 25 adults / 37 wildlings **THREAT TYPES**			**Score**			**Details**
			Timing	**Scope**	**Severity**	No fire No exploitation
1. Fire incidence			4	4	4	
2. Exploitation for fire wood and other uses			4	4	4	
Location: AFR	**Baseline Population:** 23 adults / 4 wild		**Date:**			**Week:**
Habitat within the location: B **Remaining population:** 23 adults / 4 wildlings **THREAT TYPES**			**Score**			**Details**
			Timing	**Scope**	**Severity**	Risk of fire in dry season No exploitation
1. Fire incidence			2	4	4	
2. Exploitation for fire wood and other uses			4	4	4	

Note: AFR = Amurum Forest Reserve, AAFR = Around Amurum Forest Reserve

Guidelines to score the local threats to *D. ledermannii*: Score each threat based on your weekly observations of what is happening around and to *D. ledermannii* and its habitat, and scored for Timing, Scope and Severity. In the 'details' column, please make any other relevant comments and note any changes in individual threats since the last visit. Use the following guidelines to assign scores for Timing, Scope and Severity of the threat.

Note:

1. Fire incidence: Anthropogenic fire that convert or degrade the habitat of *D. ledermannii* or burn *D. ledermannii* (with focus on wildlings).

2. Exploitation for fire wood and other uses: Threats from consumptive use of *D. ledermannii* resources including both deliberate and unintentional harvesting effects; e.g., firewood collection, leaves collection, debarking, clear cutting, selective logging, charcoal production etc.

Timing of selected threat	**Timing score**
Not happening now	4
Happening now	3
Likely in short term (within 4 months)	2
Likely in long term (beyond 4 months)	1
Past (unlikely to return) and no longer limiting	0

Scope of selected threat	**Scope score**
No area or Dombeya population is affected	4
Whole area or Dombeya population (>90%)	3
Most of area or Dombeya population (50-90%)	2
Some of area or Dombeya population (10-50%)	1
Small area or few individual Dombeya (<10%)	0

Severity of selected threat	**Severity score**
No deterioration currently	4
Rapid deterioration (>30%)	3
Moderate deterioration (10–30%)	2
Slow deterioration (1–10%)	1

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Baseline Population data of *D.ledermannii* and scale of local threats		
Location	Overall Baseline population of *D.ledermannii*	Baseline summary of the scale of local threats
AFR	11 [illegible] wildlings	Risk of fire in dry season
Around AFR	[illegible] wildlings	[illegible] evidence of fire

Monitoring — **Name of observer:** Azang

Location: AFR	**Baseline Population:** 68 adults/25 wildlings	**Date:** 11/01/25	**Week:** 1

Habitat within the location: C **Remaining population:** 68 adults/25 wildlings **THREAT TYPES**	**Score**			**Details**
	Timing	Scope	Severity	No fire No Exploitation
1. Fire incidence	4	4	4	
2. Exploitation for fire wood and other uses	4	4	4	

Location: AAFA	**Baseline Population:** 78 adults/41 wildlings	**Date:**	**Week:**

Habitat within the location: All habitat **Remaining population:** 78 adults/41 wildlings **THREAT TYPES**	**Score**			**Details**
	Timing	Scope	Severity	Risk of fire Exploitation going on
1. Fire incidence	2	4	4	
2. Exploitation for fire wood and other uses	3	1	2	

Note: AFR = Amurum Forest Reserve, AAFR = Around Amurum Forest Reserve

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Note:

1. Fire incidence: Anthropogenic fire that convert or degrade the habitat of *D. ledermannii* or burn *D. ledermannii* (with focus on wildlings).

2. Exploitation for fire wood and other uses: Threats from consumptive use of *D. ledermannii* resources including both deliberate and unintentional harvesting effects; e.g., firewood collection, leaves collection, debarking, clear cutting, selective logging, charcoal production etc.

Timing of selected threat	**Timing score**
Not happening now	4
Happening now	3
Likely in short term (within 4 months)	2
Likely in long term (beyond 4 months)	1
Past (unlikely to return) and no longer limiting	0

Scope of selected threat	**Scope score**
No area or Dombeya population is affected	4
Whole area or Dombeya population (>90%)	3
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Severity of selected threat	**Severity score**
No deterioration currently	4
Rapid deterioration (>30%)	3
Moderate deterioration (10–30%)	2
Slow deterioration (1–10%)	1

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Baseline Population data of *D.ledermannii* and scale of local threats		
Location	Overall Baseline population of *D.ledermannii*	Baseline summary of the scale of local threats
AFR	115adults / 66 wildlings	Risk of fire in dry season
Around AFR	78 adults / 41 wildlings	on-going Exploitation & risk of fire

Monitoring		Name of observer: SOLO				
Location: AFR	**Baseline Population:** 25A/37W	**Date:** 2/8/25			**Week:** 30	
Habitat within the location: A **Remaining population:** 25A/37W		**Score**			**Details**	
THREAT TYPES		Timing	Scope	Severity	NO fire NO Exploitation	
1. Fire incidence		4	4	4		
2. Exploitation for fire wood and other uses		4	4	4		
Location:	**Baseline Population:** 23adults/4wild	**Date:**			**Week:**	
Habitat within the location: B **Remaining population:** 23A/4W		**Score**			**Details**	
THREAT TYPES		Timing	Scope	Severity	NO fire No exploitation	
1. Fire incidence		4	4	4		
2. Exploitation for fire wood and other uses		4	4	4		

Note: AFR = Amurum Forest Reserve, AAFR = Around Amurum Forest Reserve

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Location	Overall Baseline population of *D.ledermannii*	Baseline summary of the scale of local threats
AFR		
Around AFR		

Monitoring			Name of observer: Bolo			
Location: AFR	**Baseline Population:** 68A/25W		**Date:** 2/8/25			**Week:** 30
Habitat within the location: C **Remaining population:** 68A/25W **THREAT TYPES**			**Score**			**Details**
			Timing	Scope	Severity	
1. Fire incidence			4	4	4	No fire
2. Exploitation for fire wood and other uses			4	4	4	No exploitation
Location: AAFR	**Baseline Population:** 78A/41W		**Date:** 2/8/25			**Week:** 30
Habitat within the location: All habitat **Remaining population:** 76A/36W **THREAT TYPES**			**Score**			**Details**
			Timing	Scope	Severity	
1. Fire incidence			4	4	4	NO fire
2. Exploitation for fire wood and other uses			3	4	4	Risk of exploitation

Note: AFR = Amurum Forest Reserve, AAFR = Around Amurum Forest Reserve

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Note:

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No deterioration currently	4
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A land owner around the Amurum Forest Reserve