NATURAL CAPITAL, SOCIAL IMPACT & SUSTAINABLE DEVELOPMENT

PROGRESS REPORT NO.6
YEAR ENDING 31 DECEMBER 2024

MILTON

KARINGANI
PEOPLE WILDLIFE CONSERVATION

2024

Baobab tree in Karingani

Mozambique

Zimbabwe

Greater Limpopo
Transfrontier
Conservation Area

Limpopo
National
Park

Kruger
National
Park

Mozambique

Karingani

South
Africa

Indian Ocean

Maputo

CONTENTS

VISION

At Karingani, we have an integrated and enduring vision, of becoming a world-leader in sustainable conservation. Our goal is to restore, enhance and maintain the natural ecological processes and biodiversity of Karingani through an effective and sustainable partnership between the Mozambican Government, private investors and participating communities.

PURPOSE

Utilise, exemplify and demonstrate the viability of world-leading investor-funded sustainable conservation practice in order to re-establish and preserve the presence of wilderness and wildlife, alongside thriving and like-minded communities in this vast and strategically important habitat, which, without careful, long term responsible stewardship, faces the stark risk of being lost forever.

EXECUTIVE SUMMARY

The Karingani management team and Milton Group have prepared their sixth annual report for the period of 1 January 2024 to 31 December 2024, for the founders of Karingani: Vaneteze Investment Holdings Ltd, RMW Investments, The Bedari Foundation and local Mozambican shareholders.

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Termed the Natural Capital, Social Impact and Sustainable Development Progress Report No.6, it forms the basis of demonstrating progress for the past report period in restoration, sustainability, and built form development at Karingani.

The report continues to adopt two internationally recognised standards of measuring sustainability and monitoring the restoration progress. The first standard is 'One Planet', a set of principles that measure commitment to sustainability, derived from the United Nations Sustainability and Development Guidelines adopted in 2015, available at www.OnePlanet.com. The second standard is SER (2019), the International Standards for the practice of Ecological Restoration, available at www.SER.org.

Using these two internationally recognised standards as a guide, we developed a series of attributes that we intend to measure using key performance indicators (KPIs) identified as fit-for-purpose for all components of Karingani's restoration and development targets, to monitor, indicate and measure change for the purposes of sustainability and positive impact.

During this reporting period, Karingani continues to also utilise an adopted folio of management control standards that include:

- Karingani Constitution which governs and protects the overall property assets
- Community Constitution governing the interaction between Karingani and neighbouring communities
- Conservation and Development Management Plan (CDMP)
- Phased Utilities Management Masterplan
- Karingani Design and Sustainability Guidelines
- Karingani Master Brand Guidelines
- A series of living documents that guide and governs field operations and activities
- Karingani Operator Partner Guidelines

Members from one of Karingani's neighbouring communities

Buffy pipit at Karingani

The ongoing application of these operational management standards further allows Karingani to track, collate and analyse data against the multiple and defined key performance indicators.

We continue to measure the performance outcomes at Karingani towards the property's planned restoration and ultimate vision in maintaining the current and future biodiversity and providing positive social impact within the neighbouring communities. This process is considered as two distinct phases: Phase 1 Ecological Restoration and Phase 2 Maintenance of Biodiversity and Sustainability.

Ecological Restoration, as a means of conserving biodiversity and improving human well-being, is now widely adopted globally, and complies with One Planet principles. This underpins why and how Karingani applies its best practice management decisions towards the goals of restoration. The expectation is that the restoration phase for Karingani will spa the period of time required to enable the land to become dynamically self-regulating, through intervention and management in the early years of this process. Given the future and unknown impact of climate change, it may mean, however, certain components of the system require management in perpetuity.

By comparing the component elements measured within the Natural and Social Capital wheel versus the Sustainable Development wheel (see pages 5 and 9), Karingani can demonstrate where progress has been made when considering this dashboard of data. Importantly, Karingani can continues to use this dashboard of data to determine where mitigation is required to positively enact change.

When reviewing the dashboard, each wedge has been allocated a primary heading or attribute that reflects the ultimate position of success of the component restoration or development that needs to be reached. Within each primary attribute, three or four secondary attributes are inserted to demonstrate the result and progress of implementation of the various KPIs identified, considered important to achieving the primary attribute. The progressive movement of each secondary attribute is based upon a five-stage scoring system where each stage score level is cumulative and depicts a visual gradient towards the highest score of 5. This system of scoring remains consistent with prior reports.

We continue to review fit for purpose technologies and methods of data capture to align with our strategic plans, organizational charts and departmental verticals, building on the ground capacity.

We remain grateful for the collaboration of strategic partners, information sharing and cross learnings both within Mozambique and beyond.

These proprietary reports are vital for ongoing management decision making at Karingani and help underpin the unique valuation methodologies we apply to this large scale and land asset keeping Karingani relevant with the conservation and sustainable tourism industries.

We would like to thank all the contributing parties for yet another excellent body of work and look forward to sharing next years results and performance outcomes accordingly.

NATURAL & SOCIAL CAPITAL WHEEL

2017-23   2024

PRIMARY ATTRIBUTES	SECONDARY ATTRIBUTES	ONE PLANET	KEY PERFORMANCE INDICATOR (KPI)
MITIGATING THREATS	Climate Change Mitigation		• Surface Water • Fire Management • Large Mammal Management
	Alien Invasive Species		• Alien Plant Species • Alien Animals Species • Disease Control
TERRITORIAL INTEGRITY	Boundary and Fencing		• Boundary Fence • Fence Maintained • Minimise Human Wildlife Conflict
	Security Staff and Counter-Poaching		• Wildlife Security • Incursions Associated with Communities • Poaching Incidents • Field Ranger Force • Patrolling and Deployment • Poacher Contacts & Arrests • Poaching Impact
	Support Services		• Joint Operations with Key Stakeholders • Legal Compliance & Processes • Air Support • Intelligence Gathering and Use • Technology Application
LANDSCAPE INTEGRITY	Past Human Imprint		• Sites of Human Habitation • Agriculture Infrastructure • Weirs, Dams and Dam Walls
	Geomorphology, Hydrology and Soil		• Geomorphological Integrity • Hydrological Integrity • Soil Integrity
	Connectivity Restored		• Landscape Flows • Gene Flows • Habitat Linkages
BIOTIC STRUCTURE & DIVERSITY	Vegetation Structure		• Vegetation Monitoring in Past-Impacted Areas
	Plant Diversity		• Diversity Measurements and Surveys
	Animal Diversity		• Incidental Animal Sightings • Large Mammal Survey • Vulture and Stork Survey • Large Mammal Re-Establishment
ECOSYSTEM FUNCTION	Productivity and Cycling		• Herbaceous Productivity
	Habitat Interactions		• Trophic Interactions • Landscape Strategies
	Resilience and Recruitment		• Response to Disturbance
BUILT ENVIRONMENT & SUSTAINABILITY	Energy and Carbon		• Reduced Carbon Footprint
	Water		• Reduced Water Consumption
	Waste		• Waste Reduction
	Materials and Resource Consumption		• Responsibly & Locally Sourced
SOCIAL CAPITAL	Social Empowerment		• Community Infrastructure Constructed • Child Survival Rate & Adult Survival Rate • School Enrollment • Employment & Quality Learning • Community Water Provision • Community Healthcare Support • Farming and Livestock Support
	Stakeholder Engagement		• Community Ambassadors • Community Relations and Activities • Community Constitution • Addressing Human Wildlife Conflict • Fundraise Initiatives • Urbanisation Impact and Planning
	Economic Development		• Support Local Entrepreneurs • Public-Private Partnerships • Encourage Sustainable Resources • Community Land Use Planning • Community Agriculture • Number of New Registered SME Businesses • Employment for Women • Downstream Positive Impact

	1	2	3	4	5
MITIGATING THREATS	• Required management and mitigation strategies identified and under development – at least 1 strategy in initial implementation phase • Threats of invasive species identified; Further deterioration halted; strategy for mitigation in development	• Two strategies documented and developed – at least 1 strategy fully implemented • Two strategies documented and developed – at least 1 strategy fully implemented	• Three strategies documented and at least 2 strategies fully implemented • Three strategies documented and at least 2 strategies fully implemented	• All three strategies fully implemented and monitored • All three strategies fully implemented and monitored	• All three strategies fully implemented and achieving relevant goals – adaptively manage change • All three strategies fully implemented and achieving relevant goals – adaptively manage change
TERRITORIAL INTEGRITY	• At least 20 % of the protected area delineated and fenced to required standards and maintained to a point of the proportionate achievement to the identified goal • Trained security staff count below the GLC required density of 1 per 35 km2; supported and equipped towards 20% of the identified security strategy needs • Support services at 20% of the identified attributes required towards security strategy	• At least 40 % of the protected area delineated and fenced to required standards; maintained to a point of the proportionate achievement to the identified goal • Trained security staff count below the GLC required density of 1 per 35 km2; supported and equipped towards 40% of the identified security strategy needs • Support services at 40% of the identified attributes required towards security strategy	• At least 60 % of the protected area delineated and fenced to required standards; maintained to a point of the proportionate achievement to the identified goal • Trained security staff count at 30-40% of IUCN recommended standard; supported and equipped towards 60% of the identified security strategy needs • Support services at 60% of the identified attributes required towards security strategy	• At least 80 % of the protected area delineated and fenced to required standards; maintained to a point of the proportionate achievement to the identified goal • Trained security staff count at 40-50% of IUCN recommended standard; supported and equipped towards 80% of the identified security strategy needs • Support services at 80% of the identified attributes required towards security strategy	• 100 % of the protected area delineated and fenced to required standards and maintained towards continually achieving the identified goals • Trained security staff at the IUCN recommended standards for 'threatened areas'; supported and equipped towards 100% of the identified security strategy needs; adaptation of strategy and resourced accordingly • Support services at 100% of the identified attributes required towards security strategy
LANDSCAPE INTEGRITY	• Past human impacts and signs identified and documented; mitigation requirements identified • Identify relevant strategies towards achieving goal, prevent further deterioration caused by man induced disturbances • Literature research and document current understanding of the spatial dynamics of the Karingani ecosystem	• Mitigation initiated in at least one of the identified secondary attributes towards goal achievement • At least one strategy developed, fully implemented and monitored • Develop and implement at least 1 strategy towards goal achievement	• Mitigation in process for at least two of the identified secondary attributes towards goal achievement • At least two strategies developed, fully implemented and monitored • At least 2 strategies developed and fully implemented	• At least 1 one of the identified attributes fully mitigated and 2 in significant stages of mitigation towards completion • At least three strategies developed, fully implemented and monitored • All three strategies fully implemented	• All signs of past human imprint identified and mitigated to the point that the natural rehabilitation process can proceed • All required mitigation inputs complete, restoration at a point where natural recovery processes can proceed unaided • All required mitigation inputs complete, restoration at a point where natural recovery processes can proceed unaided
BIOTIC STRUCTURE & DIVERSITY	• Initiate the documentation and mapping of the existing vegetation structure and diversity of the reserve • Document and understand where and how alpha and gamma diversity have been impacted by past land use (site and reserve wide) • Based on initial reserve wide inventories, document reserve wide species losses and set appropriate benchmark as restoration targets	• Identify, map and document impacted areas; refine documentation of the current vegetation communities within the reserve • Plan site and species specific restoration measures • Develop group specific (bird, small mammal and large mammal) restoration plans	• Monitor passive recovery in impacted areas and identify where active intervention is required • Implement site and species specific restoration measures and monitor outcomes – Phase 1 • Implement large mammal restoration plan and monitor trend towards restoration target. Monitor passive recovery of small mammals and birds, and identify required interventions	• Plan and implement active recovery in impacted areas • Implement site and species specific restoration measures and monitor outcomes – Phase 2 • Implement large mammal restoration plan and monitor trend towards restoration target. Monitor passive recovery of small mammals and birds, and implement required interventions	• All required mitigation inputs complete, restoration at a point where natural recovery processes can proceed unaided • All required mitigation inputs complete, restoration at a point where natural recovery processes can proceed unaided • All required mitigation inputs complete, restoration at a point where natural recovery processes can proceed unaided
ECOSYSTEM FUNCTION	• Physical processes are at a foundational stage only, capable of future development of functions similar to the reference • Trophic interactions are at a foundational stage only, capable of future development of functions similar to the reference • Ecological resilience is at a foundational stage only, capable of future development similar to the reference	• Physical processes show increased potential for a wider range of functions including nutrient cycling, and provision of habitats/resources for other species • Trophic interactions show increased potential for a wider range of functions including nutrient cycling, and provision of habitats/resources for other species • Ecological resilience shows increased potential for a wider range of functions including nutrient cycling, and provision of habitats/resources for other species	• Evidence of physical functions commencing – e.g., nutrient cycling, water filtration and provision of habitat resources for a range of species • Evidence of trophic interactions of damaged areas commencing – e.g., nutrient cycling, water filtration and provision of habitat resources for a range of species • Evidence of short term recovery commencing – e.g., water infiltration, re-vegetation (annuals) and provision of habitat resources for a range of species	• Substantial evidence of key physical functions and processes commencing including reproduction, dispersal and recruitment of species • Substantial evidence of key trophic interactions and processes commencing including herbivory, reproduction, dispersal, recruitment of species and predation • Substantial evidence of key perennial species are recruited and biophysical processes commencing including nutrient cycling, trophic interactions, reproduction, dispersal and recruitment of species	• Considerable evidence of functions and processes on a secure trajectory towards reference system • Considerable evidence that trophic interactions and processes are on a secure trajectory towards reference system • "Considerable evidence of functions and processes on a secure trajectory towards reference and evidence of ecosystem resilience likely after reinstatement of appropriate disturbance regimes."
BUILT ENVIRONMENT & SUSTAINABILITY	• Assess existing performance of Karingani's energy usage and carbon footprint • Assess existing waste, management of landfill and reduction strategies • Assess current sourcing strategies, use of firewood, and extraction rehabilitation • Assess water harvest, water system, sourcing and quality	• Developed comprehensive plans for domestic and construction waste segregation, tracking, and minimization • Sustainable Procurement Management Plan: Created a procurement framework • Drafted a water strategy focusing on water balance models, rainwater harvesting, and future greywater recycling, supporting integrated water systems • Formulated an energy strategy culminating in the design of an integrated renewable power	• Implemented operational and construction waste plans achieving 81% diversion from landfill with daily and weekly monitoring. • Procurement plan adopted in testing phase for all new Mbilu infrastructure • Water strategy adopted through rainwater harvesting, water balance modelling, and system integration; greywater recycling • Integrated solar PV and battery system planned at Mbilu	• Daily monitoring of domestic waste and weekly tracking of construction waste at Mbilu • Local and certified material use recorded where feasible; gaps identified for improvement • Water consumption tracked to establish baseline per capita usage across operational areas • Energy consumption and carbon emissions monitored using IPCC-aligned factors	• Full reporting on waste volumes and diversion rates; expansion to reserve-wide tracking • Annual reporting will quantify local spend and sustainable sourcing rates • Water use and efficiency reported annually, with future inclusion of greywater recycling data • Annual reporting includes renewable energy share, emissions reductions, and system expansion progress
SOCIAL CAPITAL	• Necessary Infrastructure identified and minimum needs constructed per associated community; Employment protocol established to prioritise neighbouring communities • Engagement programme initiated with Cubo community; channels of communication open and mutual • Focused support on local vendors for internal needs; identify and plan commercial partnership enterprises suitable for the region	• Operational support of built infrastructure: programme initiated – Mapulanguene and Cubo • Engagement programme extended towards Mapulanguene and Khumani community; channels of communication open and mutual • Initiate at least one of the identified commercial projects; planning and preparation for the next project	• Operational support of built infrastructure: programme initiated – Massingir; Deca da Vitoria • Engagement programme extended towards Massingir and Deca da Vitoria; channels of communication open and mutual • At least first project operational; Implementation of at least the next development project	• Operational Support of built infrastructure: programme initiated – Ringani; Mbakani • Engagement programme extended towards Ringani and Mbakani; channels of communication open and mutual • Multiple operational projects; implementation of next identified project	• Operational support of built infrastructure: all social development infrastructure operational and equipped; maintenance and support phase • Engagement programme extended to Nyandlopfu and Matsandzana; all associated neighbouring communities channels of communication open and mutual • All identified projects operational

SUSTAINABLE DEVELOPMENT WHEEL

● 2017-23 ● 2024
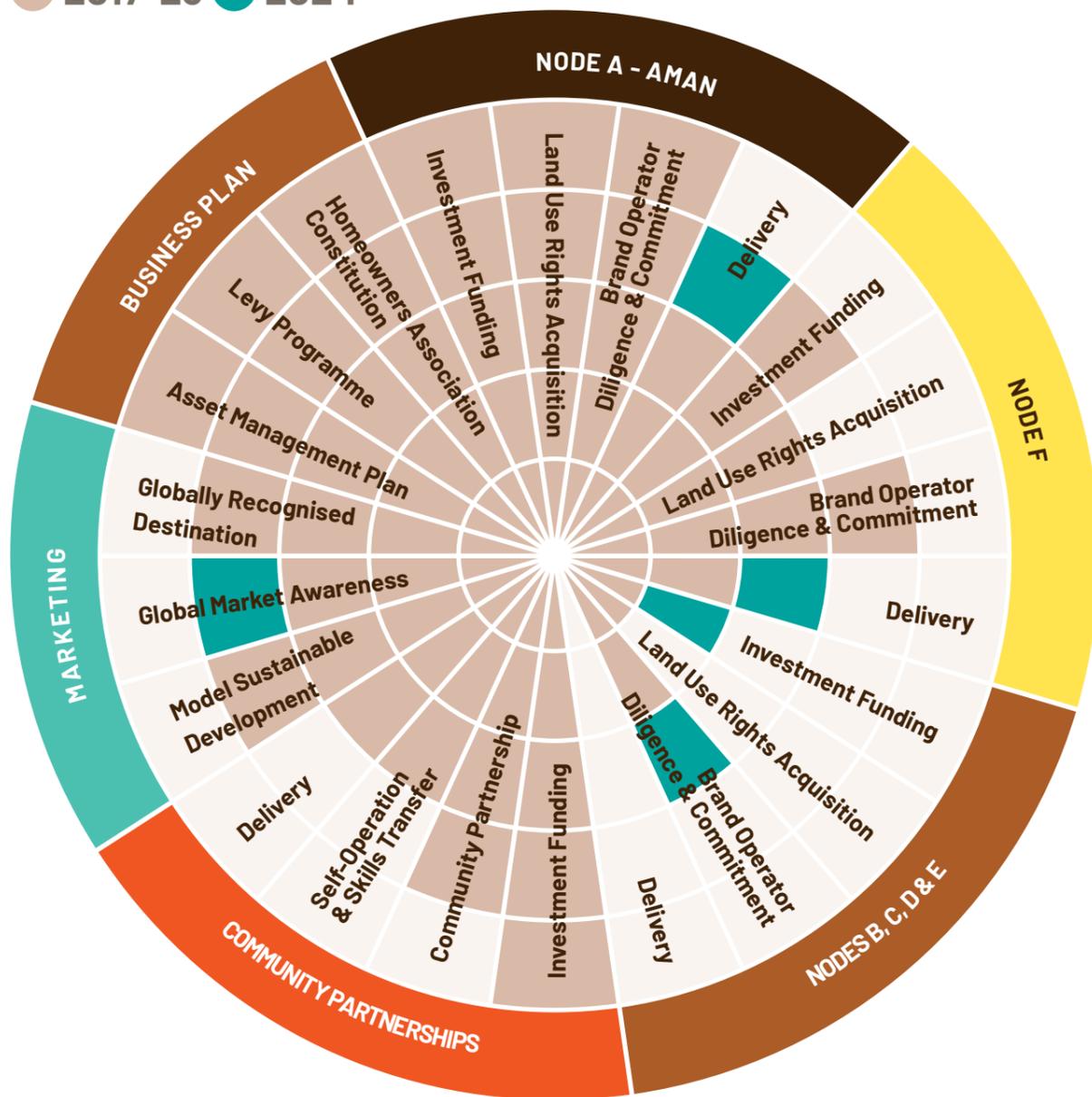
PRIMARY ATTRIBUTES	SECONDARY ATTRIBUTES	ONE PLANET	KEY PERFORMANCE INDICATOR (KPI)
NODE A - AMAN	Investment Funding		• Go to Market
	Land Use Rights Acquisition		• Step Plan for Deannexure
	Brand Operator Diligence and Commitment		• Management Contract
	Delivery		• Compliance with Design and Sustainability Guidelines and Implementation of Sustainable Construction Plan
NODE B	Investment Funding		• Go to Market
	Land Use Rights Acquisition		• Step Plan for Deannexure
	Brand Operator Diligence and Commitment		• Management Contract
	Delivery		• Compliance with Design and Sustainability Guidelines and Implementation of Sustainable Construction Plan
NODES C, D, E & F	Investment Funding		• Go to Market
	Land Use Rights Acquisition		• Step Plan for Deannexure
	Brand Operator Diligence and Commitment		• Management Contract
	Delivery		• Compliance with Design and Sustainability Guidelines and Implementation of Sustainable Construction Plan
COMMUNITY PARTNERSHIPS	Investment Funding		• Secure Funding from Project Founders
	For-Profit and Public-Private Partnerships		• Joint Venture Agreement
	Self-Operation and Skills Transfer		• Management Team & Training Programmes
	Delivery		• Compliance with Design and Sustainability Guidelines and Implementation of Sustainable Construction Plan
MARKETING	Globally Recognised Destination		• Attract Best in Class Operators • Attract High Net-worth Guest Market & People of Influence • Increased National Capital Valuation
	Global Market Awareness		• Digital & Social Media Platform Following • Publications & Editorials
	Model Sustainable Development		• Awards & Recognition for National & Social Capital Planning & Operations
BUSINESS PLAN	Asset Management Plan		• Business Plan, Feasibility Plan, Management Team
	Levy Programme		• Economic Offset & Cost of Operations, Contribution to Conservation Management
	Homeowners Association Constitution		• Long-Term Stewardship, Value Preservation of Asset, Data Capture and KPIs for Informed Decision-Making

SUSTAINABLE DEVELOPMENT ATTRIBUTE SCORING

	1	2	3	4	5
NODE A – AMAN	• Initial market discussions • Legal team briefing • Site visit and selection • Appoint professional team	• Investor interest • Site boundary definition • Letter of intent • Design complete	• Complete diligence • Interaction with relevant authorities • Development programme • Project pricing	• Investment documents • Formalisation of proposal • Pro forma and feasibility signing • Pre-construction	• Closing • DUAT issued • Closing • Sustainable construction
NODE B	• Initial market discussions • Legal team briefing • Site visit and selection • Appoint professional team	• Investor interest • Site boundary definition • Letter of intent • Design complete	• Complete diligence • Interaction with relevant authorities • Development programme • Project pricing	• Investment documents • Formalisation of proposal • Pro forma and feasibility signing • Pre-construction	• Closing • DUAT issued • Closing • Sustainable construction
NODES C, D, E & F	• Initial market discussions • Legal team briefing • Site visit and selection • Appoint professional team	• Investor interest • Site boundary definition • Letter of intent • Design complete	• Complete diligence • Interaction with relevant authorities • Development programme • Project pricing	• Investment documents • Formalisation of proposal • Pro forma and feasibility signing • Pre-construction	• Closing • DUAT issued • Closing • Sustainable construction
COMMUNITY PARTNERSHIPS	• Engage with community • Set draft terms of partnership • Site selection • Appoint professional team	• Secure commitment to funding • Site boundary definition • Finalise partnership agreement • Conceptual design complete	• Interaction with relevant authorities • Development programme • Project pricing	• Construction contracts • Pro forma and feasibility signing • Pre-construction and site enabling • Procurement	• Sustainable construction • Identify management team • Pre-opening preparation • Opening and management
MARKETING	• Attract world class hospitality brands • Brand development and positioning statement • Develop framework	• Co-formulation of development strategy • Photography and videography • Adoption of principles	• Design input • Marketing collateral • Input from third party experts	• Co-development of marketing strategy • Sales materials • Final model & plan sign off	• Sales and launch • Social and PR • Application
BUSINESS PLAN	• Financial feasibility • HOA constitution draft • Conceptualise • Quantify baseline	• Variance reporting • Benchmarked • Mitigation plan	• Operational measurement and review • Adoption • Development plan	• Risk management and review • Implementation • Update KPIs	• Regular report (natural and social capital) • Operational • Valuation complete

2024 NOTABLE ACHIEVEMENTS

Karingani predator donation and translocation of 2 leopards and 4 spotted hyenas to Gorongosa National Park

Commissioning of bulk water and power to Aman development node

23 students graduated from the South African College for Tourism – 15 in tourism and 8 qualified trackers

Aman: Conceptual design / Appointment of general contractor / Project program for hotel delivery agreed Nov 2027 opening date

Successful wildlife augmentation of 1,618 individual animals across five species

Development of departmental strategic plans and the appointment of cornerstone staff members: Executive Director, Operations Director and Community Manager

Community and household survey conducted with 210 households in 11 communities bordering on Karingani

STATED TARGETS FOR 2025

Implement phase 2 of the dam rehabilitation program in line with the reserves water augmentation and restoration strategy

Continue with Wildlife Augmentation bringing in around 400 each of Zebra and Wildebeest

Conclude permissions for the relocation of up to 300 Elephants to Zinave National Park in partnership with Peace Parks Foundation and ANAC

Conclusion of Massingir dam fisheries survey and management plan – commence stakeholder discussions

Deed transfer of development Node A to hotel investor and developer

Sign co-management agreement for Massingir Airport in a PPP with ANAC

Develop a fully integrated regional waste management plan across Karingani, the Development Nodes, and communities to achieve zero waste to landfill in the medium term, building on the 2024 diversion success and expanding circular economy partnerships

Mbecana Pan at Karingani

To assist the reader, throughout this report, we use this map icon of Karingani which represents the three regions of the property: northern, central and southern. This icon is used to orientate the reader towards an area of the property, an event or an area of research that has taken place.

This report continues to include the "Karingani Brand Compliance Icon", which indicates to the reader where our field based operations are in full compliance with internal strategy documents and programmes towards our larger goals of restoration and responsible collaboration.

Karingani enters 2024 with strong momentum, advancing confidently in its mission of conservation leadership and sustainable development. The reserve is now entering an exciting phase with the first commercial hospitality development underway in Node A and ongoing upgrades to internal infrastructure and support systems.

Our commitment remains clear: to set the gold standard in conservation-led reporting, data collection, and impact analysis. In line with this vision, we continue to transition from traditional, static reporting toward dynamic, real-time digital reporting — enhancing transparency, accountability, and adaptive decision-making.

Karingani continues to take pride in its role as a thought leader in conservation, applying science and technology to deliver meaningful results. Our updated Business Plan, revised organizational structure, integrated financial systems, and departmental strategic plans provide a strong foundation for ecological rehabilitation and future tourism investment.

Our long-term vision includes thinking at scale: addressing the implications of population growth, land-use change, and human-wildlife coexistence with foresight and innovation.

As we continue to broaden our regional influence through aligned partnerships and community-centered initiatives, we aim to create lasting positive impact beyond our boundaries. Our work is increasingly shaped by the global context — from biodiversity loss to climate change — and we remain dedicated to carbon reduction and evidence-based ecological stewardship.

We extend our sincere appreciation to our key operational and research partners — Impact Observatory, Harvard University, TUSK Trust, OnePlanet and Ellery Worth — for their invaluable technical input, guidance, and collaborative support throughout this reporting period.

Lastly, and on behalf of the Founding Partners, we thank the entire Karingani team for their outstanding contributions. Your dedication, both on the ground and behind the scenes, continues to drive our shared mission forward.

Paul Milton
CEO

Mateus Mutemba
Executive Director

ONE PLANET PRINCIPLES

The One Planet framework consists of ten simple principles that make it easy to plan, deliver and communicate sustainability progress.

Within this report the ten One Planet principles are represented by the colored icons below and are cross-referenced with the stated KPIs.

	HEALTH AND HAPPINESS	Encouraging active, social, meaningful lives to promote good health and wellbeing
	EQUITY AND LOCAL ECONOMY	Creating safe, equitable places to live and work which support local prosperity and international fair trade
	CULTURE AND COMMUNITY	Nurturing local identity and heritage, empowering communities and promoting a culture of sustainable living
	LAND AND NATURE	Protecting and restoring land for the benefit of people and wildlife
	SUSTAINABLE WATER	Using water efficiently, protecting local water resources and reducing flooding and drought
	LOCAL AND SUSTAINABLE FOOD	Promoting sustainable humane farming and healthy diets high in local, seasonal organic food and vegetable protein
	TRAVEL AND TRANSPORT	Reducing the need to travel, encouraging walking, cycling and low carbon transport
	MATERIALS AND PRODUCTS	Using materials from sustainable sources and promoting products which help people reduce consumption
	ZERO WASTE	Reducing consumption, reusing and recycling to achieve zero waste and zero pollution
	ZERO CARBON ENERGY	Making buildings and manufacturing energy efficient and supplying all energy with renewables
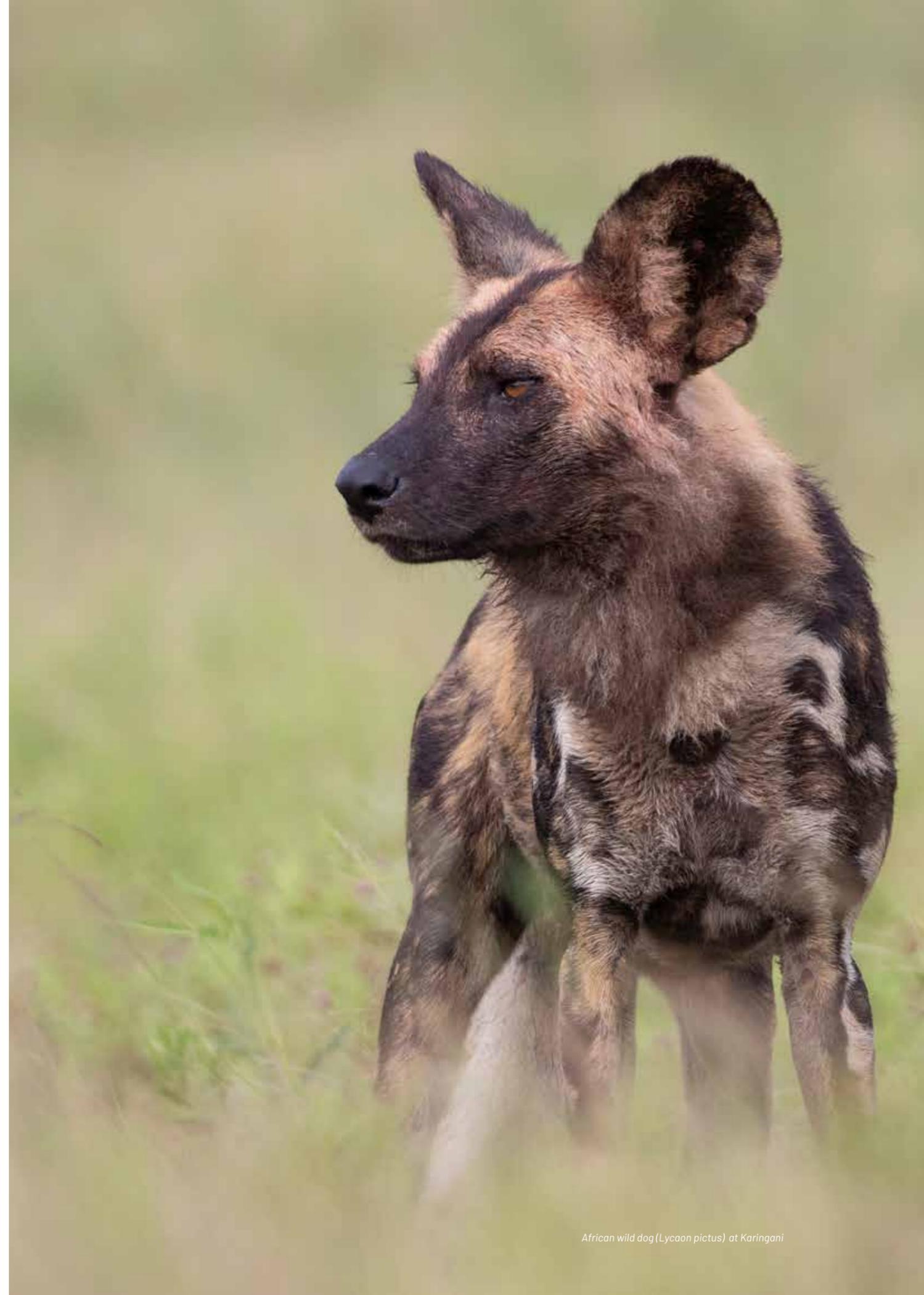
African wild dog (Lycaon pictus) at Karingani

RESERVE MANAGEMENT STRATEGIES AND PLANS

Subsequent to Report No.5, published 31st March 2023, the Karingani Founding Partners continue to undertake extensive research into establishing categories of measurement that extend Karingani's influence on making a difference to the flora, fauna and neighbouring communities. The following chapters measure Karingani's performance against the 10 guiding principles of One Planet.

Fish eagle and a Pel's fishing owl at Karingani

WASTE AND SUSTAINABILITY

In 2024, Karingani advanced its waste management strategy, achieving an 81% diversion rate from landfill at Mbilu through a combination of recycling, composting, and food waste repurposing. The team began exploring strategic partnerships with AMOR and KOLEKT, laying the groundwork for transparent waste tracking and the integration of circular economy principles. Community engagement remains central to this approach. Karingani's long-term goal is to achieve 100% landfill diversion by 2026, with reserve-wide system expansion and enhanced digital monitoring planned for implementation in 2025.

PROCUREMENT

In 2024, Karingani piloted a responsible procurement plan that prioritises local, sustainably sourced, certified, and low-emission materials for all new infrastructure development at Mbilu. Once fully implemented and tracked, this approach is expected to reduce transport-related emissions, support regional suppliers, and establish a new benchmark for sustainable construction. Full digital tracking and reporting are scheduled for rollout in 2025 to enhance transparency and measure impact more effectively.

STRATEGIC IMPLEMENTATION DOCUMENTS

To support the expansion of infrastructure and design development in line with Karingani's sustainability goals, a suite of strategic implementation documents was developed and adopted during 2024. These documents provide clear guidelines for both contractors and design professionals operating within the reserve.

Contractor Implementation Documents

A series of control documents were finalised to ensure contractors align with Karingani's sustainability, equity, and environmental standards:

- KGR – SCAPP Introduction and Guidelines Document
- KGR – Equitable Employment and SME Development Plan – Guidelines for Contractors
- KGR – Responsible Procurement Management Plan – Node A
- KGR – Construction Waste Management Plan
- KGR – Erosion Control and Sedimentation Plan (Construction Activity Pollution Prevention)
- KGR – Sustainable Construction Management Guidelines
- KGR – Working in Karingani – Contractor Orientation Manual

These documents set the framework for responsible construction activity and inclusive employment practices across all development nodes.

Design Professional Guidance

In parallel, strategic documentation was introduced to guide all design professionals working within the reserve:

- KGR – Sustainable and Responsible Procurement Management Plan, Design
- KGR – Design and Sustainability Requirements for All Design Professionals

This design requirements document draws on the Karingani Reserve: Design and Sustainability Guidelines for the Built Environment, Landscape and Infrastructure, the Procurement Management Plan, and a suite of relevant ASHRAE standards. All professionals engaged in built environment work are required to formally respond to and comply with these standards.

NATURAL CAPITAL RESULTS

A white rhino (Ceratotherium simum) bull at Karingani

MITIGATING THREATS

CLIMATE CHANGE MITIGATION

KPI 1 | Surface Water
AIM To monitor and build long-term records of available surface water within Karingani, to assist in responsible ecological management.

KPI 2 | Fire Management
AIM To manage fire return period to promote species and habitat diversity at the regional level, protect fire sensitive habitats, improve habitat quality for resident and temporary resident herbivores, manage the fire risk to humans and infrastructure at an acceptable level and contribute to carbon sequestration.

KPI 3 | Large Mammal Management
AIM To manage the restoration of large mammal communities to avoid an overshoot of rangeland production.

ALIEN INVASIVE SPECIES

KPI 1 | Alien Plant Species
AIM To eradicate or manage alien invasive plants to levels that do not detrimentally alter ecosystem function or impact on the viability of indigenous species.

KPI 2 | Alien Animal Species
AIM To eradicate or manage alien animals to levels that do not detrimentally alter ecosystem function or impact on the viability of indigenous species.

KPI 3 | Disease Control
AIM To eradicate or manage alien plant and animal diseases to levels that do not detrimentally alter ecosystem function or impact on the viability of indigenous species.

TERRITORIAL INTEGRITY

BOUNDARY AND FENCING

KPI 1 | Boundary Fence
AIM To have a government approved delineation for the entire reserve boundary and the appropriate fence erected.

KPI 2 | Fence Maintained
AIM To maintain the fence to a level that promotes its effectiveness as an animal barrier.

KPI 3 | Minimise Human Wildlife Conflict
AIM To manage human wildlife conflict along the boundaries of the reserve to levels that effectively balances the needs of the people and the aims of biodiversity conservation.

SECURITY STAFF AND COUNTER-POACHING

KPI 1 | Wildlife Security
AIM To ensure no significant negative impact on the population growth of the biotic component of Karingani. Securing the game reserve from trespass and all illegal activities of man that impact on wildlife and environment Illegal pressures.

KPI 2 | Incursions Associated With Neighbouring Communities
AIM To understand what communities are either supportive or unsupportive of poaching; where the largest threat of poaching lies to the east; and how effective our counter-poaching efforts are per community.

KPI 3 | Poaching Incidents
AIM To understand the extent, trend and distribution of poaching incidents within Karingani.

KPI 4 | Field Ranger Force
AIM To train, deploy and manage an effective field ranger force.

KPI 5 | Patrolling and Deployment
AIM To efficiently deploy the available field ranger force to deter incursions, maintain perimeter integrity, force contact with and apprehend perpetrators.

KPI 6 | Poacher Contacts & Arrests
AIM To maximise poacher contact, arrest and confiscation of illegal firearms.

KPI 7 | Poaching Impact
AIM To measure and ultimately minimise the impact of poaching on the biota of Karingani.

SUPPORT SERVICES

KPI 1 | Joint Operations with Key Stakeholders
AIM To form collaborative partnerships with government and non-government conservation organisations to strengthen regional response to poaching pressure.

KPI 2 | Legal Compliance and Processes
AIM To ensure the appropriate sentences for wildlife related crime are affected.

KPI 3 | Air Support
AIM To deploy a safe and appropriate level of aerial support for security, biological and administrative needs.

KPI 4 | Intelligence Gathering and Use
AIM To establish and manage an effective informer network.

KPI 5 | Technology Application
AIM To deploy and utilise appropriate technological aids for the detection, pursuit and arrest of wildlife criminals.

LANDSCAPE INTEGRITY

PAST HUMAN IMPRINT

KPI 1 | Sites of Human Habitation
AIM To identify and rehabilitate all sites of past human habitation.

KPI 2 | Agriculture Infrastructure
AIM To identify, remove and rehabilitate old agricultural infrastructure (dips, wells, fence lines, pipelines irrigation furrows etc.).

KPI 3 | Weirs, Dams and Dam Walls
AIM To remove and restore all unwanted hydrological infrastructure which interferes with natural hydrological and geomorphological processes.

GEOMORPHOLOGY, HYDROLOGY AND SOIL

KPI 1 | Geomorphological Integrity
AIM To identify, modify or remove and restore man-made structures which impede natural geomorphic processes.

KPI 2 | Hydrological Integrity
AIM To identify, remove and restore all impediments to normal hydrological flows in the reserve, and to implement a surface water augmentation strategy that is ecologically acceptable and does not compromise the geomorphological and hydrological integrity of the reserve.

KPI 3 | Soil Integrity
AIM To identify, restore and maintain human caused erosion that impacts on geomorphological and hydrological integrity and ecosystem function.

CONNECTIVITY RESTORED

KPI 1 | Landscape Flows
AIM Removing or mitigating the effects of artificial barriers to the movement of organisms across the broader landscape.

KPI 2 | Gene Flows
AIM To restore natural gene flow between isolated populations of organisms in the broader landscape and where this cannot be achieved to a satisfactory extent, enhance this through appropriate meta-population management.

KPI 3 | Habitat Linkages
AIM To restore and maintain linkages between essential source sink habitats where these are essential for the resilience and long-term viability of any population.

BIOTIC STRUCTURE AND DIVERSITY

VEGETATION STRUCTURE

KPI 1 | Vegetation Monitoring in Past-Impacted Areas

AIM To measure, restore (in impacted areas) and maintain vegetation structure and structural diversity typical of each vegetation community within the reserve

PLANT DIVERSITY

KPI 1 | Diversity Measurements and Surveys

AIM To identify, modify or remove and restore man-made structures which impede natural geomorphic processes.

ANIMAL DIVERSITY

KPI 1 | Incidental Animal Sightings

AIM To develop a record based on casual and incidental animal sightings that can over time offer insight towards density, probability and distribution of the animal species on Karingani.

KPI 2 | Large Mammal Survey

AIM To effectively monitor the trends in large mammal populations on Karingani

KPI 3 | Vulture and Stork Survey

AIM To develop an understanding and record of the Vulture and Stork breeding status on Karingani.

KPI 4 | Large Mammal Re-Establishment

AIM To design and maintain appropriate strategies for the re-introduction and re-enforcement of large mammal species

ECOSYSTEM FUNCTION

PRODUCTIVITY AND CYCLING

KPI 1 | Herbaceous Productivity

AIM To restore herbaceous cover and productivity to sites impacted by past human perturbation.

HABITAT INTERACTIONS

KPI 1 | Trophic Interactions

AIM To restore and maintain characteristic trophic interactions within the reserve where they have been impacted by past human interventions.

RESEARCH AND COLLABORATIONS

AIM To conduct and ensure on-going scientific research to determine and understand the key processes that underpin the ecosystem and identify the threats to these processes.

BUILT ENVIRONMENT AND SUSTAINABILITY

ENERGY AND CARBON

KPI 1 | Reduced Carbon Footprint

AIM To minimise and support efficient use of energy demands and establish baselines of current energy consumption and carbon emissions for their consideration and potential reduction in the future.

WATER

KPI 1 | Reduced Water Consumption

AIM To minimise and support efficient use of water, and collect data towards establishing baselines of current water consumption for their consideration and potential reduction in the future.

WASTE

KPI 1 | Waste Reduction

AIM To develop and implement solid waste management practices that result in the least damage to the environment as a whole and at a cost acceptable to society in both the long and short term.

MINERAL & RESOURCE CONSUMPTION

KPI 1 | Sustainable Materials and Construction Practices

AIM To minimise environmental impact by applying low-impact, ecologically sensitive construction practices.

KPI 2 | Responsible Procurement

AIM To reduce emissions and support local economies through the use of sustainably certified and locally sourced materials.

MITIGATING THREATS

GOAL

To identify and mitigate against holistic and specific threats to the ecological systems within Karingani and its greater landscape: considering stochastic environmental events, natural tendencies and anthropogenic impacts. To design and implement appropriate strategies and programmes that mitigate and monitor identified threats, with the purpose of preventing detrimental and irreversible impact to the ecosystem functions and species viability and promote ecological resilience across the Karingani landscape.

Karingani Ranger stands at the ready

CLIMATE CHANGE MITIGATION
RESULTS

A strong governing principle in the ecological restoration and management of Karingani is the knowledge that the global climate and condition are continuously shifting with the increase in the human population and industry. These collective impacts to extreme climate stressor events pose significant risk to global natural landscapes which need to be managed with the mindset of natural resilience to extreme events such as drought, flooding and heat shock. In the Karingani ecosystem, three predominant strategies promote this natural resilience and form the basis for long-term monitoring and data collection towards adaptive and scientific ecological management.

KPI 1 | SURFACE WATER

Karingani continues to demonstrate ecological foresight in managing surface water resources. Guided by our Strategic Plan for Surface Water Augmentation, only two natural pans were selectively supplemented during the dry season — a clear commitment to simulating natural water availability and encouraging sustainable wildlife distribution. Aerial surveys in both the green and dry seasons further enhanced our understanding of water dynamics across the reserve.

Despite a drier year, Karingani successfully maintained surface water availability, underscoring the effectiveness of our strategy and our dedication to balancing conservation needs with ecosystem health.

Natural pan augmented in Karingani

2024 Total Average: 289.2 mm
Wet Season Total: 215.9 mm

2024 Total Average: 301.2 mm
Wet Season Total: 234.2 mm

2024 Total Average 331.0 mm
Wet Season Total: 271.2 mm

Wet Season data from November 2023 - April 2024

Note: Rainfall totals were not reported for 26% of rainfall events

KPI 2 | FIRE MANAGEMENT

Karingani remains steadfast in its commitment to responsible fire management as a key ecological tool. In 2024, while management burns were limited due to climatic conditions, vital areas were still strategically treated, contributing to habitat restoration goals. Although unplanned fires originating outside the reserve presented challenges, our mapping and analysis provide critical insights that are actively informing future prevention and response strategies. The team's rapid assessment and growing dataset ensure we continue to adapt and respond with resilience.
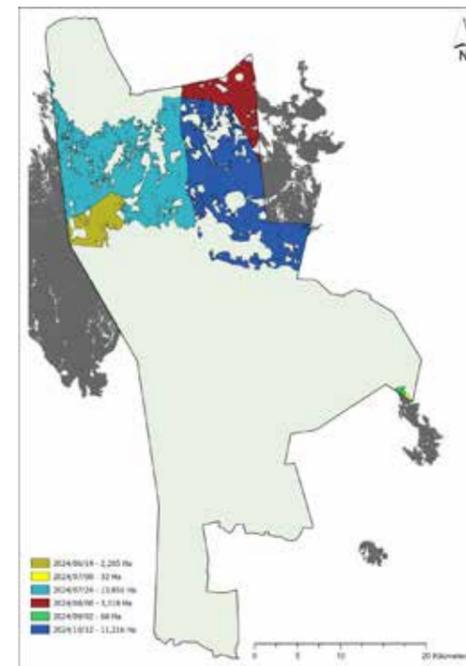
Implementing management burns in Karingani

Fires mapped in Karingani over past 4 reporting periods							
	Apr 2018 – Mar 2019	**Apr 2019 – Mar 2020**	**Apr 2020 – Mar 2021**	**Apr-Dec 2021**	**Jan-Dec 2022**	**Jan-Dec 2023**	**Jan-Dec 2024**
Management Burns (ha)	3,975	8,726	15,296	56,362.6	5,066.8	15,935	2,278
Hectares Difference		+ 4,751		+ 6,570	– 42,569.8	+ 10,868.2	–13,662
Unplanned Lightning (Ha)	0	0	0	0	2,296.3	0	0
Hectares Difference					+ 2,296.3	– 2,296.3	
Accidental/unplanned (Ha)	0	0		9,714.5	47.3	0	28,417
Hectares Difference				+ 9,714.5	– 9,667.2	– 47.1	+28,417

Blue wildebeest (Connochaetes taurinus) being offloaded in central Karingani as part of Karingani's large mammal augmentation program.

KPI 3 | LARGE MAMMAL MANAGEMENT

Karingani's large mammal populations are being restored with care and ecological foresight. The reserve's population augmentation program is advancing steadily, ensuring key species are re-established in line with carrying capacity projections. Strategic surface water management has proven instrumental in guiding seasonal movements and balancing grazing pressure. These efforts reflect a holistic, science-based approach to population management and ecosystem recovery.

Karingani Augmentation Animal Counts

	2022	2023	2024
Zebra	40	274	258
Blue Wildebeest	59	481	322
Impala		674	849
Nyala		296	163
Sable			26
Giraffe		12	
Eland		25	

ALIEN INVASIVE SPECIES
RESULTS

KPI 1 | ALIEN PLANT SPECIES

No new infestations of alien plant species were reported during this period. While no additional mitigation actions were logged, this offers an opportunity to re-survey and confirm the reserve's current status.

Continued vigilance remains essential as movement increases across the landscape, but the current lack of incidents may highlight the benefits of past management and the importance of maintaining momentum.

Highly invasive prickly pear

KPI 2 | ALIEN ANIMAL SPECIES

The integrity of Karingani's perimeter fencing continues to yield results, with zero livestock incursions reported — a testament to the effectiveness of our territorial boundary strategy.

Reports of domestic hunting dogs were comparable to previous periods, and swift, humane interventions ensured minimal risk to native species. The stable trend reflects consistent field awareness and rapid response protocols.

KPI 3 | DISEASE CONTROL

The reserve experienced a single suspected case of anthrax during this reporting period. This isolated incident reinforces the importance of our disease vigilance protocols. While follow-through on carcass management could be improved, the low incidence rate overall suggests that Karingani remains a low-risk environment for disease outbreaks thanks to existing monitoring and response procedures.

TERRITORIAL INTEGRITY

GOAL

To ensure a well-maintained, government-approved delineated barrier that inhibits the exit of wild animals out of the reserve; prevents livestock from entering the reserve and provides an adequate platform for detection technology to be deployed along the eastern boundary of the reserve. The deployment of trained and motivated security staff to vigilantly patrol and follow up on potential breaches of the physical boundary fence and incursions into Karingani. Having a solid territorial foundation safeguards the assets and wildlife which call Karingani home as well protects our neighbours and bordering communities outside of Karingani.

Karingani security team preforming a perimeter check to safeguard Karingani

BOUNDARY AND FENCING
RESULTS

Boundary and thus perimeter fence integrity is a vital aspect of both Karingani's internal conservation management as well as its relations with neighbouring communities. The presence and maintenance of this fence allows for the safe keeping of Karingani assets (wildlife and infrastructure) as well as the protection of communities by mitigating human wildlife conflicts. The perimeter fence provides the technological platform and definitive line towards measuring incursions into and out of the reserve in the perspective of wildlife security and the ultimate aim of restoring the large mammal populations of the reserve.

Reporting regarding fence maintenance and incidents of repairs has been improved over the past report years, which allows for improved accuracy and quantification of both capital and operational inputs required to appropriately maintain the fence towards its functional purpose. Improved data capture and reporting capacity allows for a better analysis of which animals are the main cause of damage, as well as the inputs required to maintain the fence regarding materials and man hours.

KPI 1 | BOUNDARY FENCE

The Karingani perimeter fence continues to play a pivotal role in maintaining ecological boundaries and protecting both wildlife and communities. A notable 30% decrease in perimeter damage incidents compared to the previous year. While operational disruptions affected some reporting consistency, efforts are underway to enhance standard operating procedures and increase response efficiency — laying a strong foundation for continued improvement.

There were 326 perimeter damage events recorded during the Jan-Dec 2024 reporting period.

During the 2024 reporting periods, we recorded the use of the following items for fence repair:

76	Y Standards	**852 m**	Of wire	**6**	Brackets	**36 m**	Of veldspan
11	Droppers	**31**	Bobbins	**0**	Straining posts	**0**	Wire tensioners

Karingani Fencing Team repairing the perimeter fence

COMPARISON OF REPORTING PERIODS

The total number of perimeter damage events recorded show a 30% decrease in the total number of events compared the 2023 reporting period.

18% (60/326) of perimeter damage events were recorded as minor perimeter damage and included tampering, holes under fence and wear and tear. 75% (245/326) were recorded as major perimeter damage events and included all animal break-ins and outs, human and vehicle damage and damage by trees and water.

The average repair time for perimeter damage events for the Jan-Dec 2024 reporting period was 1138 hours. This monthly average however ranges significantly from 0.3 hours to 7.1 hours. The increase in the number of major perimeter damage reports, as well as more materials being used to conduct these repairs, suggests a higher average repair time.

Comparison of total number of perimeter damage events

Comparison of total number of average repair time (HRs) for perimeter damage

DATA INFORMING EVIDENCE-BASED OPERATIONS

At the heart of effective reserve management lies a commitment to continuous monitoring and evidence-based operations. The increase in recorded elephant-related perimeter damage from 42 events (9% of total incidents) in 2023 to 93 events (29%) in 2024 highlights the success of improved monitoring systems and the value of accurate incident reporting. This level of insight directly supports operational decisions, such as the increased use of fencing materials during the 2024 reporting period.

Fence voltage monitoring has been systematically implemented since February 2020, with daily testing conducted by dedicated operations and security teams. These efforts ensure real-time awareness of fence performance. Seasonal patterns have been observed, with lower average voltage readings typically recorded between January and March — a period associated with higher rainfall, which can influence voltage consistency.

Operational response remained active throughout the year, with 37 fence spraying interventions and 2 grass-cutting actions recorded during 2024. Notably, periods of reduced voltage readings were often correlated with increased major damage events and reduced spraying during the October to January period. These insights reinforce the importance of consistent maintenance and highlight how targeted interventions, informed by monitoring data, are critical to maintaining perimeter integrity.

KPI 2 | FENCE MAINTAINED

The integrity of the eastern perimeter fence remained a central operational focus, with proactive patrols and maintenance teams ensuring continued functionality. Most damage was attributed to wildlife, reinforcing the need for coexistence strategies. The data collected is increasingly detailed and valuable, helping to refine materials use, patrol scheduling, and damage response — all indicators of a maturing monitoring system that supports long-term territorial security.

JANUARY - DECEMBER 2024

- Damage by Animal
- Damage by Human
- Damage by Nature (Trees and water)
- Damage by Unknown
- Damage by Vehicle

37% HWC Animals (Buffalo, Elephant, Lions, Hyena, Wild Dog)

44% Other (Giraffe, Kudu, Impala, Waterbuck, Honey badger, etc.)

19% Porcupine

The proportionate percentages out of a total of 326 fence damage events for the period of Jan – Dec 2024 on the Karingani Eastern perimeter fence.

129 deflections / attempted exits by animals recorded on the Eastern perimeter fence
79 fence exits (break-outs)
80 fence entries (break-ins)

Comprehensive monitoring of perimeter integrity continues to inform proactive management strategies within the reserve. Animal-related incidents remain the most significant contributor to perimeter damage, highlighting the importance of species movement tracking and fence resilience.

In 2024, a total of 288 animal-related perimeter damage events were recorded and categorically analyzed for strategic response. Of these, 28% were break-ins (entry from outside into Karingani), 27% were break-outs (exit from within the reserve), and 44% were deflections—indicative of attempted entries (16%) and exits (28%). This detailed breakdown provides valuable insights into animal movement dynamics and informs priority areas for reinforcement and maintenance.

The majority of damage incidents were attributed to elephants, kudu, porcupines, and impala — species that are both ecologically important and physically capable of testing the fence infrastructure. Other species contributing to less than 5% of incidents include buffalo, domestic cattle (external deflections), grey duiker, giraffe, spotted hyaena, lion, nyala, unknown species, warthog, and blue wildebeest. Species with minimal recorded impact (under 1%) included birds, bushbuck, caracal, rhino, and steenbok — demonstrating the effectiveness of current fence structures in deterring smaller fauna.

Elephant activity, in particular, remains a key focal point. In 2024, elephants accounted for 30% of all perimeter damage, with 29% linked to direct fence interaction and an additional 2% from indirect damage via tree-felling. This represents a 20% increase compared to the 2023 reporting period and underlines the need for tailored mitigation strategies specific to elephant behavior.

When comparing overall damage sources across reporting periods, the proportions remained relatively stable. Changes were marginal, with animal-, human-, and unknown-caused damage decreasing slightly (by -0.3% to -0.5%), while damage from natural causes (e.g., water, falling trees) increased by 0.9% and vehicle-related incidents by 0.2%. This consistency speaks to the value of sustained monitoring and reinforces the role of longitudinal data in shaping informed operational responses.

LOOKING AHEAD

By maintaining this high level of detail and consistency in recording perimeter incidents, Karingani continues to build a robust foundation for adaptive reserve management and ecological stewardship.

KPI 3 | MINIMISE HUMAN WILDLIFE CONFLICT

12 EVENTS Of Human-Wildlife-Conflict (HWC) associated with animals exiting Karingani through the completed perimeter fence recorded for the reporting period.

HWC events per animal type, recorded in the neighbouring communities where Karingani teams were able to assist with mitigation and support despite the majority of the animals not emanating form the reserve.

Karingani's efforts to reduce human-wildlife conflict continue to deliver encouraging outcomes. This reporting period saw a reduction in total conflict events, with zero incidents involving lion or spotted hyena and continued responsiveness to elephant and buffalo-related interactions. For the first time, internal HWC events were recorded separately. Collaboration with surrounding communities remains a core component of this work.

HIPPO
APRIL 2019 – MARCH 2020: 01
APRIL 2020 – MARCH 2021: 01
APRIL – DECEMBER 2021: 00
JANUARY – DECEMBER 2022: 01
JANUARY – DECEMBER 2023: 00
JANUARY – DECEMBER 2024: 00
TOTAL 03

ELEPHANT
APRIL 2019 – MARCH 2020: 04
APRIL 2020 – MARCH 2021: 01
APRIL – DECEMBER 2021: 02
JANUARY – DECEMBER 2022: 01
JANUARY – DECEMBER 2023: 10
JANUARY – DECEMBER 2024: 09
TOTAL 27

BUFFALO
APRIL 2019 – MARCH 2020: 01
APRIL 2020 – MARCH 2021: 00
APRIL – DECEMBER 2021: 01
JANUARY – DECEMBER 2022: 00
JANUARY – DECEMBER 2023: 01
JANUARY – DECEMBER 2024: 03
TOTAL 06

LION
APRIL 2019 – MARCH 2020: 02
APRIL 2020 – MARCH 2021: 03
APRIL – DECEMBER 2021: 01
JANUARY – DECEMBER 2022: 00
JANUARY – DECEMBER 2023: 01
JANUARY – DECEMBER 2024: 00
TOTAL 07

HYENA
APRIL 2019 – MARCH 2020: 04
APRIL 2020 – MARCH 2021: 02
APRIL – DECEMBER 2021: 00
JANUARY – DECEMBER 2022: 01
JANUARY – DECEMBER 2023: 02
JANUARY – DECEMBER 2024: 00
TOTAL 09

Karingani scouts watching over a white rhino (Ceratotherium simum) bull

SECURITY STAFF AND COUNTER-POACHING
RESULTS

Wildlife protection through counter-poaching is a key responsibility of Karingani in this greater landscape – with a constantly adapting poaching pressure from outside the reserve, targeting endangered rhino and elephant populations, as well as the commercial bushmeat trade, Karingani has further developed their counter-poaching resources during this reporting period. Key to this strategy is the collection and analysis of data, on a day to day, real-time basis to both measure the level of threat and the amount of effort towards addressing those threats. Field ranger training, support and ultimately long-term retention of those individuals is critical in being able to build long-term and robust counter-poaching strategies and form the key components in Karingani counter-poaching strategy.

### KPI 1 | WILDLIFE SECURITY AND INCURSIONS

A 24% decrease in incursions is a potential sign of reduced poaching pressure or increased deterrence. Karingani's ongoing investment in real-time tracking, field ranger deployment, and data-informed security strategy is supporting proactive wildlife protection. As monitoring systems and training evolve, so too does our ability to detect and respond to emerging threats.

Incursion Events

2018/19	2019/20	2020/21	Apr-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Jan-Dec 2024
336	168	131	66	69	54	41
	Difference	Difference	Difference	Difference	Difference	Difference
	-50%	-22%	-50%	+4%	-22%	-24%

-24% Decrease in incursion events from 2023 to 2024 reporting periods.

+11% Increase in incursions emanating from the Kruger National Park, in the West into Karingani. This amounts to 20% of all incursion into Karingani.

-6% Decrease in incursions emanating from Karingani, in the East into Kruger National Park. This amounts to 7% of all incursions.

-5% Decrease in incursions attributed to Internal poaching and theft in Karingani. This amounts to 73% of all incursions.

0% Change in incursions were attributed to elephant poaching incursion objectives. This amounts to 0% of all incursions.

-3% Decrease in incursions attributed to bushmeat poaching in Karingani. This amounts to 20% of all internal poaching incursions recorded in KGR.

-19% Decrease in the incursions attributed to illegal fishing incursion objective. This amounts to 37% of all the incursions. Illegal fishing was recorded in both the olifants gorge (northern section) and in the Nwanetsi river (southern section).
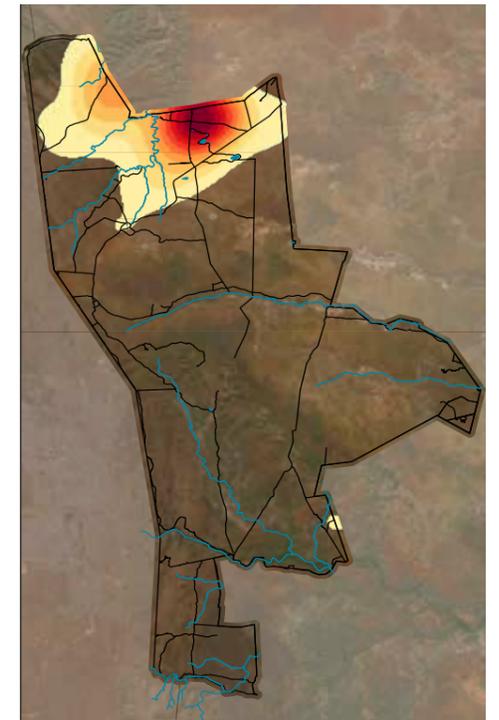
Spatial distribution of incursions illustrates highest poaching pressure in the extreme north of the reserve. Attributed to proximity of poaching communities and depth of the reserve.

Incursion Emanating from Kruger National Park into Karingani

2018/19	2019/20	2020/21	Apr-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Jan-Dec 2024
36%	49%	52%	48%	28%	9%	20%
	Difference	Difference	Difference	Difference	Difference	Difference
	+13%	+3%	-4%	-20%	-19%	11%

Incursion Emanating from Karingani into Kruger National Park

2018/19	2019/20	2020/21	Apr-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Jan-Dec 2024
33%	23%	21%	25%	18%	13%	7%
	Difference	Difference	Difference	Difference	Difference	Difference
	-10%	-2%	+4%	-7%	-5%	-6%

Internal Poaching and Theft

2018/19	2019/20	2020/21	Apr-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Jan-Dec 2024
22%	14%	25%	27%	54%	78%	73%
	Difference	Difference	Difference	Difference	Difference	Difference
	-8%	+11%	+2%	+27%	+24%	-5%

KPI 2 | INCURSIONS ASSOCIATED WITH NEIGHBOURING COMMUNITIES

Security records provide valuable insight into patterns of support or pressure from surrounding communities. A reduction in eastern incursions this year highlights areas of improved collaboration and may guide future community outreach priorities. Strengthening community engagement alongside data-led deployment will remain essential to our long-term success.

-10% Decrease in Eastern incursions for the reporting period.

65%	**10%**	**5%**	**0%**
Cubo	Mapulanguene B1	Mapulanguene B2	Ringane

0%	**0%**	**<2%**
Phanguene	Phanguene	Nkanyani Juda Deca da Vitoria Nyandlopfu Mbakani Khumani Massingir Safaris Ferreria Joka

*Based on summary community data - not proportion along fence line

KPI 3 | POACHING INCIDENTS

Karingani continues to hold the line against poaching with measurable success. Despite the tragic loss of one rhino — the first since 2017 — no elephant or poisoning-related deaths were recorded. With continued improvements in intelligence and rapid response, the reserve is better positioned than ever to prevent and respond to illegal activity. The presence of snares was limited and addressed promptly, reinforcing the value of patrol coverage and local intelligence.

BUSHMEAT POACHING

In 2024, 12 incursions were recorded as being associated with bushmeat hunting. While two confirmed poaching incidents occurred inside the reserve — a kudu (unknown sex and age) linked to hunting dogs and a vervet monkey linked to snaring — these isolated events had no measurable negative impact on the stability or viability of the broader mammal populations within the reserve.

The presence of hunting dogs, often a precursor to bushmeat activity, was noted on 12 separate occasions. These detections were tied not only to incursions but also to evidence found during patrols investigating perimeter disturbances and invasive species sightings. The ability to detect, document, and correlate such patterns is central to refining enforcement patrol routes and resource allocation.

ILLEGAL FISHING

Since April 2021, illegal fishing activity has been systematically tracked within the Olifants Gorge. In a new development, the 2024 reporting period marked the first recorded incidents of illegal fishing in the Nwanetsi River in five consecutive reporting periods — reinforcing the value of continuous surveillance in detecting shifts in threat patterns.

Thanks to rapid response and collaborative interventions, 209 individual fish were recovered through arrests and contacts during the year. Although these fish were not weighed, the recovery itself reflects the reserve's commitment to curbing unsustainable resource extraction and preserving aquatic biodiversity.

These insights highlight the indispensable role of structured incident logging in enhancing anti-poaching strategies and supporting long-term ecological integrity across the reserve.

209 Individual fish illegally poached by fisherman

0 Recorded animals lost to poison

0 Recorded animals for bushmeat lost to poaching with firearm

3 Recorded snares discovered and removed (note: 62 snares removed **externally** along fence-line)

1 Recorded animals lost to snares

KPI 4 | FIELD RANGER FORCE

Plans for 2025 will revitalize the ranger force through structured retraining, internal leadership development, and intelligence-led operations. By building internal training capacity, Karingani is empowering its staff and ensuring consistent, high-quality deployment. This approach lays the groundwork for stronger performance, increased morale, and long-term field readiness.

KPI 5 | PATROLLING AND DEPLOYMENT

Patrolling efforts remained consistent and widespread, with over 14,000 recorded perimeter patrols. Although challenges such as delayed responses and resource limitations persist, strategic deployment and improved data collection are guiding a more targeted, efficient approach. K9 integration and time-on-track metrics provide vital insights that will enhance future tracking success.

14 Active follow-ups were conducted during this reporting period

26.3 km Covered by field rangers on all tracking efforts (follow up and back tracks)

36.3 hrs Of active tracking (These statistics do not include deployment times, stopper group hours and distances covered to aid in follow ups or reach tracks.)

27% Of all incursions were active follow-up

52% Of all incursions were classified as "no follow-ups." Of this 89% were due to the exit already being located, 7% were abandoned and 4% were due to a handover taking place.

PERIMETER AND INTERNAL PATROLS REPORTING PERIOD:

14,018 Total (perimeter and internal) patrols recorded for this reporting period. This includes both perimeter and internal patrols.

13,842 Total perimeter patrols were recorded.

805 Total internal patrols were recorded.

WAYLAYS OR OBSERVATION POINTS FOR REPORTING PERIOD:

5,696 hrs Spent on 526 field based security observation posts, waylays and ambushes (97% of these were dedicated to waylay or ambush, 3% to conservation survey/asset monitoring.

K9 EFFORT AND SUCCESS

8 Total active follow-up and patrols with K9

12 km Total distance covered by K9 during active follow-up and patrols with K9

16 hrs Total hours on the ground during active follow-up and patrols with K9

1 Poacher contacts made with the aid of the K9 Teams

KGR K9 and handler

The K9 unit continues to play a vital role in rapid response and follow-up operations within the reserve. Across both helicopter and vehicle deployment methods, the average time from deployment to arrival on-site was 1.66 hours — a reflection of the team's consistent readiness and logistical coordination.

During active follow-ups, the K9 unit tracked at an average speed of 0.8 km/h. These insights help refine future deployment planning and can guide further training or resourcing strategies to optimize effectiveness.

HELICOPTER AND VEHICLES:

Helicopter deployments demonstrated strong efficiency, with an average response time of 0.85 hours (ranging from 0.68 to 1.28 hours), enabling swift access to high-priority areas. Vehicle deployments, while naturally slower due to terrain and distance factors, averaged 3.57 hours (range: 3.07–4.08 hours), highlighting the importance of maintaining multiple deployment options for diverse operational contexts.

LOOKING AHEAD

By continuing to capture and analyze detailed operational data, Karingani enhances the effectiveness of its response teams and supports the reserve's broader conservation and protection efforts.

KPI 6 | POACHER CONTACTS AND ARRESTS

Seven direct poacher contacts were achieved during the reporting period, reflecting 13.5% of track string follow-ups. While arrest and confiscation rates vary, the continued effort reflects growing operational efficiency. Each engagement represents a step forward in deterrence and protection for vulnerable species.

Contact Rate on Hot Pursuit Follow-ups (fresh tracks)

2018/19	2019/20	2020/21	Apr-Dec 2021	Jan-Dec 2022	Jan-Dec 2023	Jan-Dec 2024
42%	48%	75%	38%	37%	50%	9%
	Difference	Difference	Difference	Difference	Difference	Difference
	+6%	+27%	-37%	-1%	13%	-41%

KPI 7 | POACHING IMPACT

One rhino was lost to poaching in 2024, the first such incident in seven years. While a difficult event, the broader context of consistently low poaching impact underscores the success of existing strategies. Ongoing training, intelligence coordination, and swift field response will continue to drive this positive trajectory.

SUPPORT SERVICES
RESULTS

KPI 1 | JOINT OPERATIONS WITH KEY STAKEHOLDERS

Karingani continues to play a vital role in regional anti-poaching networks. Close coordination with Kruger National Park and ANAC has supported shared communication platforms, staff integration, and security operations beyond the reserve's borders. These partnerships amplify the reserve's conservation impact and build trust with public sector allies.

KPI 2 | LEGAL COMPLIANCE AND PROCESSES

While no new sentencing data was captured this year, existing legal protocols remain in place to hold offenders accountable. Strengthening feedback systems and ensuring transparent follow-up with legal partners will enhance future reporting and enable clearer demonstration of legal outcomes.

KPI 3 | AIR SUPPORT

Karingani's helicopter logged 299 flight hours this year, providing vital support across conservation, security, medical, and logistical operations. Slight shifts in flight purpose reflect evolving operational needs, while overall flight availability continues to enhance the reserve's agility and response capability.

For reporting purposes, Flight Hobbs hour data was used to show actual time in air. Of the 299 hours flown from January to December 2024:

51.1 Hours dedicated to security

67.3 Hours dedicated to conservation

44.05 Hours dedicated to general reserve management and operations

3.7 Hours dedicated to medical

14.3 Hours dedicated to hospitality support and property services

KPI 4 | INTELLIGENCE GATHERING AND USE

Strategic intelligence gathering progressed steadily, with emphasis placed on building internal capacity and cross-agency collaboration. Upcoming improvements in digital data flow and partner alignment will increase the precision and relevance of intelligence to support field operations.

KPI 5 | TECHNOLOGY APPLICATION

Karingani's adoption of ESRI's ArcOnline platform marks a major step forward in data management and decision support. Integrated real-time monitoring, spatial mapping, and workflow customization now allow for streamlined reporting, reducing errors and improving transparency. This forms a critical foundation for scaling up smart conservation.

LANDSCAPE INTEGRITY

GOAL

To quantify, record and restore the functional and visual integrity of the Karingani landscape, with particular reference to the impact and disturbances from past human activities. Full restoration of the ecological and spatial connectivity within Karingani towards contributing to the larger conservation landscape and a balanced ecological system.

Sweeping views over Karingani

PAST HUMAN IMPRINT
RESULTS

KPI 1 | SITES OF HUMAN HABITATION

Although no new clearings occurred this period, previously cleared sites continue to show positive signs of passive restoration. The project remains a cornerstone of landscape rehabilitation and will benefit from renewed prioritization in the year ahead.

KPI 2 | AGRICULTURAL INFRASTRUCTURE

Although no new clearings occurred this period, previously cleared sites continue to show positive signs of passive restoration. The project remains a cornerstone of landscape rehabilitation and will benefit from renewed prioritization in the year ahead.

KPI 3 | WEIRS, DAMS AND DAM WALLS

Although no new restoration took place, priority remains high to address hydrological infrastructure affecting water flow and elephant impacts. Planning is underway to reinitiate these interventions, which will play a key role in supporting ecosystem balance.

GEOMORPHOLOGY, HYDROLOGY AND SOIL
RESULTS

KPI 1 | GEOMORPHOLOGY INTEGRITY
KPI 2 | HYDROLOGICAL INTEGRITY
KPI 3 | SOIL INTEGRITY

Digital mapping and analysis of geomorphological and hydrological systems began during this period, laying the foundation for future interventions. Ground-truthing and data integration will inform practical strategies to restore soil health and watershed function across the reserve.

CONNECTIVITY RESTORED
RESULTS

Connectivity within and between landscapes and ecosystems is critical for the natural enhancement and maintenance of diversity within communities and ecosystems. Connectivity is broken down in a system by habitat fragmentation (due to development) and physical barriers (fences, roads and dam walls). Restoring connectivity by re-establishing critical landscape linkages will buffer the reserve against future shocks such as drought, extensive run-away fire and climate change.

Animal species movement data is a metric of establishing the extent to which and where connectivity exists within the landscape. Currently focused on mobility of large mammals (tracking ease and availability) with results of baseline and repeat surveys for smaller animals that will be significant contributors to understanding this connectivity.

KPI 1 | LANDSCAPE FLOWS

Karingani remains a key contributor to landscape connectivity in the Greater Limpopo Transfrontier Conservation Area. While formal fence removals are pending, wildlife movement remains largely unrestricted, ensuring continued gene flow and access to seasonal resources.
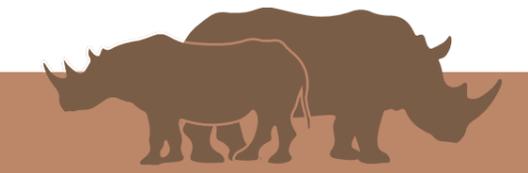
130 Rhino recorded sightings in Karingani over January - December 2024

These are transient black and white rhino throughout the landscape, their presence and absence is heavily determined by varying rainfall and vegetation state at different times of the year. It is important to note that some reported individuals could be the same individual sighted at a later time.

KPI 2 | GENE FLOWS

Initial assessments suggest no artificial gene flow augmentation is needed at this stage. Natural movement between reserves is facilitating healthy population interaction, with further genetic research to inform future requirements.

KPI 3 | HABITAT LINKAGES

As human activity retreats and natural systems rebound, habitat linkages are visibly strengthening. This improves species movement, resilience to climate shocks, and overall ecosystem functionality across Karingani.

BIOTIC STRUCTURE AND DIVERSITY

GOAL

To quantify, measure and restore, where necessary, the fauna and floral structure and species diversity of the Karingani landscape.

Zebra (Equus quagga) and impala (Aepyceros melampus) at Karingani

VEGETATION STRUCTURE
RESULTS

KPI 1 | VEGETATION MONITORING IN PAST-IMPACTED AREAS

Passive rehabilitation of impacted vegetation sites is showing positive signs. No active remedial actions were needed this period, indicating that prior interventions and natural recovery processes are delivering intended outcomes.

PLANT DIVERSITY
RESULTS

KPI 1 | DIVERSITY MEASUREMENTS AND SURVEYS

We continue to conduct vegetation surveys towards establishing the baselines of the restoration potential. Included in this is the research collaboration currently being established to monitor the distribution and impacts by elephants of baobab trees in the Karingani landscape. This study includes the consideration of distance from water, topology and past human presence.

Wild flowers at Karingani

ANIMAL DIVERSITY
RESULTS

KPI 1 | INCIDENTAL ANIMAL SIGHTINGS

The growing database of incidental sightings continues to enrich Karingani's biodiversity knowledge. These staff-contributed records are vital for identifying rare species, habitat use, and informing conservation planning as trends become more robust over time.

SIGHTINGS: JANUARY – DECEMBER 2024

73 Elephant	50 Wild Dog	45 Giraffe
41 Buffalo	68 Lion	36 Zebra
37 Leopard	18 Spotted Hyena	5 Cheetah
10 Impala	40 Wildebeest	3 Kudu
2 Nyala	2 Warthog	0 Waterbuck
4 Southern Ground-Hornbill	10 Sable Antelope	7 Pangolin
0 Civet	0 Bushpig	2 Caracal

KPI 2 | LARGE MAMMAL SURVEY

The 2024 aerial survey confirmed continued growth in key herbivore populations and stable metabolic balance across species. Seasonal movement patterns, especially in elephants, reinforce the value of the water augmentation strategy and highlight Karingani's functional role in the wider landscape.

GREEN SEASON ELEPHANT SURVEY

To build a more complete understanding of seasonal elephant dynamics in Karingani, a dedicated Green Season Elephant Survey was undertaken in 2024. This complements the reserve's historic focus on dry-season surveys and provides a valuable perspective on temporal movement patterns.

Initial results indicate a notable reduction in elephant numbers compared to previous dry-season counts — with 188 to 439 fewer individuals observed. While these figures require further verification through follow-up surveys, the data strongly suggest that elephant populations are exhibiting significant seasonal mobility across the broader landscape.

This movement pattern aligns well with Karingani's strategic water augmentation approach, which limits dry-season surface water availability in order to reduce prolonged herbivore pressure on sensitive habitats. The survey findings reinforce the importance of this strategy in promoting landscape-scale movement, easing ecological pressure during peak resource stress, and maintaining long-term habitat resilience.

LOOKING AHEAD

The 2024 survey marks an important step in refining elephant management decisions. Future green season surveys will be crucial in validating these patterns and guiding both water management and any potential fencing interventions. These insights are central to maintaining ecological balance while supporting the needs of a large and growing elephant population.
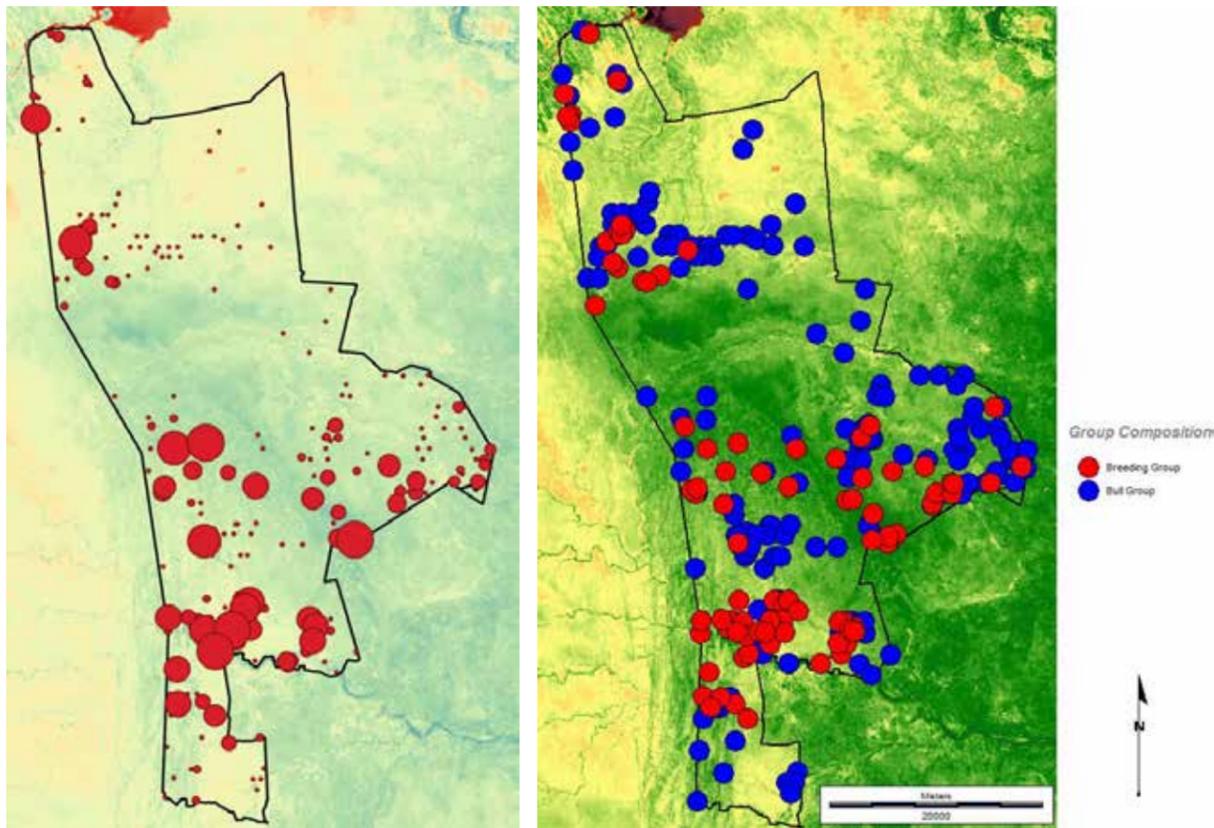
Spatial distribution of elephants with circle size indicating density May 2024

Spatial distribution of elephants comparing groups a. group size and b. breeding and bull groups in Karingani in May 2024

KPI 3 | VULTURE AND STORK SURVEY

The white-backed vulture nesting trend remains encouraging, with 2024 figures reflecting positive growth. Standardizing survey timing going forward will ensure improved trend reliability and support ongoing species recovery initiatives.
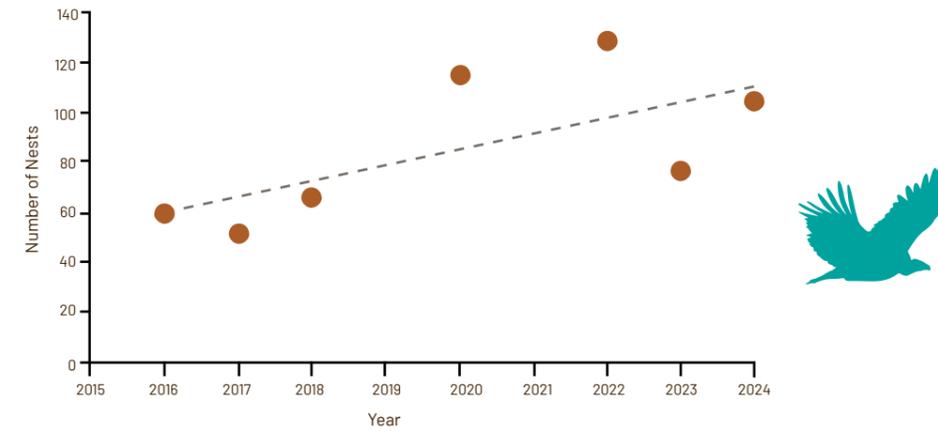
The apparent trend in nesting white-backed vultures in Karingani appears positive. The 2023 estimate falls below the general trend which is most likely due to the fact that the survey was undertaken a month later than other surveys and thus more time for nests to have been abandoned and fallen down. This emphasises the importance of repeat surveys at the same time of the year. The 2024 survey results, given the timing of the survey are more reflective of the positive trend in growth displayed through past surveys and may be indicating a levelling off. This will only be confirmed with subsequent surveys.

KPI 4 | LARGE MAMMAL RE-ESTABLISHMENT

Reinforcement translocations of wildebeest, impala, zebra, nyala, and sable are advancing well under the large mammal management strategy. These augmentations contribute to species balance and biodiversity restoration, with all reintroductions aligned to habitat capacity.

322 Wildebeest — 113 in North / 137 in Central / 72 in South

26 Sable — 26 in South

163 Nyala — 45 in Central / 118 in South

258 Zebra — 53 in North / 109 in Central / 96 in South

849 Impala — 310 in North / 220 in Central / 319 in South
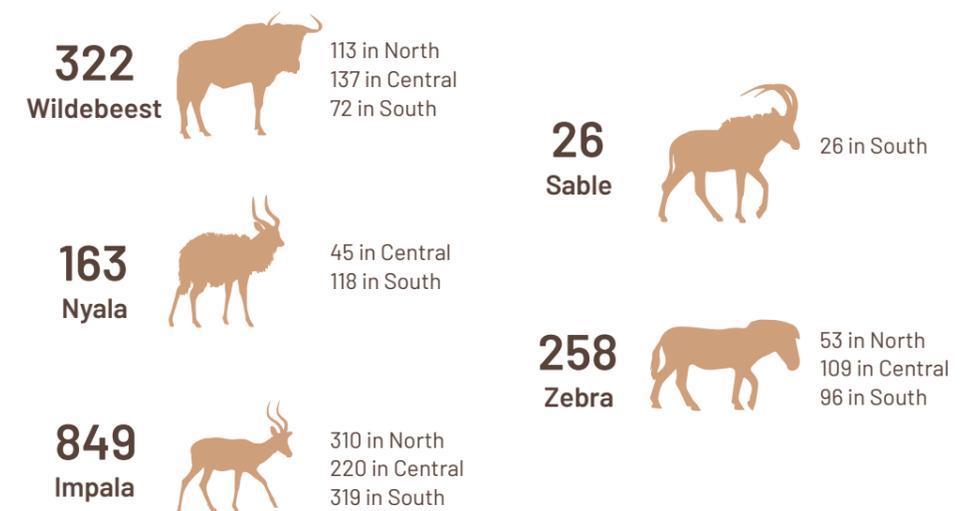
ECOSYSTEM FUNCTION

GOAL

To restore and maintain physical processes, productivity and functioning with particular consideration to the impact and disturbance of past human habitation. To restore and maintain the characteristic trophic interactions within the reserve where impacted by the past and ensure future development is responsibly aligned.

Endangered wild dogs (Lycaon pictus) playing in a mud puddle at Karingani

PRODUCTIVITY AND CYCLING
RESULTS

KPI 1 | HERBACEOUS PRODUCTIVITY

The Normalized Difference Vegetation Index (NDVI) remains one of Karingani's most valuable long-term data streams, now extending over 14 consecutive years. NDVI provides a consistent, remotely sensed measure of live green vegetation, its distribution across the reserve, and its seasonal productivity. It plays a critical role in fire management planning, guiding herbivore movement strategies, and assessing the ecological health of the reserve over time.

Despite a 50% reduction in rainfall across all sections of the reserve in 2024 — one of the driest years in recent records — NDVI data confirmed continued, although seasonally constrained, primary productivity. Vegetation greenness began declining unusually early in mid-May, with peak dryness reached by August. Greening only resumed in late December, directly tied to the onset of rainfall. This marks a concerning shift in seasonal patterns compared to earlier years and reinforces the importance of real-time NDVI monitoring as a tool for early warning and planning.

Analysis of the NDVI record supports a consistent seasonal pattern: a six-month period of lower vegetation productivity from June to November, with the driest month consistently being September. These insights are fundamental for scheduling prescribed burns, implementing firebreaks, and managing fire risk — which peaks between August and October each year.

An emerging hypothesis — now being explored through NDVI–rainfall correlations — suggests that hydrological rehabilitation, including road decompaction and the removal of legacy infrastructure, may be contributing positively to localized vegetation resilience. As passive and active restoration continues, the effects on soil moisture retention and length of the growing season are becoming increasingly observable, especially during marginal rainfall years like 2024.

This hypothesis, if confirmed, would demonstrate how landscape restoration contributes directly to vegetation productivity, supporting both ecological integrity and carrying capacity. To validate this, integration of NDVI with LiDAR analysis and high-resolution rainfall data is a priority going forward.
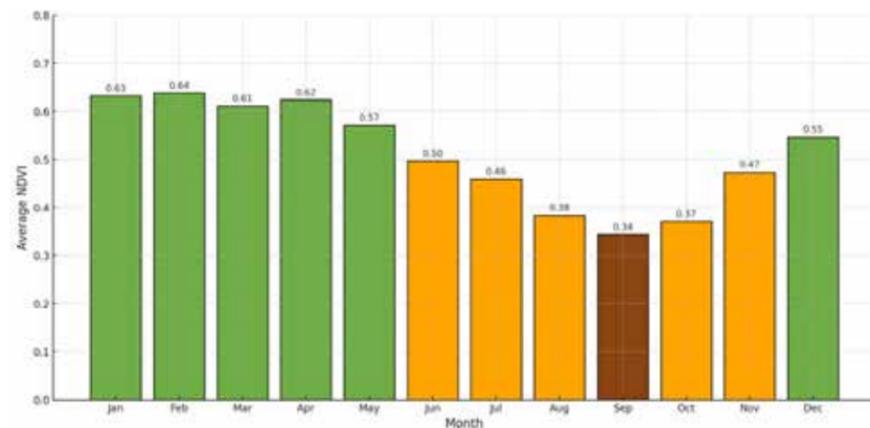
Annual average NDVI for Karingani 2024

HABITAT INTERACTIONS
RESULTS

KPI 1 | TROPHIC INTERACTIONS

The restoration of trophic interactions — the energy transfer from plants to herbivores to predators — is central to Karingani's long-term conservation mission. NDVI provides an indirect but highly effective measure of energy capture at the base of the trophic pyramid, and its increasing trend since the drought year of 2015/2016 reflects the system's slow but steady ecological recovery.

This increase in primary productivity has supported a significant growth in large herbivore populations. Based on seven years of aerial census data, the standing biomass of large herbivores in 2024 was estimated at 35.4 kg/ha, approaching the calculated ecological carrying capacity of 40.7 kg/ha. This expansion, largely driven by elephant, buffalo, kudu, zebra, and impala, reflects a restoration of ecosystem function — but also highlights emerging management needs.

Of particular importance is the role of elephants, whose metabolic mass contribution far exceeds that of any other species, reflecting both their ecological importance and potential for landscape-level impact. The slowing of elephant population growth observed in 2024, for the first time in several years, may be attributed to the strategic limitation of artificial surface water — a deliberate effort to mimic natural seasonal water scarcity and encourage movement.

The continued strengthening of these trophic interactions, especially with the anticipated recovery of medium-sized grazers like wildebeest and zebra through augmentation, is expected to support predator recovery (e.g., lions), which in turn may balance predator-prey dynamics and reduce pressure on smaller, vulnerable species.

CONCLUSION

The integrated tracking of NDVI, herbivore biomass, rainfall, and hydrological interventions provides Karingani with a robust platform for adaptive ecological management. As climate patterns shift and rainfall windows narrow, maintaining and expanding this monitoring framework will be essential. In particular, the delayed onset and shortening of the rainy season — now becoming evident through NDVI trends — must be closely monitored, as it will affect not only plant growth but the overall resilience and biodiversity of the reserve. Continuous improvement in data infrastructure, including automated weather stations and remote sensing platforms, is therefore a strategic priority moving forward.
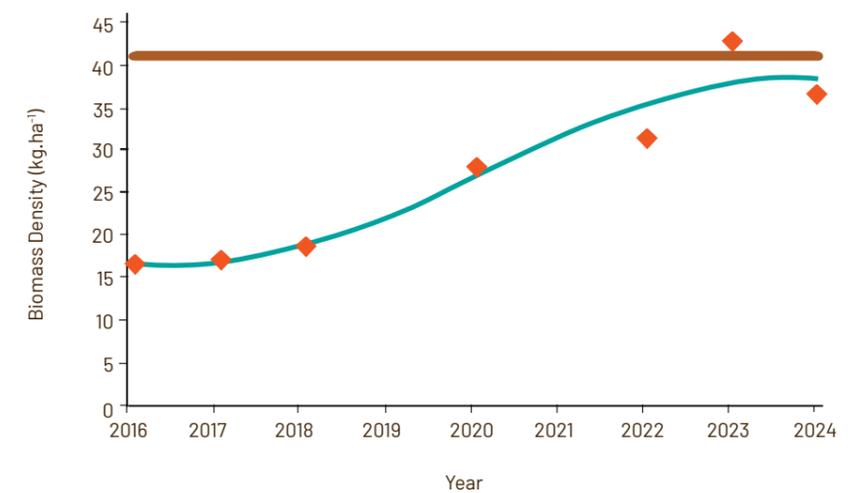
RESEARCH AND COLLABORATIONS

GOAL

To establish relationships and collaborations with like-minded academic institutions, conservation driven organisations and individuals to encourage best practice science and conservation at a landscape-level. Recognising the critical role Karingani plays in the larger landscape and ensuring its restoration is documented and adds value to the global scientific, research and conservation communities.

A collaborative project between Karingani and Mozambique Wildlife Alliance to tag and monitor rhinos

TEMPORAL MOVEMENT OF WILDLIFE AND WILDLIFE MONITORING

Functional ecological connectivity remains a cornerstone of Karingani's conservation strategy. In a fragmented and increasingly climate-vulnerable world, restoring and preserving wildlife movement corridors is critical for supporting species diversity, genetic exchange, and the reserve's broader ecological resilience. At Karingani, connectivity is monitored not only through spatial planning and infrastructure assessments, but also through the temporal movement of wildlife, particularly large mammals such as elephant and rhino.

In 2024, tracking data — especially from GPS-collared elephants — provided valuable insights into how animals navigate the reserve across seasons. LoRaWAN gateways across the reserve relay data from elephant collars, which confirmed clear movement patterns across and beyond Karingani's boundaries. The 2024 Green Season Elephant Survey provided additional clarity, revealing significantly lower in-reserve elephant counts compared to dry season surveys — supporting the understanding of seasonal migratory patterns and cross-boundary landscape use.

INSIGHTS:

1. Key connectivity nodes between Karingani and the Kruger National Park were identified, particularly in the north and along the Nwanetsi River, confirming the reserve's integration into a broader transboundary landscape.

2. Elephant presence declined during the dry season, likely influenced by water availability — a validation of the surface water strategy's effectiveness in promoting natural movement and reducing dry-season concentration.

3. Intra-reserve movements followed drainage lines and riparian corridors, highlighting these as vital conduits for seasonal dispersal and resource access.

4. Hydrological features (natural and artificial) played a clear role in shaping spatial use, reinforcing the importance of strategic water distribution in driving landscape-scale movement dynamics.

LOOKING AHEAD

Maintaining and expanding the collar network and maintaining LoRaWAN functionality will be essential to ensure uninterrupted spatial data flow — particularly as climate variability, species pressures, and conservation decisions become increasingly data-driven. Additional collaring of predators and smaller species, combined with LiDAR and camera trap integration, will further enhance Karingani's ability to map and manage ecological connectivity at multiple scales.

As Karingani continues its ecological restoration journey, real-time movement data and spatial ecology remain indispensable in guiding decisions that strengthen resilience, enhance biodiversity, and support coexistence across this dynamic landscape.

ACTIVE WILDLIFE TRACKING COLLARS AND TAGS

ELEPHANT
ACTIVE **26**

2020: 02	2023: 28
2021: 02	2024: 26
2022: 27	

WILD DOG
ACTIVE **09**

2020: 00	2023: 14
2021: 04	2024: 03
2022: 08	

GIRAFFE
ACTIVE **13**

2020: 00	2023: 16
2021: 00	2024: 13
2022: 06	

VULTURES
ACTIVE **08**

2020: 00	2023: 10
2021: 00	2024: 08
2022: 06	

OTHER
ACTIVE **33**

SABLE: 03	ELAND: 06
KUDU: 02	IMPALA: 05
ZEBRA: 04	NYALA: 03
WILDEBEEST: 10	

Active January - December 2024
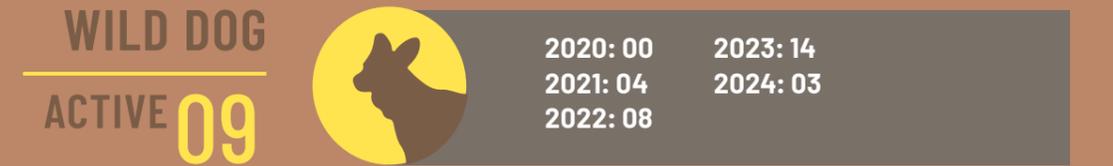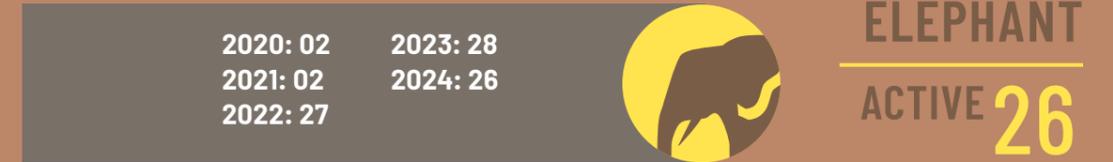
Collar counts from collars that reported during the 2024 year, but not necessarily active for the duration of the whole year

MASSINGIR DAM FISH & FISHERIES ASSESSMENT

Karingani partnered with Advance Africa Management Services to conduct a baseline assessment of Massingir Dam's fish stocks and artisanal fishery. While the full study is expected to conclude in May 2025, preliminary 2024 data revealed the following:

KEY FINDINGS

Fishery Overview:

- 385 active vessels operating across 17 shoreline zones.
- Estimated annual harvest: 465 tonnes, dominated by tilapia species (Coptodon rendalli: 39.6%, Oreochromis mossambicus: 34.4%).
- 48% of C. rendalli catches below maturity size, indicating potential over harvesting risks.

Gear Use:

- Gillnets (3–5 inch mesh) most common, with 35% using non-compliant 3-inch nets.
- High incidence of illegal fish-driving techniques observed.

Regulatory Challenges:

- Low compliance with Mozambique's 2022 Inland Fisheries Regulations (Decree No. 21/2022), particularly in licensing and gear restrictions.
- Limited enforcement capacity and fisher participation in rule-making.

COMMUNITY ENGAGEMENT

- Fishers expressed willingness to collaborate on monitoring and co-management if supported with training and safety equipment.
- Women traders face logistical barriers, including lack of cold storage and high transport costs.

LOOKING AHEAD

- Finalise heavy metal analysis (Hg, Cd, As) in fish tissue for food safety insights.
- Develop a fisheries management plan addressing:
  - Gear selectivity adjustments to protect immature fish.
  - Infrastructure upgrades (solar cold storage, improved drying racks).
  - Ghost gear removal campaigns.
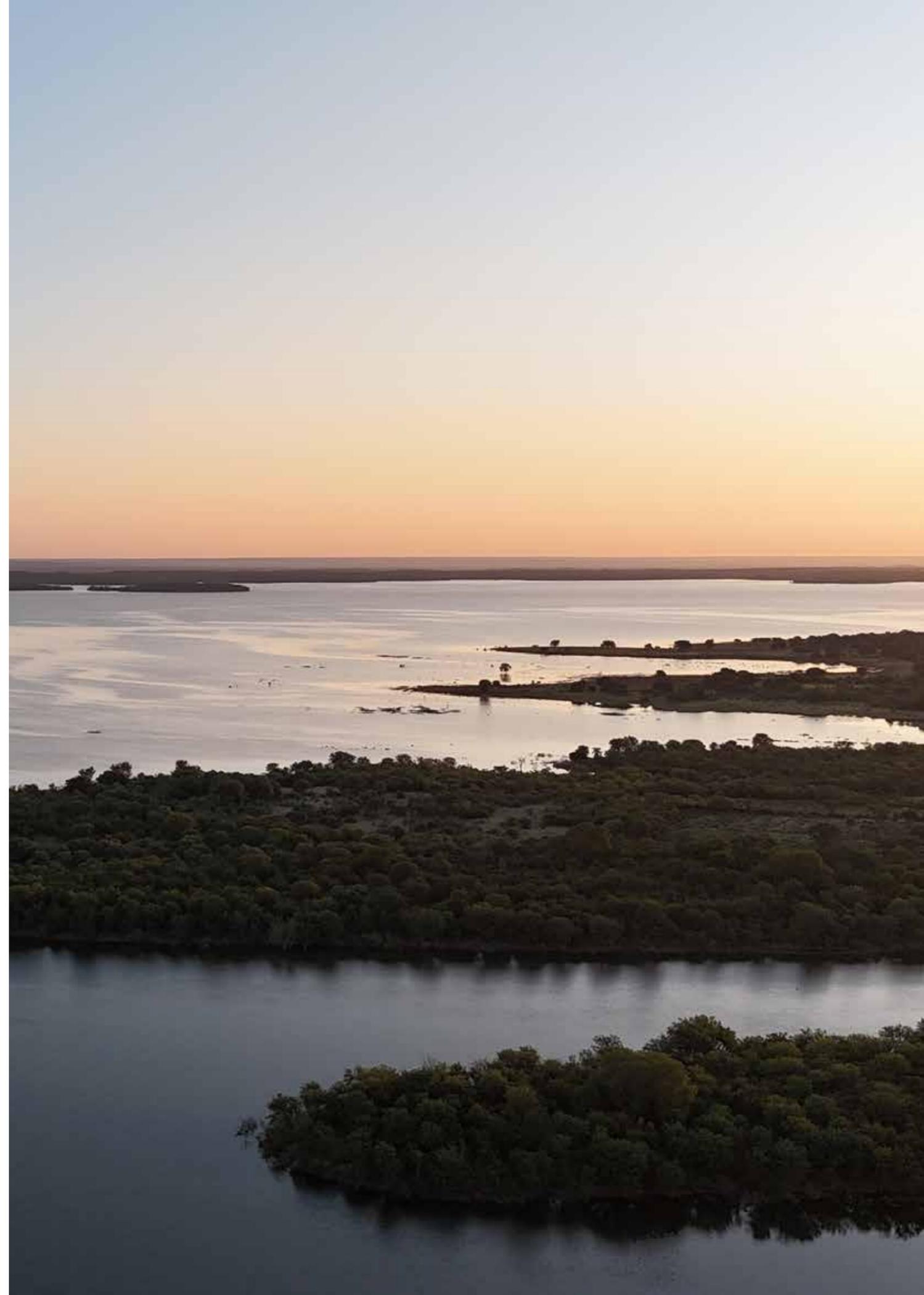
BUILT ENVIRONMENT AND SUSTAINABILITY

GOAL

To restore and maintain physical processes, productivity and functioning with particular consideration to the impact and disturbance of past human habitation. To restore and maintain the characteristic trophic interactions within the reserve where impacted by the past and ensure future development is responsibly aligned.

New infrastructure at Mbilu in Karingani

ENERGY AND CARBON
RESULTS

KPI 1 | REDUCED CARBON FOOTPRINT

In line with our targets to minimise and support efficient use of energy, this reporting period has seen continued data collection and analysis towards establishing per capita baselines of current energy consumption and carbon emissions. This refinement allows us to better account for occupancy fluctuations and provides a more meaningful metric for potential future reduction targets.

ENHANCING ENERGY CONSUMPTION AND CARBON EMISSIONS REPORTING

In 2024, Karingani made significant strides in refining its approach to energy and emissions reporting. We transitioned from U.S. EPA conversion factors to the IPCC 2006 Guidelines, tailored to Mozambique's national reporting framework. This shift improves the accuracy of our carbon accounting and supports alignment with national greenhouse gas inventories.

Key developments this year include:

- Establishment of per capita baselines for fuel consumption and carbon emissions to better reflect operational scale and efficiency.
- Adoption of IPCC-aligned factors, incorporating methane (CH_4) and nitrous oxide (N_2O) emissions. This increased reported emissions by 22.9%, offering a more realistic reflection of local combustion conditions.
- Introduction of new daily per capita metrics:

Petrol

0.4 L Per person per day   **1.2 kgCO$_2$e** Per person per day

Diesel

2.2 L Per person per day   **7.4 kgCO$_2$e** Per person per day

To improve emissions tracking further, we are investing in better fuel monitoring systems, GPS-based emissions profiling, and emissions testing of generators.

Additionally, we launched a major solar PV installation at Mbilu, with a total capacity of 270 kWp and battery storage of 765 kWh. This system is expected to meet 93% of Mbilu's energy demand and displace approximately 140,000 litres of diesel annually, preventing ~414 tonnes of CO_2e emissions per year.

These efforts mark a pivotal step in our commitment to data-driven sustainability, contributing meaningfully to Mozambique's emissions reduction goals and setting a solid foundation for future reductions.

WATER
RESULTS

KPI 2 | REDUCED WATER CONSUMPTION

We recognise the critical importance of water stewardship in our landscape conservation and operational activities. This reporting period marks a significant shift in our approach to water management, focusing on establishing comprehensive baselines, implementing advanced infrastructure, and enhancing our data collection methods.

ENHANCED INFRASTRUCTURE & SAFETY

- Installed advanced water treatment systems (reverse osmosis, filtration, UV disinfection) at boreholes to ensure potable water quality.
- Continued use of underground aquifers via solar/generator-powered pumps for primary water supply.

DATA COLLECTION & MONITORING IMPROVEMENTS

- Tracked per capita water consumption to establish baseline usage across operational areas.
- Developed a dual water use reporting system distinguishing between potable and non-potable water.
- Strategy in place to implement IoT-enabled sub-metering for real-time monitoring and leak detection in 2025.

SUSTAINABLE WATER MANAGEMENT INITIATIVES

- All new buildings now equipped with 5,000L rainwater harvesting tanks.
- Developed a greywater recycling strategy for reuse in irrigation and cleaning (implementation in 2025).
- Rolling out smart irrigation and water-efficient fixtures in new and existing infrastructure.
- All water-consuming equipment must meet global best-practice efficiency standards.

WATER CONSUMPTION OVERVIEW

2024 Water Consumption

Karingani Internal
45,210 kL

Communities
94,000 kL

CHALLENGES & OUTLOOK

- Incomplete data from some boreholes (e.g., Mbilu and construction-related sites) affected reporting accuracy.
- A comprehensive water metering system will be rolled out in 2025 to improve accuracy and coverage.

In future reporting periods, we aim to provide detailed, strategic water conservation systems, including rainwater harvesting, greywater reuse planning, and IoT-enabled monitoring rollout for 2025. These initiatives support our goal to decrease groundwater extraction while improving the reliability of water access. The baseline of 460 liters/person/day gives us a meaningful metric for future water reduction and reuse targets.

WASTE
RESULTS

KPI 1 | WASTE REDUCTION

In 2024, Karingani made important strides in implementing its waste management strategy, moving from planning to meaningful on-the-ground action. Our efforts focused on reducing environmental impact, embedding sustainable practices into our operations, and engaging with neighbouring communities to foster shared responsibility. These actions are central to our long-term vision of circular resource use and environmental stewardship.

A central outcome of this period was the establishment of a functioning waste management system at our Mbilu operations hub, where waste segregation, processing, and tracking are now conducted routinely. From September to December 2024, we recorded 6,290 kg of waste, achieving an 81% diversion rate from landfill. This reflects a significant shift in our approach to resource recovery and reuse.

WASTE DIVERSION SUCCESS

81% of total waste diverted from landfill.

51% of total waste was food-related and completely diverted via composting and community donations for livestock feed

Full diversion of cardboard (14%), PET (6%), glass (6%), and metal/cans (3%).

REDUCTION IN GREENHOUSE GAS EMISSION

3.97 metric tons of CO_2e reduced through improved waste practices.

SEGREGATION INFRASTRUCTURE

Colour-coded bins for paper/cardboard, dry mixed recyclables, food waste, general waste, and e-waste placed across operational areas and housing.

OPERATIONAL CENTRALISATION

A central waste management facility established at Mbilu for sorting, weighing, and secure storage of hazardous materials like used oil.

STRATEGIC PARTNERSHIPS

A key development this year was our strategic partnership with AMOR (Associação Moçambicana de Reciclagem), Mozambique's leading recycling NGO. This collaboration supports the creation of a fully circular waste management strategy for Karingani and neighbouring communities. Key initiatives include the establishment of local waste transfer sites and the use of KOLEKT, a digital tracking app developed under the EU's Africa RISE programme. This system ensures transparent tracking, formal certification, and the development of reverse logistics routes for recyclable materials to reach processors in Maputo. The partnership also aims to tackle traditionally non-tradable waste streams—such as contaminated plastics and construction debris—through innovative reuse strategies.

LOOKING AHEAD

- Expand the waste management system beyond Mbilu to other parts of the reserve in 2025.
- Address the remaining 19% of general waste that was not diverted.
- Innovate around traditionally non-tradable waste streams, such as contaminated plastics and construction debris.
- Advance community engagement and training on waste minimisation and segregation.
- Maintain momentum toward our goal of 100% waste diversion by 2026.

Waste management at Mbilu

MATERIAL & RESOURCE CONSUMPTION
RESULTS

KPI 1 | SUSTAINABLE MATERIALS AND CONSTRUCTION PRACTICES

Karingani's infrastructure development at Mbilu demonstrates our commitment to low-impact construction practices. In 2024, we effectively contained environmental disturbance by ensuring construction zones were clearly demarcated and well-managed. Vegetation was retained wherever feasible, with specimen trees protected and only approved trees removed. As we move into 2025, the introduction of ESRI Survey123 will allow us to digitally monitor and adapt our construction sustainability practices in real time, setting a new standard for ecological sensitivity in infrastructure rollouts.

KEY PRACTICES IMPLEMENTED

1. Sustainable Construction Management:

    - Site Planning: the construction yard is located away from sensitive areas, ensuring minimal disturbance to natural habitats. Ablution facilities are provided, and open fires are strictly prohibited.

    - Environmental Compliance: All construction activities adhere to relevant environmental authorizations and permits, ensuring compliance with local regulations.

2. Site Demarcation and Boundary Control:

    - The construction site is clearly demarcated to prevent unauthorized access and minimize visual and noise disturbances.

    - All construction activities are confined within designated boundaries to protect sensitive environments.

3. Grading, Erosion, and Dust Control:

    - Earthworks are designed to minimize grading and control erosion, preserving the natural landscape.

    - Measures are implemented to reduce dust through dampening exposed soil.

4. Topsoil Management:

    - Removed topsoil is stockpiled and reused within the building zone. Stockpiles are watered regularly to maintain soil health.

5. Habitat Protection:

    - Existing vegetation is retained as long as possible to provide erosion control and protect biodiversity.

    - Sensitive habitats are identified and protected throughout construction.

6. Tree Removal and Selective Thinning:

    - Trees are only removed if approved and marked on plans. Specimen trees are fenced off and protected during construction.

LOOKING AHEAD

In 2025, we will enhance our tracking capabilities by utilizing ESRI's Survey 123 tool. This technology will enable us to monitor and report on our sustainable construction practices more effectively, ensuring continuous improvement in environmental stewardship and compliance with our sustainability goals.

Sustainable construction practices at Mbilu

KPI 2 | RESPONSIBLE PROCUREMENT

Indicator: Percentage of local or sustainably certified materials used in construction

Performance: Procurement prioritized FSC-certified, low-emission, recycled, and locally sourced materials within a 250 km radius.

Karingani implemented responsible procurement guidelines that prioritize both environmental integrity and community benefit. By sourcing building materials locally and using certified sustainable products, we reduced emissions from transport and supported regional economic development. These practices are embedded into the project design specifications and serve as a model for responsible infrastructure investment going forward.

SOCIAL CAPITAL RESULTS

Family from the Cubo Community

SOCIAL CAPITAL

SOCIAL EMPOWERMENT

KPI 1 | Community Infrastructure Development
AIM To improve access to essential services through investment in water and food processing infrastructure.

KPI 2 | Infrastructure Maintenance & Repairs
AIM To ensure the long-term functionality of community infrastructure through regular repairs and upgrades.

KPI 3 | Community Survey & Profiling
AIM To inform strategic planning through comprehensive data collection across neighbouring communities.

KPI 4 | Fisheries Development and Skills Transfer
AIM To support sustainable fisheries and community livelihoods at Massingir Dam.

KPI 5 | Youth Scholarship Program
AIM To build a skilled workforce through vocational training in tourism and wildlife tracking.

KPI 6 | Local Employment Creation
AIM To promote economic stability through inclusive employment and on-the-job skills development.

KPI 7 | Community Engagement & Conflict Resolution
AIM To strengthen relationships and resolve grievances through trust-based dialogue and collaboration.

KPI 8 | Human Resource - Health and Happiness
AIM To foster a healthy and inclusive workplace through training, infrastructure investment, and supportive policies.

KPI 9 | SMME Development & Local Procurement
AIM To strengthen local economies by supporting small businesses through responsible procurement.

KPI 10 | Local Economic Investment
AIM To ensure operational spending delivers measurable benefit to surrounding communities.
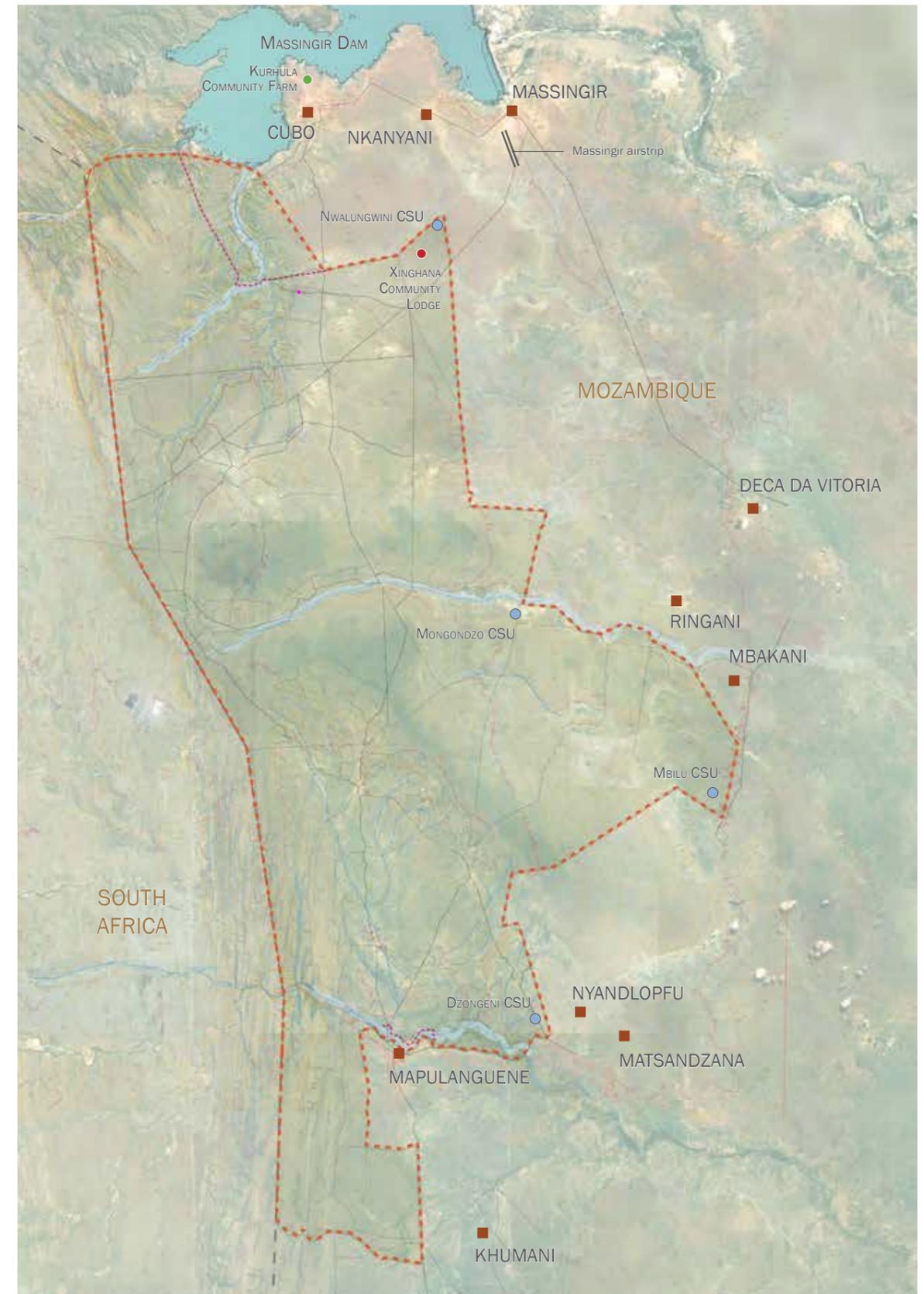
KPI 11 | Kurhula Farm Shop Accessibility Initiative
AIM To improve food access and farm sustainability through local produce sales in Massingir.

Community Plan Karingani's Immediate Neighbouring Communities

SOCIAL EMPOWERMENT
RESULTS

During the reporting period, Karingani focused on rebuilding harmonious relationships with neighboring communities through active engagement, listening to concerns, addressing complaints, and resolving legitimate issues. The strategy also prioritized sustainable community development, including supporting small and medium enterprises to provide long-term livelihoods. This was achieved not only by procuring local produce but also by building the capacity of local businesses. Through these efforts, Karingani remains committed to fostering lasting partnerships with neighboring communities, supporting their development, and respecting local traditions to ensure a prosperous future for all.

KPI 1 | COMMUNITY INFRASTRUCTURE DEVELOPMENT

OBJECTIVE

Improve access to essential services in surrounding communities through infrastructure investment. By prioritizing the development of water and food processing infrastructure, Karingani aims to support healthier, more resilient communities and demonstrate its commitment to meeting the everyday needs of its neighbors.

QUANTIFICATION

Three key projects were completed during the reporting period:

- A 500 kg/hour solar-powered electric maize mill was commissioned in Mapulanguene.
- A 5000L water tank system was installed in Nhandlopfu, benefiting 173 residents.
- A water tank stand was constructed in Mbacana, reaching 150 beneficiaries.

Electric maize mill

OUTCOME

Enhanced access to water and food processing capacity, with direct benefits for over 300 community members. The maize mill, powered by solar electricity, supports broader community access and food security.

SKILLS TRANSFER

Beneficiary training by equipment suppliers on use and maintenance of systems, including water pump repairs and operational troubleshooting. Drafted handover agreements define governance responsibilities.

KPI 2 | INFRASTRUCTURE MAINTENANCE & REPAIRS

Installation of a solar pump borehole

OBJECTIVE

Maintain functionality of community assets and promote sustainable system use. Through proactive repairs and upgrades, Karingani supports long-term infrastructure viability, ensuring community resources remain dependable and empowering communities with skills for local management.

QUANTIFICATION

- Reduction in maintenance requests from previous reporting periods
- Borehole in Mapulanguene Neighborhood 2 fitted with a solar pump.
- Water pipe system repaired in Neighborhood 1.

OUTCOME

Improved reliability of water access infrastructure, reduced downtime, and improved user confidence.

SKILLS TRANSFER

Community members trained during operational interventions; hands-on learning to address pump failures and maintenance best practices.

KPI 3 | COMMUNITY SURVEY & PROFILING

OBJECTIVE

Inform strategic development through comprehensive data collection and analysis. By understanding the real challenges and aspirations of surrounding communities, Karingani aims to tailor its interventions for maximum impact and ensure inclusive planning that reflects community voices.

QUANTIFICATION

230 households and **44** leaders surveyed across **10** communities.

OUTCOME

Established baseline community data used to guide future development strategies and engagement.

SKILLS TRANSFER

Not applicable in this phase (enumerator roles focused on data gathering).

KPI 4 | FISHERIES DEVELOPMENT AND SKILLS TRAINING

OBJECTIVE

Promote sustainable resource use and livelihood development around Massingir Dam. This initiative empowers local communities to steward natural resources effectively while gaining valuable technical skills and new income-generating opportunities.

QUANTIFICATION

- Community fisheries survey conducted.

6 local assistants trained in Canhane, Cubo, and Macavene.

OUTCOME

Data supports long-term fisheries management planning; engagement in Cubo increased through trust-building activities.

SKILLS TRANSFER

Research assistants trained as fisheries enumerators for long-term deployment.

KPI 5 | YOUTH SCHOLARSHIP PROGRAM

OBJECTIVE

Enhance employability of local youth through vocational education in tourism and tracking. This initiative builds a skilled workforce from within the community, offering life-changing opportunities and fostering future leaders in conservation and hospitality.

QUANTIFICATION

- $2 million program.

23 students graduated in 2024 - 15 female in hospitality and 8 males wildlife trackers (13 from Massingir).

OUTCOME

Graduates equipped for hospitality and eco-tourism employment; community and governmental recognition strengthened Karingani's social license.

SKILLS TRANSFER

Training through SACT and Tracker Academy covered hospitality, wildlife tracking, entrepreneurship, and culinary arts.

KPI 6 | LOCAL EMPLOYMENT CREATION

OBJECTIVE

Provide inclusive employment to reduce poverty and stimulate local economic growth. By offering stable jobs and skills development, Karingani contributes to financial independence and social upliftment in neighboring communities.

QUANTIFICATION

44 locals employed (**15%** women)

61.4% from Massingir

38.6% from Magude

OUTCOME

Stable incomes and practical work experience fostered social stability and skill development.

SKILLS TRANSFER

Job training, orientation, mentoring, and technical exposure in multiple trades.

KPI 7 | COMMUNITY ENGAGEMENT & CONFLICT RESOLUTION

OBJECTIVE

Foster mutual understanding and resolve community grievances. Karingani's engagement strategy builds bridges with stakeholders through open dialogue, trust-building, and active listening, laying a foundation for long-term collaboration.

QUANTIFICATION

• Exchange visit to Malilangwe Game Reserve.

• Multiple community-level engagements.

OUTCOME

Greater clarity on project goals among local leaders; decreased tensions; increased trust in processes.

SKILLS TRANSFER

Negotiation and engagement skills shared during visits; understanding of investment-community alignment.

KPI 8 | HUMAN RESOURCE - HEALTH AND HAPPINESS

Karingani recognises that staff well-being is central to its mission and long-term success. In 2024, the reserve initiated sustainability training for staff, equipping team members with new skills while fostering a sense of pride and shared purpose. This commitment to health and happiness was further demonstrated through investments in safe water infrastructure, upgraded staff accommodation, and supportive workplace policies. These efforts contribute to a positive and inclusive work environment, encouraging active engagement, professional growth, and overall well-being for all employees.

Kurhula Community Farm

KPI 9 | SMME DEVELOPMENT & LOCAL PROCUREMENT

OBJECTIVE

Stimulate local entrepreneurship through procurement and development support. By sourcing locally and supporting small businesses, Karingani strengthens local value chains and increases community resilience

QUANTIFICATION

- Contractors and transport providers hired from within the region.

OUTCOME

Boosted local business capacity; increased interest in education among youth aiming for scholarship programs.

SKILLS TRANSFER

Economic literacy and awareness of procurement processes; motivation for educational attainment.

KPI 10 | LOCAL ECONOMIC INVESTMENT

OBJECTIVE

Ensure local spending supports sustainable community economic development. Transparent expenditure fosters economic inclusion and ensures the reserve's operations positively impact local livelihoods.

QUANTIFICATION

STAFF FOOD SUPPORT ALLOWANCE PURCHASED LOCALLY BY KARINGANI

$256,588.50
(MZN 16,396,005.16)

GOODS AND SERVICES PURCHASED LOCALLY BY KARINGANI

Goods and services used for daily operations and maintenance include fuel, airtime, uniform repairs, casual labour, tyre repairs etc.

$46,071.40
(MZN 2,943,962.69)

BUILDING MATERIAL OBTAINED FROM LOCAL SUPPLIERS

$25,645.26
(MZN 1,638,732.41)

OUTCOME

Transparent local expenditure channels community development through consistent support of businesses and livelihoods.

SKILLS TRANSFER

Improved local economic awareness and capacity through procurement inclusion.

KPI 11 | KURHULA FARM SHOP ACCESSIBILITY INITIATIVE

OBJECTIVE

Increase access to fresh produce and income stability for farm operations. By connecting local farmers to consumers, the farm shop fosters food security, economic inclusion, and sustainability.

QUANTIFICATION

- Daily sales of seasonal produce in Massingir.

OUTCOME

Boosted local business capacity; increased interest in education among youth aiming for scholarship programs.

SKILLS TRANSFER

Economic literacy and awareness of procurement processes; motivation for educational attainment.

SUSTAINABLE DEVELOPMENT RESULTS

NODE A - AMAN

KPI 1 | Investment Funding

AIM To attract investor interest in the development nodes at Karingani, for the purposes of building and operating world-class hospitality projects.

KPI 2 | Land Use Rights Acquisition

AIM To ensure relevant approvals are attained from government authorities to allow for land usage rights for each development nodes.

KPI 3 | Brand Operator Diligence and Commitment

AIM To engage with Aman Hotels and Resorts to stress test the financial model, reach agreement on investment and operating terms, compliance to operator brand guidelines, deed of adherence to the constitution, acceptance of the sustainability guidelines and schedule for the development.

KPI 4 | Delivery

AIM Following operator and investor agreements, to reach a detailed design, costing and construction plan, for the timely delivery of the project, including the appointment of the conceptual design team and technical documentation team.

NODE F - ONE&ONLY

KPI 1 | Investment Funding

AIM To attract investor interest in the development nodes at Karingani, for the purposes of building and operating world-class hospitality projects.

KPI 2 | Land Use Rights Acquisition

AIM To ensure relevant approvals are attained from government authorities to allow for land usage rights for each development nodes.

KPI 3 | Brand Operator Diligence and Commitment

AIM To engage with One and Only Hotels to stress test the financial model, reach agreement on terms, compliance to operator brand guidelines, deed of adherence to the constitution, acceptance of the sustainability guidelines and schedule for the development.

KPI 4 | Delivery

AIM Following operator and founder agreements, to reach a detailed design, use of sustainable materials, procurement costing, construction plan, for the timely delivery of the project.

NODES B, C, D & E

KPI 1 | Investment Funding

AIM To attract investor interest in the development nodes at Karingani, for the purposes of building and operating world-class hospitality projects.

KPI 2 | Land Use Rights Acquisition

AIM To ensure relevant approvals are attained from government authorities to allow for land usage rights for each development nodes.

KPI 3 | Brand Operator Diligence and Commitment

AIM To engage with One and Only Hotels to stress test the financial model, reach agreement on terms and progress the project.

KPI 4 | Delivery

AIM Following operator and founder agreements, to reach a detailed design, use of sustainable materials, procurement costing, construction plan, for the timely delivery of the project.

MARKETING

KPI 1 | Globally Recognised Destination

AIM Position Karingani as a world class conservation and ecotourism destination.

KPI 2 | Global Market Awareness

AIM Utilise technology and third party promotion to maximize market awareness.

KPI 3 | Model Sustainable Development

AIM To be recognised as a market leader in responsible stewardship using natural and social capital KPIs.

BUSINESS PLAN

KPI 1 | Asset Management Plan

AIM Establish a development and business plan that accommodates for profit and not for profit activities focused on delivering a measurable positive impact for Karingani, manage and report.

KPI 2 | Levy Programme

AIM Create a conservation levy program to facilitate economic offsetting of the costs associated with the management and operation of Karingani.
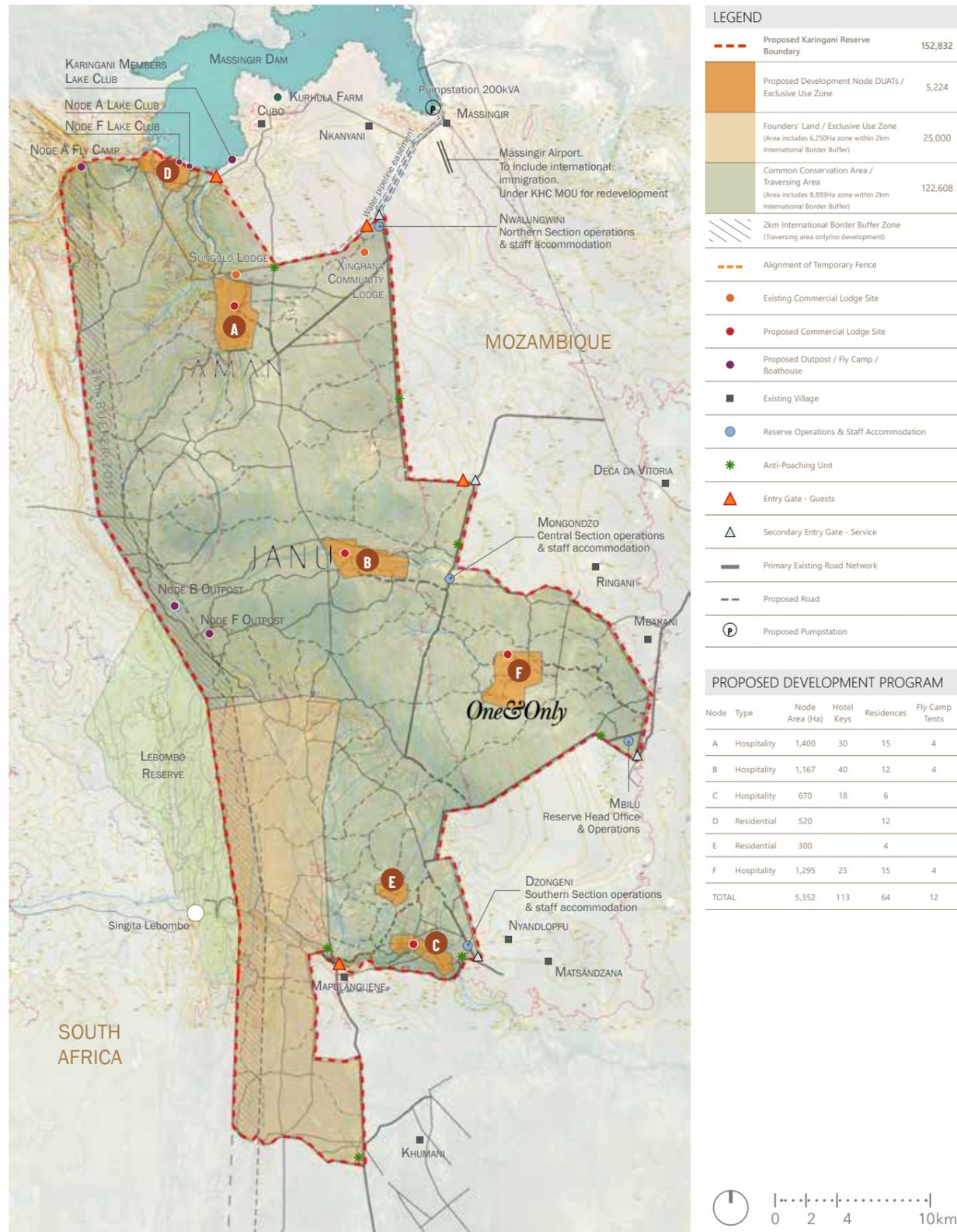
KPI 3 | Homeowners Association Constitution

AIM Provide long-term stewardship and value preservation of the asset with defined operational standards.

DEVELOPMENT PLAN

The Karingani planning and design team continue to update the Development Plan to respond to site conditions, management logistics, EIA, nodal deannexation, infrastructure planning and operator feedback.

LEGEND

⌐⌐⌐	Proposed Karingani Reserve Boundary	152,832
	Proposed Development Node DUATs / Exclusive Use Zone	5,224
	Founders' Land / Exclusive Use Zone (Area includes 6,250Ha zone within 2km International Border Buffer)	25,000
	Common Conservation Area / Traversing Area (Area includes 8,893Ha zone within 2km International Border Buffer)	122,608
/////	2km International Border Buffer Zone (Traversing area only/no development)	
– – –	Alignment of Temporary Fence	
●	Existing Commercial Lodge Site	
●	Proposed Commercial Lodge Site	
●	Proposed Outpost / Fly Camp / Boathouse	
■	Existing Village	
●	Reserve Operations & Staff Accommodation	
✳	Anti-Poaching Unit	
▲	Entry Gate - Guests	
△	Secondary Entry Gate - Service	
—	Primary Existing Road Network	
– –	Proposed Road	
Ⓟ	Proposed Pumpstation	

PROPOSED DEVELOPMENT PROGRAM

Node	Type	Node Area (Ha)	Hotel Keys	Residences	Fly Camp Tents
A	Hospitality	1,400	30	15	4
B	Hospitality	1,167	40	12	4
C	Hospitality	670	18	6	
D	Residential	520		12	
E	Residential	300		4	
F	Hospitality	1,295	25	15	4
TOTAL		5,352	113	64	12

NODE A - AMAN
RESULTS

KPI 1 | INVESTMENT FUNDING

Due Investment closed November 2022 including the signature of the Hotel Management Agreement and associated operating documents. Peak capital funding has been approved and contractor contractual bids are being sought.

KPI 2 | LAND USE RIGHTS ACQUISITION

A step plan for the transitional ownership of the Balule DUAT from the Karingani Founders to the incoming land investment and development group continues to be undertaken in alignment with the incoming investment group's due diligence for the Node A acquisition is in progress. The outcome will be an EIA that supports the de annexation of 1450ha in favor of the hotel investment group.

KPI 3 | BRAND OPERATOR DILIGENCE AND COMMITMENT

Aman proforma agreed as part of Hotel Management Agreement. Aman commitment to financial management contribution terms agreed. At time of closing the following documents were signed:

- Deed of Adherence to the Constitution
- Karingani Design and Sustainability Guidelines
- Operator Brand Guidelines for Karingani

KPI 4 | DELIVERY

Olson Kundig, Seattle selected as design architect and for interiors. Interviews for Lisbon-based technical documentation team to conclude in April 2023 for May 2023 appointments. Olson Kundig team visited time in January 2023 and a new site plan is expected in April 2023.

General contractor interviews taken place in Maputo, Mozambique and Lisbon, Portugal with a selection target date of May 2023.

Preliminary opening date scheduled for Q4 2027.

Sungulo Lodge was damaged in a cyclone and the decision taken to remove and rehabilitate the landscape.

BULK POWER AND WATER TO SUPPLY NODE A

Bulk water and power, and future-proofed fibre utilities are being delivered under a Promissory Agreement between TCE and the Node A investors Impact Preservation Partners (IPP). The EIA was approved in November 2022 and these utilities are due for commissioning in Q3 2023. Distribution licenses are under negotiation with ARA-Sul and EDM. This is phase 1 of TCE's water and power reticulation plan.

CONCEPTUAL BULK WATER NETWORK
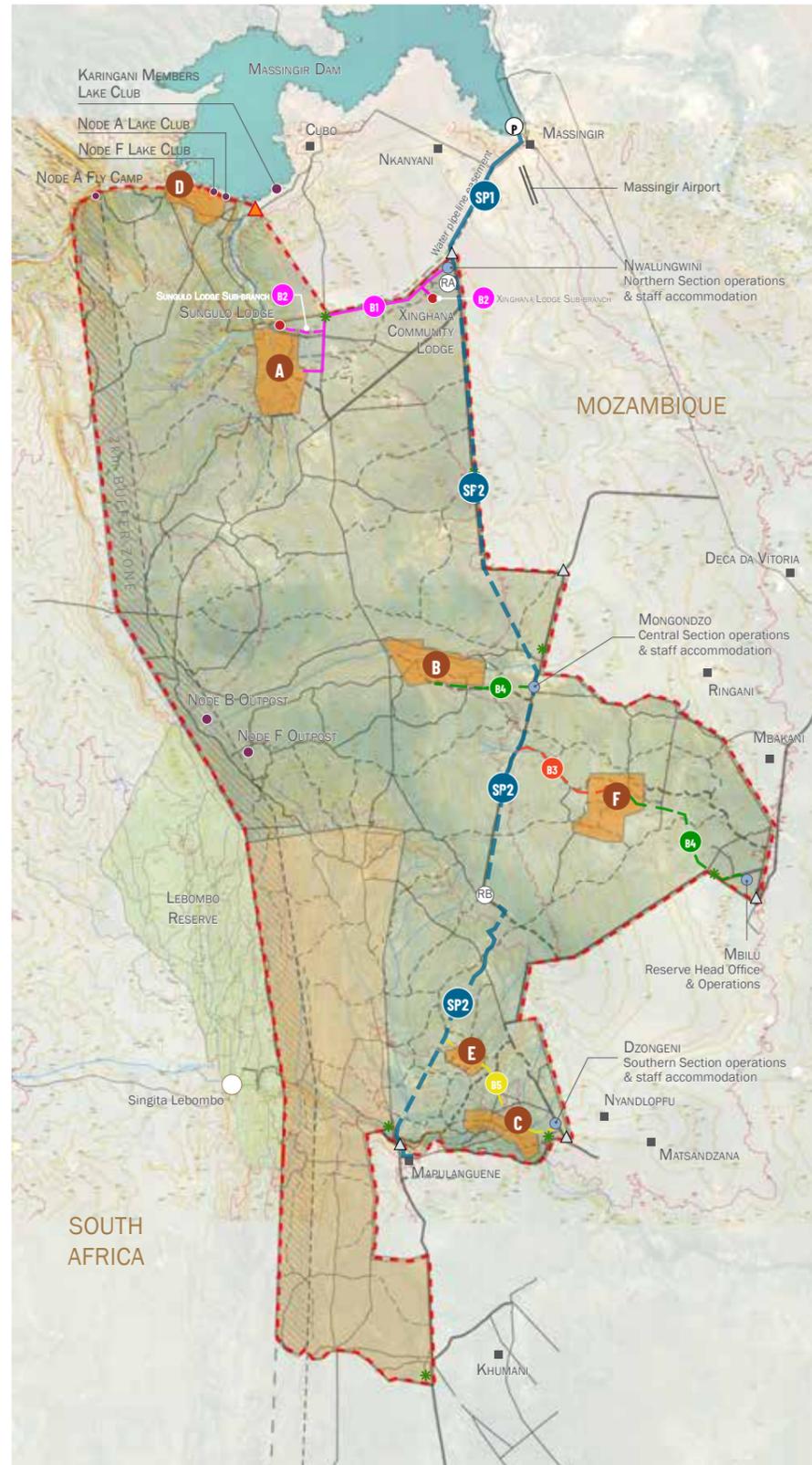
LEGEND - GENERAL

- ▬ ▬ Proposed Karingani Reserve Boundary
- Proposed Development Node DUATs / Exclusive Use Zone
- Founders' Land / Exclusive Use Zone
- 2km International Border Buffer Zone (Traversing area only/no development)
- ─ ─ Alignment of Temporary Fence
- ● Commercial Lodge Site
- ● Outpost / Camp
- ■ Existing Village
- ● Reserve Operations & Staff Accommodation
- ✳ Anti-Poaching Unit
- △ Entry Gate

LEGEND - WATER NETWORK

- Ⓟ Pumpstation at Massingir Dam
- ⓇA Reservoir A with Balancing Dam
- ⓇB Reservoir B
- ── Main Spine - Massingir Dam to Nwalungwini (Complete)
- ─ ─ Main Spine - Nwalungwini to Mapulanguene (Future)
- ── Node A & Xinghana Branch (Complete)
- ─ ─ Sungulo Branch (Future)
- ─ ─ Node F Branch (Future)
- ─ ─ Node B & Mbilu Branch (Future)
- ─ ─ Node E, C & Dzongeni Branch (Future)

TOURISM NODE HEADCOUNT

Node	Hotel Guests	Residence Guests	Staff
A	70	114	369
B	66	112	316
C	46	44	212
D	NA	NA	NA
E	NA	36	24
F	66	112	316

NOTE:
All infrastructure network alignments to be considered as indicative only and are subject to changed based on field verification, detailed design, changing site conditions and construction process.

All water infrastructure and reticulation inside Development Node to be designed and delivered by third party developers

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CONCEPTUAL BULK POWER NETWORK
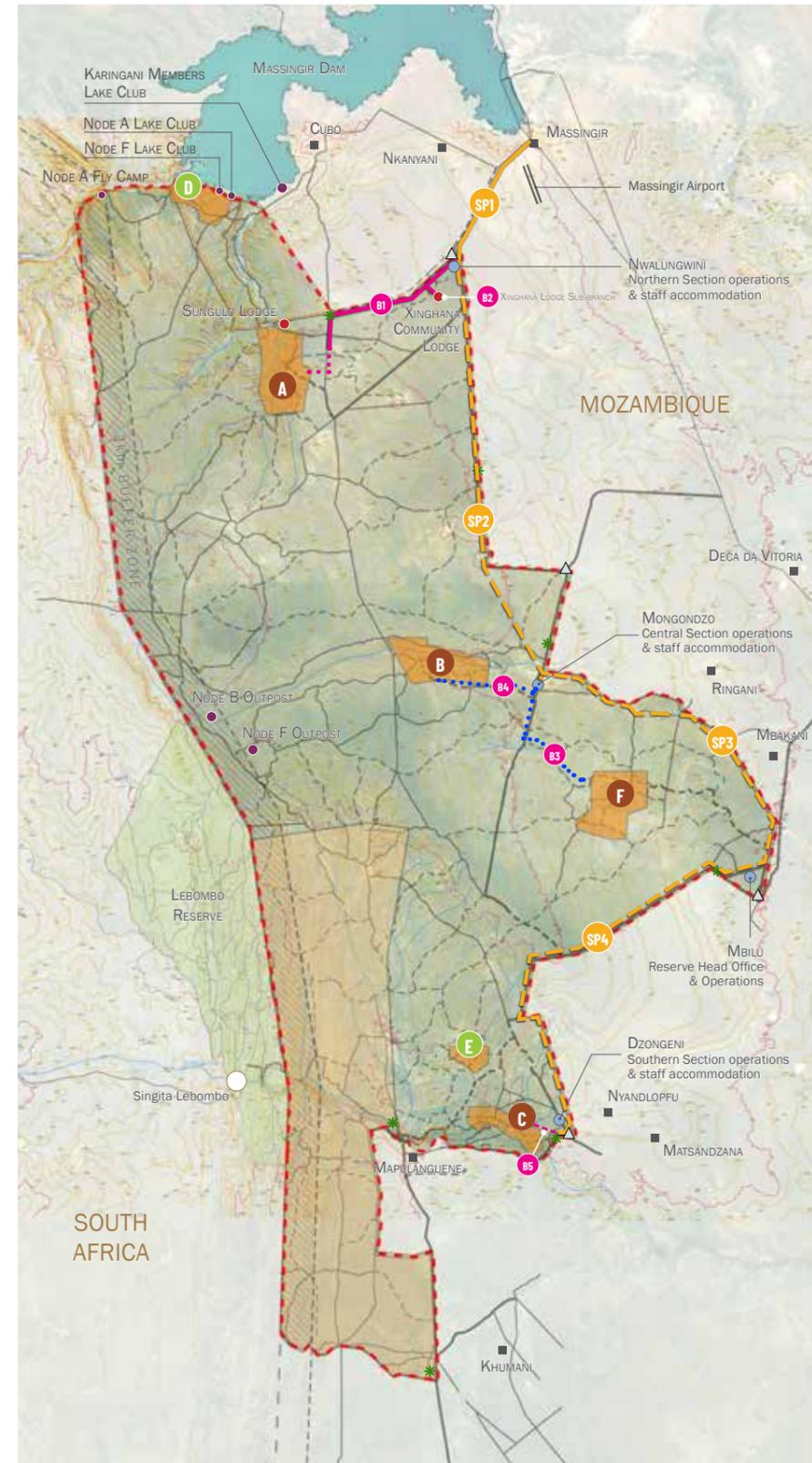
LEGEND - GENERAL

- ▬ ▬ Proposed Karingani Reserve Boundary
- Proposed Development Node DUATs / Exclusive Use Zone
- Founders' Land / Exclusive Use Zone
- 2km International Border Buffer Zone (Traversing area only/no development)
- ─ ─ Alignment of Temporary Fence
- ● Commercial Lodge Site
- ● Outpost / Camp
- ① Founder Lodge Site
- ■ Existing Village
- ● Reserve Operations & Staff Accommodation
- ✳ Anti-Poaching Unit
- △ Secondary Entry Gate - Service

LEGEND - POWER NETWORK

- ── Spine - 33kV Overhead Line (Complete)
- ─ ─ Spine - 33kV Overhead Line (Future)
- ── Branch - 33kV Overhead Line (Complete)
- ···· Branch - 33kV Underground Line (Complete)
- ···· Branch - 33kV Underground Line (Future)
- Ⓓ Development Node powered 100% by renewable energy at cost of incoming developer

TOURISM NODE HEADCOUNT

Node	Hotel Guests	Residence Guests	Staff
A	70	114	369
B	66	112	316
C	46	44	212
D	NA	NA	NA
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F	66	112	316

NOTE:
All infrastructure network alignments to be considered as indicative only and are subject to changed based on field verification, detailed design, changing site conditions and construction process.

All power infrastructure and reticulation inside Development Node to be designed and delivered by third party developers

BULK WATER AND POWER NETWORK

Water is currently supplied to the hotel site via a dedicated 23km pipe connection to Massingir Dam. It is expected that up to 100,000m3 per day will be consumed. Water will be treated at the hotel for safe human consumption. Grey wastewater will be treated on-site and reused for non-consumable purposes such as maintenance to reduce the amount of potable water required.

Energy is currently supplied to the hotel site from the national grid. Power is supplied from Massingir via a medium voltage 30kV overhead and underground cable, terminating in two 800kVA substations at the hotel. The monthly consumption is currently forecast at 400,000kWh/month, of which approximately 20% will be met through a dedicated on-site PV farm.
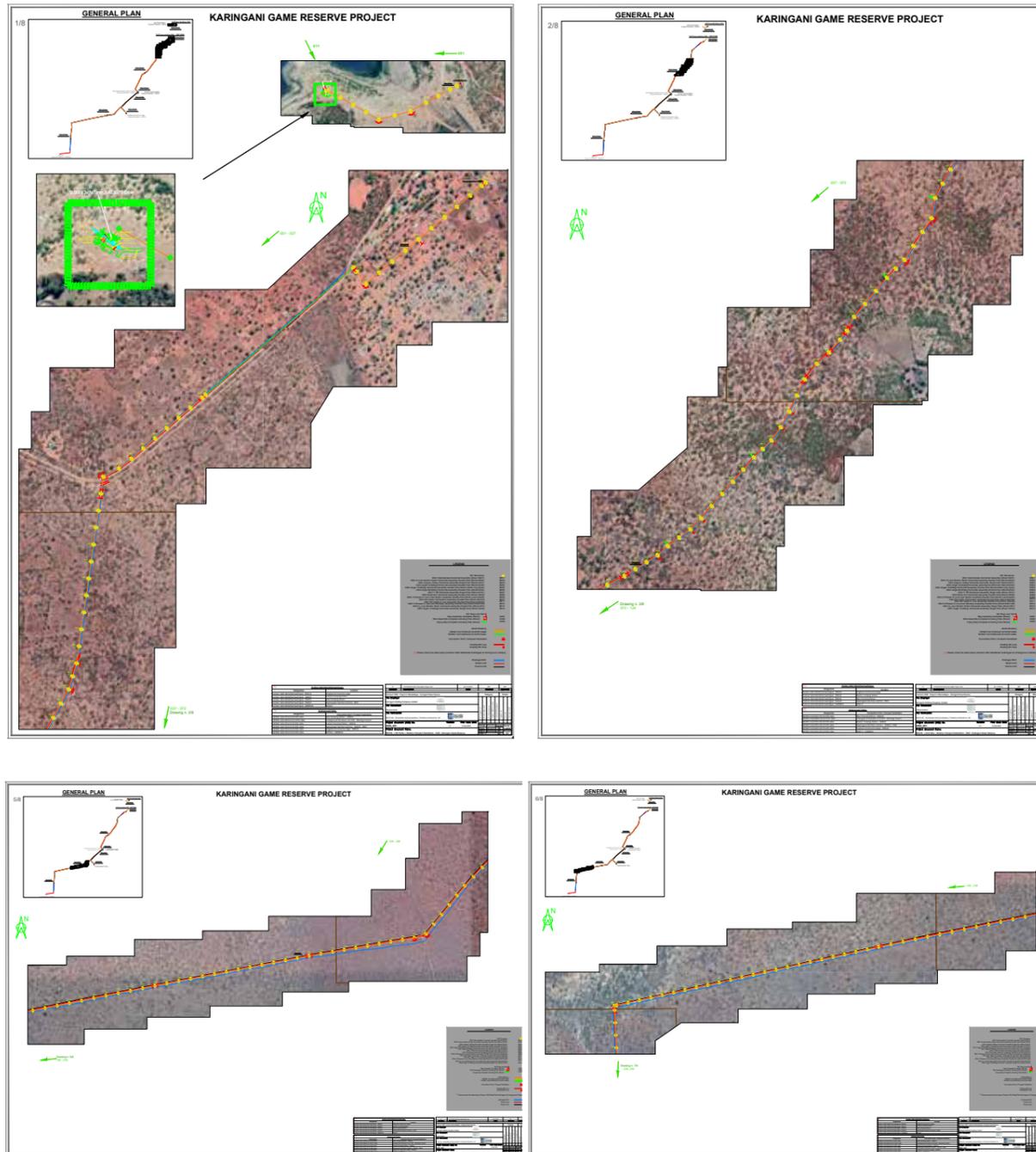
CASE STUDY: SUSTAINABILITY GUIDELINES

Karingani focused on transforming its sustainability vision into clear, actionable plans for infrastructure and building development—both within the Reserve and in the Nodes. While several strong documents already existed (e.g. Design and Sustainability Guidelines, Karingani Constitution, Community Development Strategy, and One Planet Ecosystems Plan), these lacked specific implementation guidance and measurable targets.

In response, Karingani developed a concise set of mandatory sustainability guidelines, created through close collaboration with the project team and aligned with global best practices. These include:

- Equitable Employment and SME Development Plan
- Responsible Procurement Management Plan
- Construction Waste Management Plan
- Erosion and Sedimentation Control Plan
- Sustainable Construction Management Guidelines
- Working in Karingani: Rules of Engagement

Each includes tracking and reporting requirements, is available on Karingani's Egnyte platform, and is integrated into the One Planet platform for monitoring and alignment with ecosystem outcomes.

As the Reserve enters full operations, Karingani is developing additional operational plans for waste management, responsible procurement, and asset maintenance—ensuring readiness, accountability, and long-term sustainability across all development.

BULK UTILITIES: POWER AND WATER

Reliable water and power networks are key to unlocking both tourism development and growth in the region. To facilitate the first phase of eco-tourism hotel development, 2024 saw the completion of a 10km power and water utility corridor connection the Reserve to the Massingir national energy grid and Massingir Dam, and a further 13km inside the reserve to supply Node A.

The project involved a complex stakeholder engagement and compensation process to define a route through adjacent community lands with as little environmental and social impact as possible.

The construction was managed in alignment with the approved EIA and Karingani's internal Environmental Management Plans with positive outcomes that included:

WASTE MANAGEMENT

- Minimal waste generated; mainly from bush clearing and packaging.
- ~20 tonnes of bush clearing waste reused or donated to the community.
- Reuse/recycling of pallets, cable reels, and cardboard.
- Non-reusable waste was responsibly disposed of in Maputo.

POLLUTION CONTROL

- Hazards from material handling and dust managed under the updated EMP.
- Erosion and sedimentation control implemented throughout construction.

BIODIVERSITY PROTECTION

- Sensitive species (e.g. Marula) marked and preserved; service routes adjusted.
- Wildlife protection protocols enforced on-site.

SUSTAINABLE & LOCAL SOURCING

- FSC-certified timber poles sourced from South Africa.
- Preference given to local suppliers for equipment, materials, and services.

EMPLOYMENT

- **Power project**: 51 jobs created, including 23 from local communities.
- **Water project**: 57 temporary jobs for residents of Cubo, Canhane, and Tihoveni.

TRAINING & AWARENESS

- Programs covered waste management, health and safety, hygiene, and conservation.
- HIV/AIDS awareness campaigns conducted.
- Environmental education extended to workers and local communities.
- Community conservation agreements signed, with training on participatory management.

COMMUNITY ENGAGEMENT

- Donated materials from site clearing provided practical benefits to local communities.
- Educational and conservation initiatives contributed to social well-being and strengthened local partnerships.

MBILU, NWALUNGWINI AND DZONGENI UPGRADES

With the approach of the first phase of tourism development, reserve-wide upgrades were to support infrastructure were delivered to:

- Improve accommodation standards for Karingani employees
- Expand staff housing for projected growth in staff population
- Deliver reliable water and power solutions to support operations
- Improve waste and sanitation services
- Upgrade facilities in remote scout pickets and security posts

Key metrics (need to get final stats from Joe)

- New buildings: 57
- Additional staff beds: 75
- Additional built area (m2): 3,500 m^2
- New boreholes: 4
- Solar upgrades: 270 kW

Expected for completion in July 2025, the sustainability plans were integrated into the design, specifications, and construction. Internal sustainability and Environmental Management Protocols were adhered to, with performance indicators monitored and reported across areas that included:

CONSTRUCTION MATERIALS

Sustainability drove material specifications throughout:

- **Low-emission materials** such as paints and sealants were sourced despite limited availability in Mozambique. Compliant products were identified and used, with procurement continuing as needed.
- **FSC-certified timber** was sourced through LevasFlor in Sofala Province following on-site due diligence. Other sustainable timber suppliers were also being assessed.
- **Sustainable sourcing practice**s prioritised reuse of materials (e.g. roof sheeting), local procurement (within 50–250km), and use of high-recycled-content materials to reduce embodied carbon.

LOCAL LABOUR

The programme generated jobs and training opportunities for local communities. Contractors tracked and submitted this data in monthly reports.

SUSTAINABLE CONSTRUCTION ACTIVITIES

Erosion control and protection of surrounding areas were implemented and documented.

SUSTAINABLE CONSTRUCTION ACTIVITIES

Erosion control and protection of surrounding areas were implemented and documented.

WATER MANAGEMENT

Existing water systems faced challenges due to high salinity and limited rainwater capture. A new integrated reticulation system was designed to improve supply, quality, stormwater, and wastewater management.

Key achievements included:

- 2 new boreholes were drilled at Mbilu.
- A comprehensive water balance and demand model was completed.
- Future greywater treatment was included in engineering plans.

POWER

A power demand model was developed to inform the Mbilu energy strategy. 270kW of renewable energy capacity was added to Mbilu through 2 solar farms.

ENVIRONMENTAL LICENSING

Karingani worked with EIA consultants to obtain an addendum to the existing environmental licence, covering construction and waste management. Karingani's high sustainability standards supported a streamlined process.

METERING AND IOT

Terms of Reference for IoT-enabled metering of power, water, and other indicators were developed. The system was designed to integrate with ESRI and the existing LoRa network. Proposals were received and under review.

WASTE MANAGEMENT

With internal development accelerating, Karingani developed and began implementing a comprehensive waste management plan aimed at achieving zero landfill, covering construction, domestic, and maintenance waste.

Key components included:

- **Construction Waste:** Waste stream audits were conducted and a sorting area was established. Processing and business development opportunities were being explored.
- **Domestic Waste:** A waste audit was conducted.
- **Central Waste Facility:** A new central waste hub was identified for Mbilu, with similar models planned for NSU and SSU.
- **Future Processing:** Options were to be explored in collaboration with local institutions and national waste management partners.
- **Education Programme:** A waste awareness and training initiative was launched and was being implemented across the Reserve.

NODE F – ONE&ONLY
RESULTS

KPI 1 | INVESTMENT FUNDING

Hotel Management Agreement signed in November 2022 with One&Only, long stop funding date Nov 1, 2025.

KPI 2 | LAND USE RIGHTS ACQUISITION

A similar step plan to the Node A investment, DUAT land use rights consolidation and de annexation is being procured in 2023/4 to allow for a land use transfer plan to be developed for Node B. Node B boundaries were adjusted based on technical input from One&Only masterplanning team.

KPI 3 | BRAND OPERATOR DILIGENCE AND COMMITMENT

One&Only proforma agreed as part of Hotel Management Agreement. At time of closing the following documents were signed:

• Deed of Adherence to the Constitution

• Karingani Design and Sustainability Guidelines

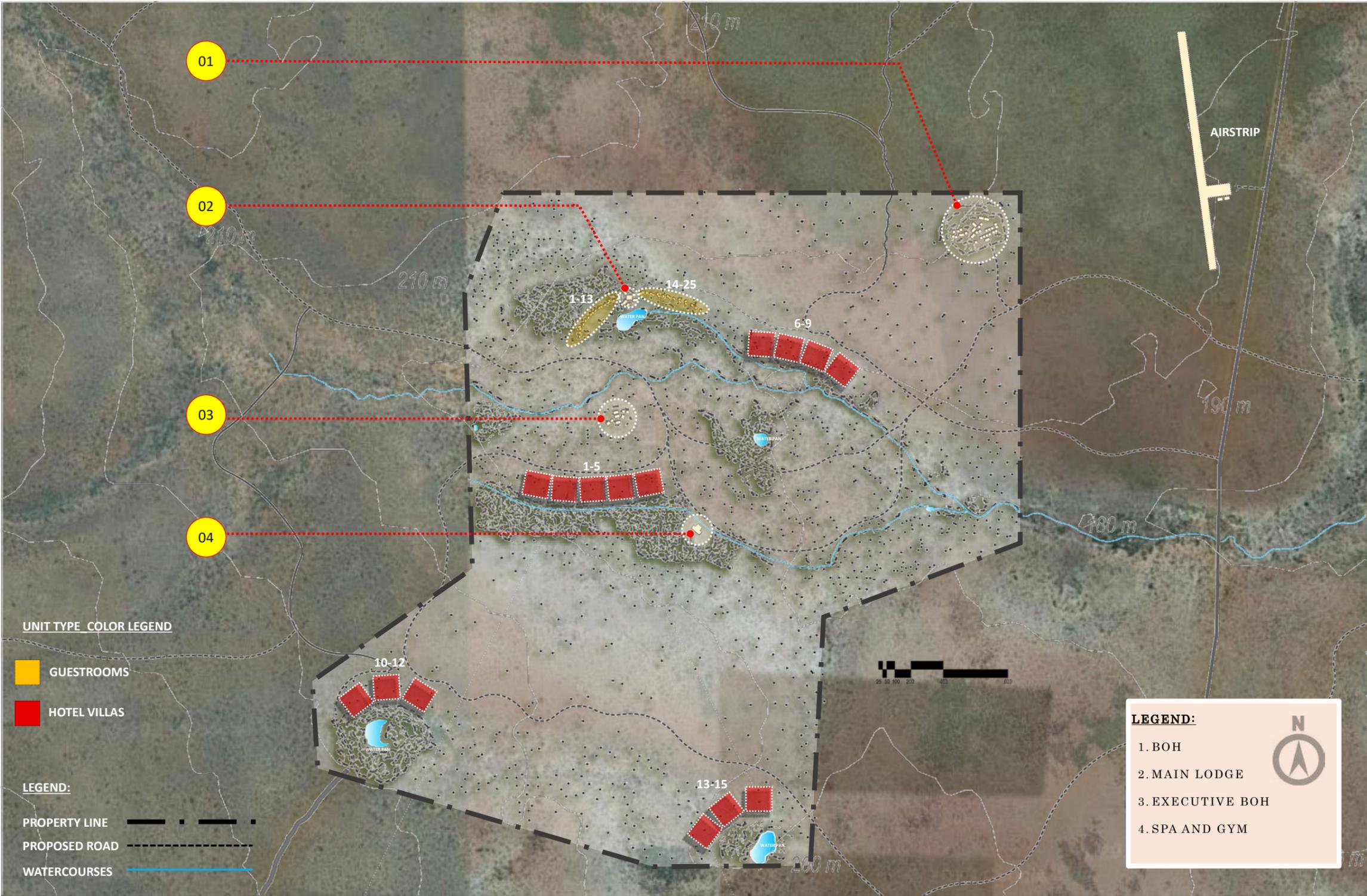• Operator Brand Guidelines for Karingani

KPI 4 | DELIVERY

Preliminary opening date mid-2029. Formalization will be subject to completion investment funding close. The professional team are yet to be selected and will be shortlisted in the forthcoming reporting period.

Game paths leading to natural pan within the Node F site at Karingani

MASTERPLAN

AIRSTRIP

01
02
03
04

14-25
1-13
6-9
1-5
10-12
13-15

UNIT TYPE_COLOR LEGEND

■ GUESTROOMS

■ HOTEL VILLAS

LEGEND:

PROPERTY LINE

PROPOSED ROAD

WATERCOURSES

LEGEND:

1. BOH
2. MAIN LODGE
3. EXECUTIVE BOH
4. SPA AND GYM

N

NODES B, C, D & E
RESULTS

KPI 1 | INVESTMENT FUNDING

Ongoing marketing to interested parties is taking place. The Founders' strategy is to create the market with Nodes A & B investment. Janu, owned by Aman, have expressed interest in developing a term sheet for Node F.

KPI 2 | LAND USE RIGHTS ACQUISITION

These nodes will benefit from the overall DUAT Land Rights Consolidation, which will then allow for De-annexisation of individual villa sites within the each of the hospitality development nodes.

KPI 3 | BRAND OPERATOR DILIGENCE AND COMMITMENT

It is anticipated at the time of closing with operators for these nodes, the same suite of documents signed by Nodes A & F would apply, including:

• Deed of Adherence to the Constitution

• Karingani Design and Sustainability Guidelines

• Operator Brand Guidelines for Karingani

KPI 4 | DELIVERY

Node F will be the next development node to proceed.

Opening dates for Nodes B, C, D, & E are as follows per the Karingani Business Plan

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Opening dates for Nodes B, C, D, & E are as follows per the Karingani Business Plan
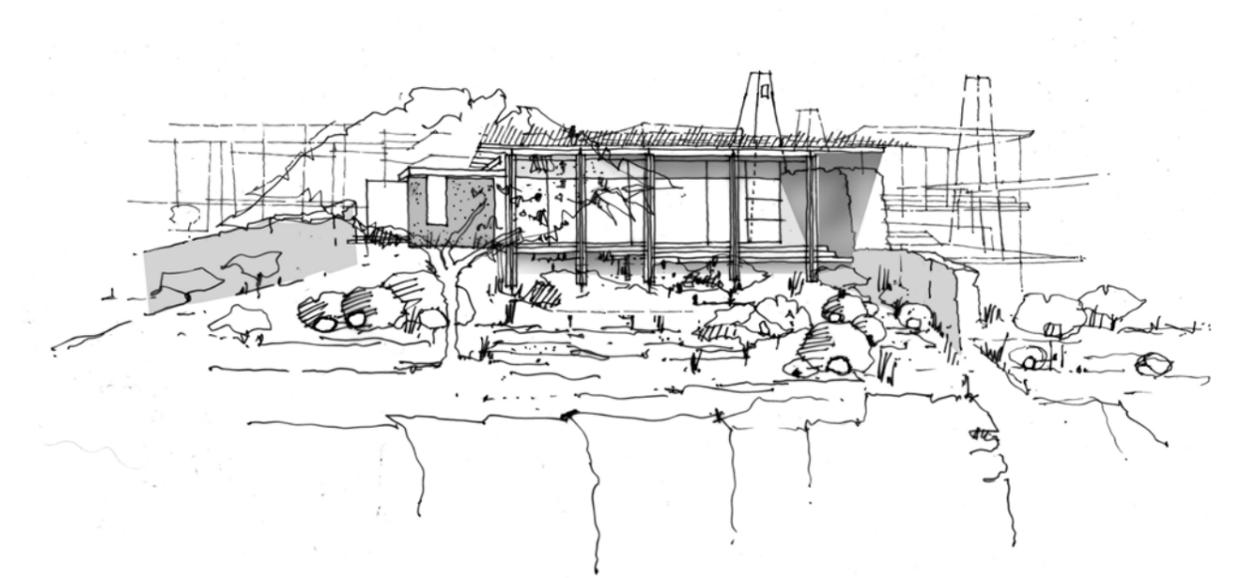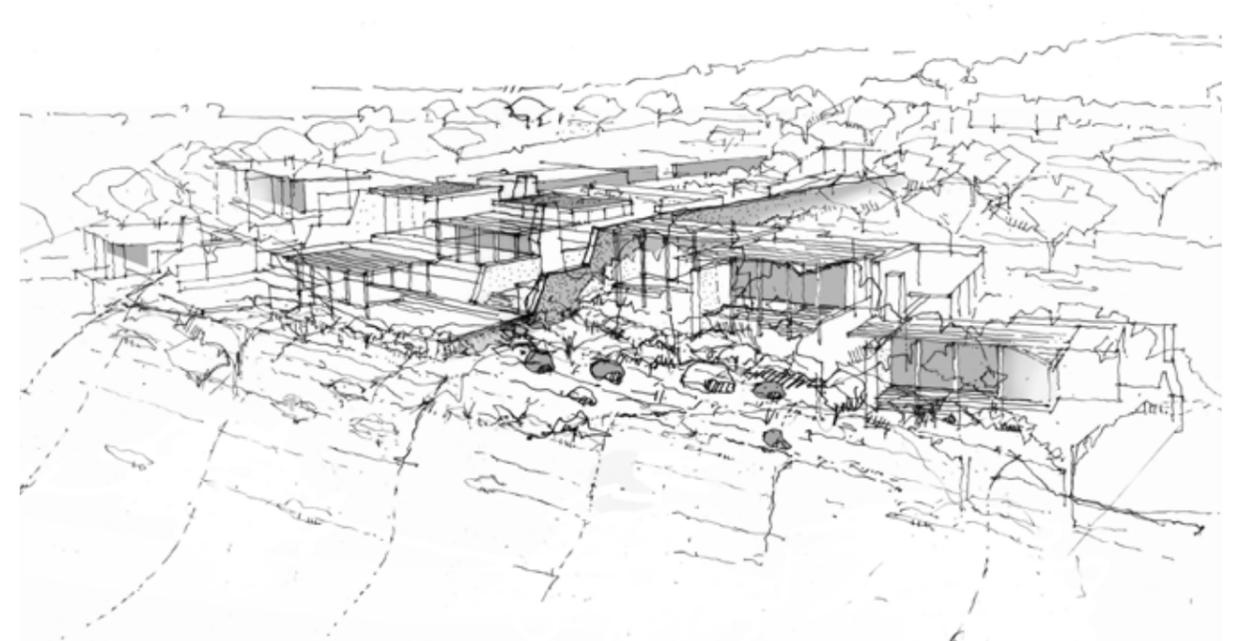
Node F – 2027

Node D – 2027

Node B – 2028

Node C – 2028

Node D – 2029

Additional Node - 2031

Sketches from the Design and Sustainability Guidelines setting building massing and scale for the tourism development nodes

MARKETING
RESULTS

KPI 1 | GLOBALLY RECOGNISED DESTINATION

Whilst two world class hospitality brands have signed management contracts to operate in Karingani, the marketing team continue to develop messaging and narratives to position Karingani as a best-in-class land rehabilitation, conservation management and tourism destination. An integral part of the Karingani market positioning is a focus on sustainable development and community partnerships.

It is anticipated that the operating brands of Aman and One&Only will add significant value in helping position Karingani as a premium nature-based tourism destination.

KPI 2 | GLOBAL MARKET AWARENESS

We are engaged with various foundations and NGO organisations as described in Chapter 1. These ongoing relationships provide Karingani with a platform to share lessons learned and engage in open dialogue with the conservation community for the purposes of expanding our global messaging.

WEBSITE

The existing website is being redeveloped in alignment with the master Brand Guidelines, expected to be launched in Q2 2023.

PRESS AND SOCIAL MEDIA

The reporting period marked a significant increase in media outreach and audiovisual content production. A total of 12 press releases were issued, resulting in over 160 media features, including newspaper articles, television, and radio coverage. The estimated audience reach exceeded 20 million people.

A key media highlight was the graduation ceremony of the South African College of Tourism (SACT) students, which generated 23 media pieces, including print and broadcast coverage.

Karingani also produced nine videos capturing key milestones and activities across the reserve. These included the partnership with SACT, World Rangers Day celebrations, the opening of Xinghana Lodge, Mapulanguene Day, the Tilapia Festival, initiatives with the Cubo community, and various conservation efforts.

These activities collectively contributed to strengthening the visibility and reputation of Karingani Game Reserve as a leading conservation and community development initiative in southern Mozambique.

MEDIA KITS

Following on from the Brand Guidelines and website relaunch, media kits will be prepared for distribution to the hospitality operating brands under agreement with these brands to use a Karingani-produced narrative within their marketing campaigns.

KPI 3 | MODEL SUSTAINABLE DEVELOPMENT

Karingani recognises that staff well-being is central to its mission and long-term success. In 2024, the reserve initiated sustainability training for staff, equipping team members with new skills while fostering a sense of pride and shared purpose. This commitment to health and happiness was further demonstrated through investments in safe water infrastructure, upgraded staff accommodation, and supportive workplace policies. These efforts contribute to a positive and inclusive work environment, encouraging active engagement, professional growth, and overall well-being for all employees.

BUSINESS PLAN
RESULTS

KPI 1 | ASSET MANAGEMENT PLAN

The following eight operating department Pillars structured around fit-for-purpose roles and responsibilities, and in alignment with a new accounting package, were approved by the Karingani Partners as the baseline organizational structure for fiscal and operational management and reporting.

- Asset management
- Ecotourism development
- Regional development
- Government and Regulatory
- Communities
- Protected Area management
- Conservation
- Impact

The following meeting schedule is in place:

- Weekly Team Meetings
- Weekly transaction Meetings
- Quarterly Board Meetings
- Quarterly Forecast Meetings
- Annual Budget Meeting
- Annual Biodiversity/ PRI Meeting
- Annual Strategic Plan Meeting

KPI 2 | LEVY PROGRAMME

A conservation levy program has been formulated and adopted and will be applied to help offset operational costs of bulk utilities,land stewardship and conservation efforts at Karingani. These levy programmes have been accepted within the management contract agreements with Nodes A and B.

Two forms of levies apply:

a.   hotel operations, and

b.   individual villa owners

These levies include a dedicated payment for conservation management. The detailed deliverables provided by Karingani to nodal investors are outlined in the Field Management Guide attached to the Deed of Adherence to the Karingani Constitution. In addition a utilities tariff program has been developed for power and water.

KPI 3 | HOMEOWNERS ASSOCIATION CONSTITUTION

The Karingani Constitution was redrafted for the Founding Partners' new shareholders agreement and the investment / operating parties for Nodes A and F at the time of concluding management agreement signature agreed to a Deed of Adherence to this constitution. The constitution contents and annexures are listed below:

CONTENTS:

- Interpretation
- Introduction
- Undertaking
- Promulgation as Game Reserve
- Conditions Precedent
- Custodian's Role, Objectives and Aims
- Duration
- Entrenched Rights of the Custodian
- Rights in Respect of the Development Nodes
- Construction Obligations
- General Management, Conservation and Fundraising for Conservation
- Roads
- Traversing Rights
- Homeowners Associations
- Villa Ownership and Ultimate Beneficial Ownership
- Acquisition and Alienation Commercial Rights
- Change of Control of a Juristic Person which is an Interested Party
- Pre-Emptive Rights
- Discipline
- Levies
- Interested Parties Risk, Indemnity and Limitation of Liability
- Use of the Massingir Dam
- Massingir Airport
- Rental Programme
- Design and Sustainability Guidelines
- Annual Property Report
- Branding and Branding Guidelines
- Communications
- Medical Readiness
- Non-Solicitation
- Breach
- Confidentiality
- Co-operation
- Independent Advice
- Dispute Resolution
- Amendments to this Agreement
- Notices and Domicilia
- Assignment
- Supersession
- Warranty of Authority
- Severability
- No Waiver
- Whole Agreement
- Counterparts
- Costs

ANNEXURES:

A - Karingani Game Reserve: Map

B – Design and Sustainability Guidelines

C – FOM

D – Deed of Adherence

E – Brand Governance Document

F – Organisational Chart

G – Roads

H – Trademarks

I – Reserve Wide Communications Network – Technical Detail and Specifications

Giraffe at Impala Pan in Karingani

CREDITS

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