

Kuzuko Lodge Private Game Reserve Thicket Restoration Project

Project Summary

SPEKBOOM TRADING (PTY) LTD.

Document Prepared By: C4 EcoSolutions



Project Title	Kuzuko Lodge Private Game Reserve Thicket Restoration Project
Version	02
Date of Issue	
Project Location	Eastern Cape Province, South Africa
Project Proponent(s)	Spekboom Trading (Pty) Ltd. Professor Anthony Mills Anthony.mills@c4es.co.za info@c4es.co.za sellers@asterglobal.com +27 21 712 0282
Validation Body	Aster Global, Caitlin Sellers, , 330 294 1242 ext. 107
Project Lifetime	01 January 2014 – 31 December 2067; 54-year lifetime
GHG Accounting Period	01-01-2023 – 31-12-2067; 50-year total period
History of CCB Status	7 September 2013
Gold Level Criteria	Biodiversity Gold & Climate Gold
Expected Verification Schedule	May 2023

Table of contents

1. Relevant background of Thicket and <i>Portulacaria afra</i>	2
2. Description of the Project.....	2
3. Project proponent.....	4
4. Project Benefits.....	5
5. Project Objectives and Activities	5
6. Grievance mechanism	7
7. Climate, Community and Biodiversity benefits.....	8
8. Climate and Biodiversity Gold	13

Relevant background of Thicket and *Portulacaria afra*

The historical degradation of Albany Subtropical Thicket, largely through over-browsing by domestic herbivores, has resulted in a substantial loss of native plant biomass. This has, in turn, led to soil erosion, decreased water availability, and diminished livelihood viability. Although thicket has co-evolved with herbivory, the biome is less resilient to domestic herbivory, particularly on *Portulacaria afra* Jacq. (*P. afra*). However, the natural recovery of degraded thicket is limited because of the current environmental conditions. *Portulacaria afra*, a large succulent of the Didieraceae family, acts as a pioneer species and ecosystem engineer in succulent thicket habitats and is purported to be the main element in thicket restoration. In thicket, *P. afra* acts as an ecosystem facilitator by producing large amounts of leaf litter, trapping water, and reducing soil erosion, cumulatively improving the germination and establishment of other thicket trees, shrubs, and succulents. In addition, *P. afra* sequesters substantial amounts of carbon, and restoration of degraded thicket ecosystems using its cuttings has been shown to drastically increase above- and below-ground carbon.

Description of the Project

The proposed VCS project under Agriculture, Forestry and Other Land Uses (AFOLU) subcategory Afforestation, Reforestation and Revegetation (ARR) aims to enhance Climate, Community and Biodiversity (CCB) by restoring degraded thicket in the Eastern Cape of South Africa by planting *P. afra* cuttings in moderately and severely degraded areas (Figure 1). The project site, Kuzuko Lodge Private Game Reserve project area, includes approximately 12,000 ha of game-fenced area (referred to as “the reserve”) and an additional 4,000 ha of low-fenced land outside of the reserve (Figure 2). The project area borders the Addo Elephant National Park, one of the largest national parks in South Africa. It incorporates stretches of pristine vegetation among vast stretches of degraded land previously used for livestock farming. According to the Subtropical Thicket Ecosystem Programme (STEP) and further vegetation degradation assessment, there is approximately 6,800 ha of thicket, 5,185 ha of which is suitable for planting (Figure 3). The project, funded by Reforest’Action and supported by C4EcoSolutions and KLPGR management, will run for 50 years from 2014 to 2064, with AfriCarbon overseeing implementation and monitoring. The objectives of the project include planting approximately 5,185 ha of thicket with *P. afra* cuttings, removing 2.4 million t CO₂e from the atmosphere, creating 350 jobs in a province with a 42.8% unemployment rate, increasing biodiversity and improving ecosystem services by enhanced carbon sequestration, soil quality, canopy cover, water retention and increasing flora and fauna in the area.

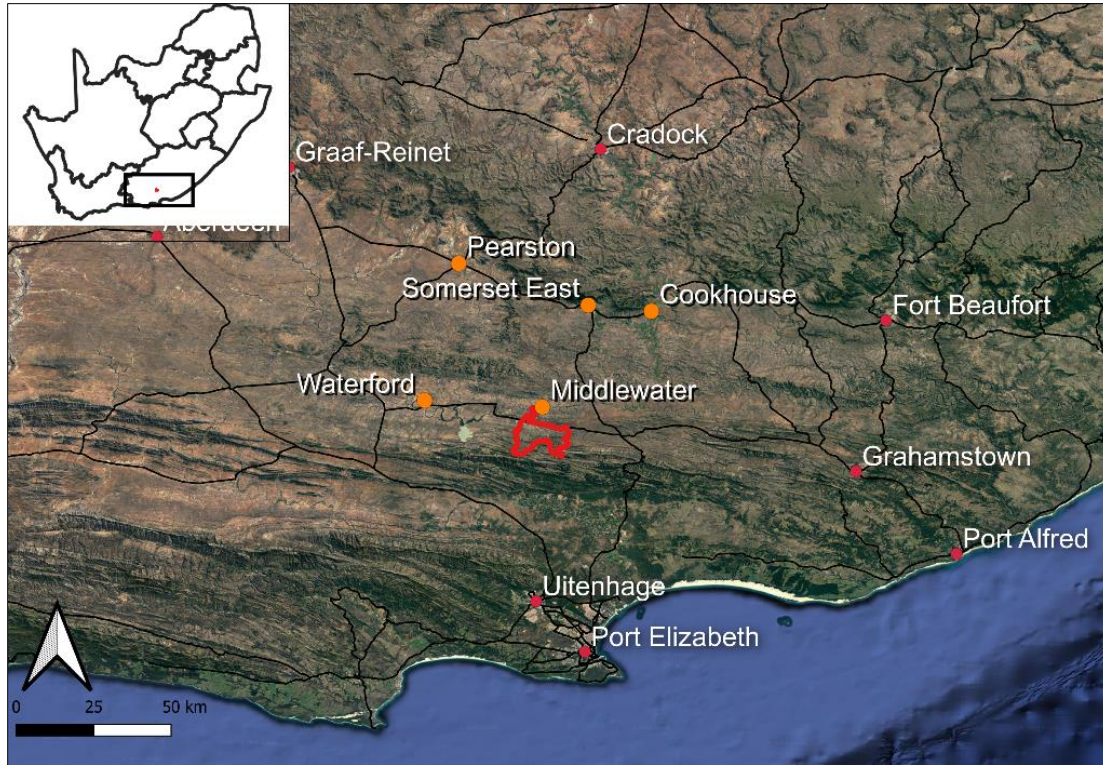


Figure 1. Geographic location of the proposed ARR project area in the Eastern Cape, South Africa.

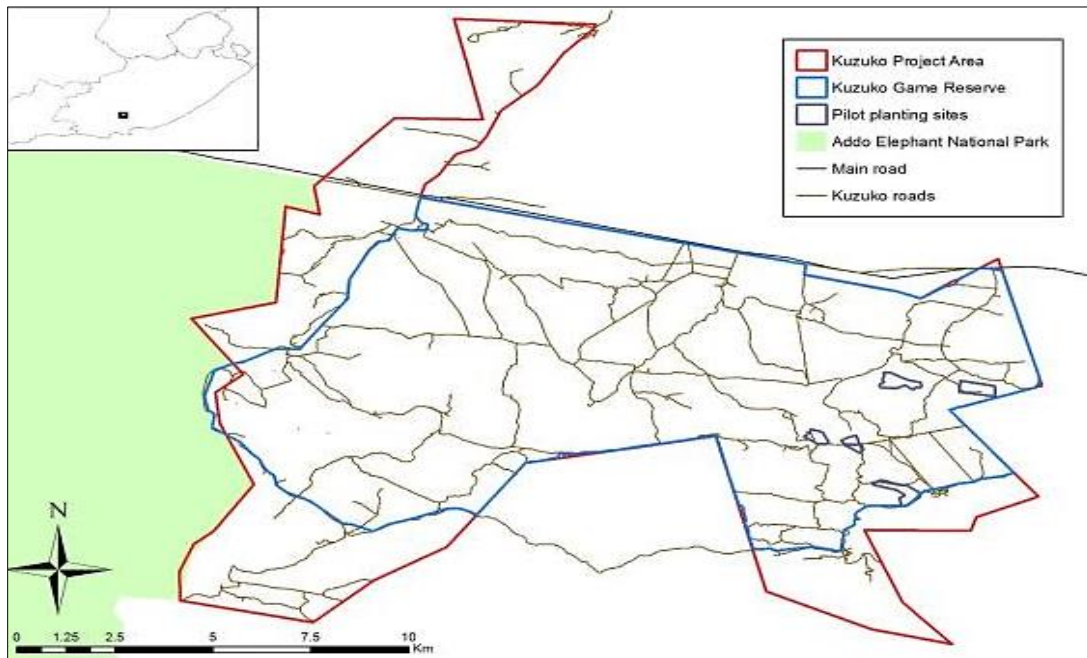


Figure 2. Kuzuko project area in Eastern Cape, South Africa - project area (red), game reserve boundary (blue), pilot planting sites (purple).

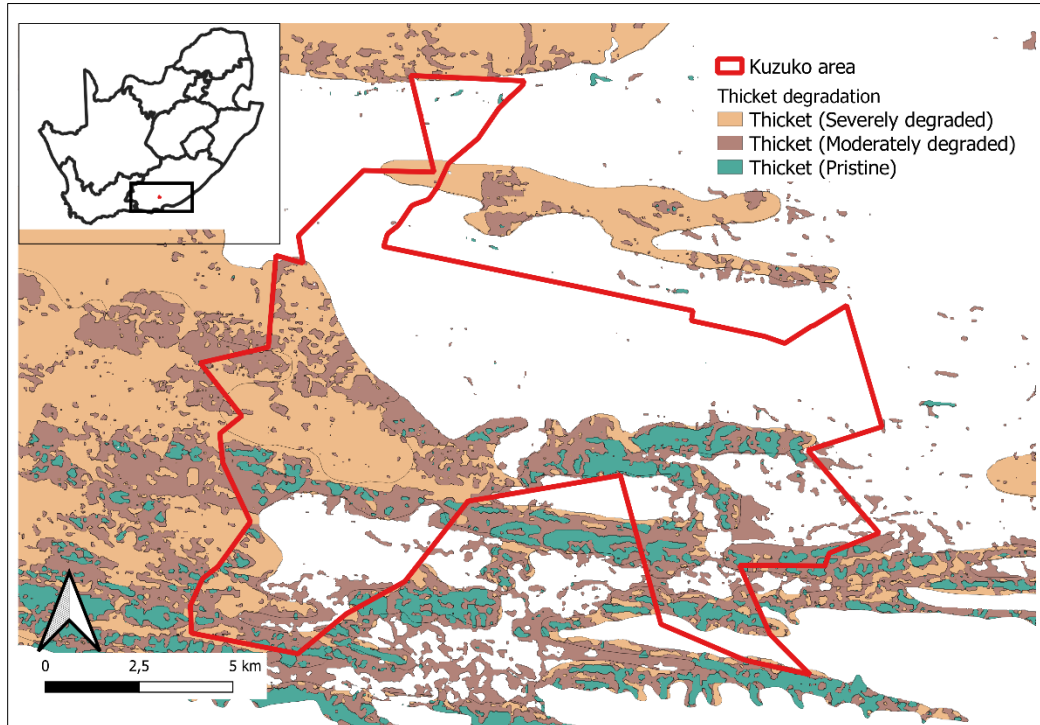


Figure 3. Thicket degradation within the project area

Project proponent

Spekboom Trading (Pty) Ltd. is a joint venture between AfriCarbon (Pty) Ltd. and Inqo Investments (Pty) Ltd. This company will manage the restoration project, assisted by the management of Kuzuko Lodge. It will issue contracts for the planting and blanking of the restoration area within KLPGR, and will ensure the quality of the planting, and will market the verified carbon credits registered on a VCS-approved market.

Organisation name	Spekboom Trading (Pty) Ltd.
Contact person	Anthony Mills
Title	Professor
Address	Gerrie Avenue, Tokai, 7945 Cape Town, South Africa
Telephone	+27 21 712 0282
Email	Anthony.mills@c4es.co.za

Project Benefits

Unique Project Benefits	Aspect
Reducing soil erosion and stabilising slopes by planting <i>P. afra</i> cuttings.	Climate
Improving the functioning of the project area as a water catchment to supply high-quality water to downstream dams.	Climate
Contributing to local capacity building, environmental education, awareness, and knowledge transfer.	Community
Creating skilled and unskilled employment opportunities for workers to plant the <i>P. afra</i> cuttings.	Community
Increasing biodiversity — particularly in shrub and tree diversity and wild game by increasing the browsing potential of the project area.	Biodiversity

Project Objectives and Activities

Climate objectives:

1. To contribute to the removal/reduction of GHG in the atmosphere.
2. Improving soil physical properties
3. Improving soil hydraulic properties and reduced erosion
4. Project area stratification

Community objectives:

- Community engagement and development.
- To improve the livelihoods of the community.
- Contributing to local capacity building, environmental education, awareness, knowledge exchange, and local youth development.

Biodiversity objectives:

- Restoring moderately and severely degraded thicket with spekboom cuttings

- Improving biodiversity
- Increasing High Conservation Value (HCV) area/diversity
- Increasing pollinator species presence.

Table 1. The summarized project activities of the Kuzuko Lodge Private Game Reserve Thicket Restoration Project with associated monitoring of the activities.

Activity	Description	Monitoring
Climate		
Carbon stock monitoring	Monitoring of above- and below-ground biomass, veld fires, and soil properties. Assessing the removal of CO ₂ from the atmosphere by planting <i>P. afra</i> , and the return of ecosystem carbon.	Regular monitoring of above- and below-ground biomass, and veld fires. No monitoring of baseline required.
Improving soil properties	Restoration of degraded lands using <i>P. afra</i> to improve soil water infiltration and reduce soil compaction caused by drought, floods, and soil erosion.	Assessment of soil properties, including soil volume, weight, and changes in water holding capacity.
Land cover mapping	Mapping of project area using drone and historical imagery, geological maps, and vegetation surveys to aid in site selection for thicket restoration.	Mapping will be updated to assess the impacts of restoration activities.
Community		
Stakeholder consultation	Regular bi-annual public meetings and open communication to discuss project activities, adaptation, and acceptance with reserve staff, neighbouring landowners, planting workers, AfriCarbon staff, and workforce.	Regular stakeholder surveys to monitor impact on environment and track changes in biodiversity, water, soil, and conservation/restoration knowledge.
Employment of local contractors	Hiring approximately 350 workers from surrounding towns to undertake harvesting, planting, and nursery plant establishment of <i>P. afra</i> cuttings.	Employment records are stored and maintained by the labour provider of the project. These records are corroborated by AfriCarbon
Training contractors and sharing knowledge	Building local capacity through workers' training and environmental education to improve forestation technical aspects, create gender equality	Training events and registered will be stored in training database. Training events will be conducted frequently ensuring that new staff members are

	and improve standard of living for surrounding communities.	sufficiently trained and that training stays up to date.
Investment into Kuzuko Foundation Trust	Establishing KFT to create employment opportunities for local communities. Educating local communities and youth on environmental issues and conservation.	Impact monitoring will be conducted by AfriCarbon. Frequent updates from the KFT will
Biodiversity		
Planting of <i>P. afra</i>	Planting of <i>P. afra</i> cuttings to restore both moderately and severely degraded thicket vegetation.	Planting sites selected based on aerial imagery and on-the-ground assessments by experts. Spekboom Trading inspects planting sites. AfriCarbon inspects planting sites to ensure correct methods are used and results are satisfactory.
Selection of planting sites	Planting sites for <i>P. afra</i> selected based on aerial imagery and verified through on-the-ground assessments by experts.	Size of planting sites not fixed but typically 5 ha over two days by a group of 10 people. Approved by KLPGR management. Planting sites selected and inspected by Spekboom Trading.
Harvesting of <i>P. afra</i> cuttings	Harvesting of <i>P. afra</i> cuttings done from intact thicket within 50 km of each planting site to reduce risk of genetic pollution. Cuttings are 200-400 mm in length and around 10-15 mm in stem diameter, selected for their green color.	Harvesting done sustainably, with no more than 30% of branches removed from a single source plant to prevent ecosystem damage.
Planting of <i>P. afra</i> plants	Cuttings of <i>P. afra</i> (200-400mm long, 10-15 mm in stem diameter) planted using four-person teams.	Supervisor performs quality control to maintain planting depth and spacing. AfriCarbon inspects planting sites to ensure correct methods are used and results are satisfactory.
Supplemental planting of <i>P. afra</i> cuttings	Supplemental planting (also known as “blanking” or “inboeting”) done to replace dead cuttings.	Survival rate monitored annually by AfriCarbon to determine need for supplemental planting.
Habitat conservation, management, and biodiversity monitoring	ARR project aims to restore degraded thicket, increasing biodiversity and benefiting surrounding communities.	Biodiversity monitoring done to track changes in soil, water, floral and faunal diversity, HCVs, and pollinator presence. Utilization of the restored area is not permitted.

Grievance mechanism

The grievance mechanism for the proposed project aims to ensure that all stakeholders have a platform to raise their concerns or grievances and that these concerns are addressed in a timely and fair manner. The mechanism includes the following steps:

Biannual meetings: Project management, neighbors, and identified regional stakeholders will meet every six months to discuss project progress and address any concerns or questions raised by stakeholders. Minutes of these meetings will be recorded, including any grievances raised.

Grievance submission: Stakeholders can submit grievances to Mr. Christopher Bertie, Operations Executive for Inqo responsible for KPLGR, at any time. Contact details for Mr. Bertie, including email address and telephone number, will be made available to all relevant stakeholders.

Grievance handling: A participant should bring the grievance to the attention of the project manager, either in writing or verbally. The project manager must listen to the submission of the participant and attempt to settle the matter by discussion within five days. If the matter cannot be resolved to the satisfaction of the participant, the project manager may investigate or enquire where affected parties can make submissions. The project manager must then notify the grievant and any other affected person of the decisions within a reasonable time. All grievances and responses will be documented.

Third-party mediator: If the initial project management responsibilities cannot satisfactorily address the grievance, a third-party mediator will manage the grievance.

Escalation: Should grievances still occur that cannot be mediated or addressed by the project management or relevant stakeholders, relevant and competent local authorities and court can be consulted to address the grievance and ensure that the most equitable outcome is reached.

Documentation: All feedback, grievances received, and relevant solutions shall be recorded and summarized in the project monitoring report. All project documents will be published on the VERRA registry and the AfriCarbon website for downloading. Furthermore, all the project documents will be provided at stakeholder engagements upon request.

The proposed grievance mechanism aims to promote transparency and accountability while ensuring that all stakeholders have a voice in the project's development.

Climate, Community and Biodiversity benefits

Climate

The change in carbon stocks is one of the crucial elements to the project's climate benefits, and this will be monitored frequently across the fifty-year project lifetime. Carbon levels will be monitored in above-ground *P. afra* biomass, deadwood, leaf litter and soil across multiple strata. For above-ground carbon monitoring, permanent plots will be used for the duration of the project's lifetime (Table 1). *P. afra* biomass will be measured through stem diameter measurements and linked to changes in the carbon stocks. A similar approach will be taken to measure dead wood, and leaf litter within the permanent plot, with leaf litter measured by mass in a 30 cm circular frame and dead wood measured using 50 m long transects. Additionally, monitoring of veld fires will be

assessed to determine the loss of biomass and carbon total GHG emissions released. Monitoring will be done after each veld fire event and will constitute the mapping of burnt area and tree biomass lost.

The mapping of the project area will be done initially using current drone imagery and compared to historical imagery combined with geological maps. This — as well as ground truthing and vegetation surveying — will aid in site selection for thicket restoration. These maps will be updated to assess the impacts of restoration activities.

Without project activities, carbon levels are expected to remain stable across the project lifetime despite the area being used for conservation. This is mainly due to the degraded thicket's low regeneration capacity, even with controlled herbivore stocking densities. In addition, irregular rainfall patterns and drought frequency accentuated by climate change heavily affect the livelihood sustainability of communities in the area. Restoration of thicket may alleviate these effects by stabilising soils, increasing water penetration, and reducing soil temperature.

Table 2. Cumulative totals for carbon sequestration for each carbon pool in the entire project area over the project duration by year (t CO₂e).

Year	Trees	Shrubs	Litter	Deadwood	Soil	Emissions	Net sequestration
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	11,735.3	0.0	0.0	0.0	32,266.7	0.0	44,002.0
10	38,779.8	0.0	0.0	0.0	108,313.3	0.0	147,093.1
15	116,705.3	0.0	0.0	0.0	184,360.0	0.2	301,065.1
20	319,888.5	0.0	0.0	0.0	260,406.7	0.5	580,294.7
25	741,925.0	0.0	0.0	0.0	304,186.7	1.2	1,046,110.4
30	1,319,779.9	0.0	0.0	0.0	304,186.7	2.7	1,623,963.8
35	1,772,519.2	0.0	0.0	0.0	304,186.7	4.9	2,076,700.9
40	1,984,153.2	0.0	0.0	0.0	304,186.7	7.6	2,288,332.3

45	2,056,127.0	0.0	0.0	0.0	304,186.7	10.4	2,360,303.3
50	2,077,536.6	0.0	0.0	0.0	304,186.7	13.2	2,381,710.1

Community

Communities surrounding the project area include small towns with low employment and education levels, such as Jansenville, Kirkwood, Klipplaat, Somerset East, Pearston, Addo and Paterson, and smaller farms and farming communities. These are all regarded as important stakeholders in the project. Additional to the socio-economic issues mentioned above, degradation in the area has decreased the viability of farming. This project directly addresses unemployment in the surrounding areas by hiring community members and increasing business and livelihood opportunities. Specific equal-opportunity processes for the hiring procedure will be implemented for vulnerable groups such as women, youth and the disabled. The climatic effects of thicket restoration will benefit stakeholders by mitigating the effects of drought through improving soil infiltration and water retention within the hydrological system and stabilising soils. Subsequently, biodiversity and biomass will increase within the landscape, increasing the land's carrying capacity. This will help improve the farming opportunities within the farming community and provide an alternative livelihood option through the carbon market. Direct community benefits will be monitored through the circulation of structured questionnaires targeting current and former staff hired from the local communities. At the same time, baseline and monitoring of the surrounding landowners' perceptions of the project will be tracked through questionnaires and localised community meetings. The questionnaires, particularly those aimed at the hired staff, will seek to establish and track the worker's knowledge of conservation, socio-economic status, skills, well-being, and job satisfaction. The community objectives of this project aim to improve human capital (knowledge and skills), social capital (inter-community relationships), financial capital (employment) and natural capital (water availability and soil stability) (Table 2).

Table 3. Expected community impacts (CM2.1)

Community Group	Impact(s)	Type of Benefit/Cost/Risk
Community	Improved livelihoods through direct employment	Positive, Actual, Direct
	An increase in the number of individuals with improved capacity due to diversified	Positive, Actual, Direct

	educational and employment opportunities from training	
	Maintenance of climate	Positive, Predicted, Indirect
	Ecosystem benefits	Positive, Predicted, Indirect
	Improved soil quality	Positive, Predicted, Indirect
	Water resources	Positive, Predicted, Indirect
Women and Youth	Women will have equal opportunities to participate in the project activities across all levels.	Positive, Actual, Direct
	Substantially reduce the proportion of unemployed, uneducated, and untrained youth	Positive, Actual, Direct
Neighbouring farms/lodges	Ecological benefits	Positive, Predicted, Indirect

Biodiversity

The project area falls within the Maputaland-Pondoland-Albany centers of diversity and endemism, representing exceptional faunal and floral biodiversity. The vegetation of the project area is predominantly succulent thicket, 6,800 ha of the total 16,000 ha reserve mapped as intact or degraded *P. afra*-dominated thicket. Other biomes in the area include fynbos and grassland along the northern extent of the Zuurberg mountains, areas where *P. afra* will not be planted. As degraded thicket shifts into an alternative stable state consisting of many karroid elements, evidence-based decisions on planting sites need to be made to avoid planting *P. afra* in areas where it would not historically occur. Acting primarily as an area for conservation and ecotourism, KLPGR hosts numerous red-listed faunal species which rely on thicket habitats, such as African

Elephants. Baselines for plant diversity (tree/shrub and grass/forb) will be measured and monitored over the project lifetime and complemented by population trends of red-listed plant and animal species. The expected biodiversity benefits from the project activities are described in the table below (Table 3).

Table 4. Expected biodiversity changes

Biodiversity Element	Estimated Change	Justification of change
Soil Quality	Improved soil quality	The planting of <i>P. afra</i> improves soil quality through the addition of leaf litter and the improved soil quality and SOC will result in improved infiltration rates and water retention capacity of the soils.
Nutrient Cycling	Improved nutrient cycling within the ecosystem	Degraded thicket vegetation in the project area will be restored, which will result in the return of ecosystem carbon. Restoring thicket by planting cuttings of <i>P. afra</i> results in the removal of carbon dioxide from the atmosphere and the return of ecosystem carbon (in above-ground biomass, below-ground biomass, dead wood, litter, and SOC), thereby providing removal enhancements.
Native flora and fauna	Re-introduction of other native flora and fauna	Shrub and tree diversity will increase because of the planting of <i>P. afra</i> cuttings, as their canopy reduces soil temperatures, improves soil quality through the addition of leaf litter, reduces the incidence of frost at ground

		level and is likely to reduce runoff of rainwater.
Pollination activity	Increased pollination activity from bees/insects	The restoration of degraded thicket will encourage the proliferation of bees and other pollinators in and around the project area. This may improve wild plant reproduction within the project area as well as the reproduction of crops grown in surrounding areas, leading to improved food production, and resulting in an economic boost for farmers in adjacent areas.

Climate and Biodiversity Gold

The project has expected net positive impacts on climate mitigation and biodiversity in the project zone. Project climate and biodiversity benefits both reach the Gold Standard level:

Climate Gold Standard: The net climate impact of the proposed ARR project is positive. The total carbon sequestration potential per unit land area is 613.31 t CO₂e ha⁻¹. The region is projected to experience continuous rising temperatures with a potential increase of 2.0°C by the 2050s and 4.2°C by the 2090s under high emission scenarios. Heat waves and evapotranspiration rates are expected to increase, potentially affecting local economic development and agricultural productivity. The restoration of thicket through *P. afra* cuttings will sequester a substantial amount of carbon and help mitigate the effects of climate change.

According to most models, rainfall in South Africa is projected to decline, with a decrease in average annual rainfall shown under a high-emission scenario. The project area, situated in a low rainfall area with no major rivers, experiences periodic droughts. The project activities will help mitigate the effects of drought by increasing the availability of water in the project area. This is an important environmental and social aspect due to the project area’s semi-arid climate.

Biodiversity Gold Standard: The project area is located in the Maputaland-Pondoland-Albany biodiversity hotspot. The hotspot contains approximately 8,100 species and has a very high percentage of endemism in the region. Overall, of the 8,100 species, the region is thought to

contain 83 critically endangered plant species, 128 that are endangered and 323 that are listed as vulnerable. Some of these Red Listed species include the African Elephant (*Loxodonta africana*), Karoo cycad (*Encephalartos lehmannii*) and the flightless dung beetle (*Circellium bacchus*). These threatened species will benefit from the increased habitat gained through thicket restoration.