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The deployment of EarthRanger, a data visualization and analysis software to strengthen Protected Area Management Effectiveness in Africa's National Parks.

Part I: Project Information

GEF ID
10551

Project Type
FSP

Type of Trust Fund
GET

CBIT/NGI
☐ CBIT
☐ NGI

Project Title
The deployment of EarthRanger, a data visualization and analysis software to strengthen Protected Area Management Effectiveness in Africa's National Parks.

Countries
Regional, Botswana, Congo, Mozambique

Agency(ies)
CI

Other Executing Partner(s)   **Executing Partner Type**

Vulcan Inc. The Botswana Department of Wildlife and National Parks; The
Mozambique National Sustainable Development Fund (FNDS) and; The Republic of   Others
Congo Ministry of Tourism and Environment

GEF Focal Area
Biodiversity

Taxonomy
Knowledge Generation, Training, Workshop, Capacity, Knowledge and Research, Focal Areas, Biodiversity, Protected Areas and Landscapes, Terrestrial Protected Areas, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approache, Stakeholders, Private Sector, SMEs, Beneficiaries, Civil Society, Community Based Organization, Non-Governmental Organization, Local Communities, Communications, Awareness Raising, Type of Engagement, Partnership, Consultation, Participation, Gender Equality, Gender results areas, Capacity Development, Gender Mainstreaming, Learning, Adaptive management, Indicators to measure change, Innovation

Rio Markers
Climate Change Mitigation
Climate Change Mitigation 0

Climate Change Adaptation
Climate Change Adaptation 0

Duration
45 In Months

Agency Fee($)
216,609

Submission Date
3/23/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount($)	Co-Fin Amount($)
BD-2-7	GET	2,407,360	2,527,500
	Total Project Cost ($)	2,407,360	2,527,500

B. Indicative Project description summary

Project Objective

To strengthen management effectiveness of priority Protected Areas (PAs) in Africa to deliver Global Environmental Benefits through deployment of the EarthRanger Protected Area Management system and related technologies.

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount($)	Co-Fin Amount($)
COMPONENT 1: Installation of Earth Ranger software together with other required technologies and infrastructure to achieve Earth Ranger readiness	Investment	**Outcome 1.1:** Strengthened institutional and technical capacity of participating countries to effectively manage protected areas _Outcome Indicator 1.1.1:_ Hectares of protected areas with improved METT[1] score _Target:_ · At least 2,115,200 hectares of protected areas with improved METT scores _(hectares, baseline and target METT scores TBD in the PPG phase)_	**Output 1.1.1:** Earth Ranger software incorporated in the existing PA management structure in the target countries _Indicator 1.1.1:_ Number of PAs utilizing Earth Ranger technology to manage the PAs _Target:_ At-least 2 PAs per country utilizing Earth Ranger technology to manage the PAs **Output 1.1.2:** A dedicated, secure and functional control room facility established to be used by management to improve real-time situational awareness	GET	2,002,724	2,276,125

through deployment of Earth Ranger technology in each PA in the target countries

Indicator 1.1.2:

Number of functional control rooms running on Earth Ranger software and equipped with reliable power and internet connection together with the required computer hardware.

Target:

·   At least 2 protected areas in each target country with fully equipped control room running Earth Ranger software

Output 1.1.3:

Required built infrastructure and internet backhaul capabilities installed in at least two protected areas in each target country

Indicator 1.1.3:

[1] Management Effectiveness Tracking Tool (METT) for GEF-7 Protected Area Projects in the Biodiversity Focal Area can be accessed by clicking the following link:

https://www.thegef.org/documents/gef-7-biodiversity-protected-area-tracking-tool

Number of PAs with built
infrastructure and internet
backhaul capabilities
installed and functional.

Target:

·　　　Built infrastructure
and internet backhaul
capabilities installed and
functional in at least two
PAs in each target country

Output 1.1.4

Digital radio or other
appropriate
communications network
as appropriate for the
context installed and
functional in each of the
selected protected areas
in the target countries.

Indicator 1.1.4:

Number of PAs with digital
radio or other appropriate
communications enabled
and functional (Repeater
stations, base stations,
vehicle radios and hand
held radios)

Target:

·   At least 2 PAs in each target country with digital radio or other appropriate communications installed and functional

Output 1.1.5:

LoRa networks installed as required to provide connectivity from the field to the control room *(LoRa networks will be installed where a selected protected areas do not have GSM coverage, a low bandwidth)*

Indicator 1.1.5:

Number of PAs with connectivity due to installation of LoRa networks *(LoRa networks will be installed where a selected protected areas do not have GSM coverage, a low bandwidth)*

Target:

Atleast 1 PA per country connected due to installation of LoRa networks.

Output 1.1.6: Protected area management staff trained to utilize Earth Ranger software (sensors, radios, satellite collars and other data transmitters)

Indicator 1.1.6:

Number of field staff in each PA utilizing Earth Ranger software for various purposes (sensors, radios, satellite collars and other data transmitters)

Target:

·   At least 2 management staff and 3 control room staff per protected area are trained on Earth Ranger and associated technologies (sensors, radios, satellite collars and other data transmitters)

·   Number of field staff in each PA with reliable voice communications and real-time SOS capability *(number will be determined during PPG)*

COMPONENT 2: Learning and knowledge sharing on the Earth Ranger technology	Technical Assistance	**Outcome 2.1:** Additional countries interested and committed to install Earth Ranger technology	**Output 2.1.1:** Learning site visit (exposure trip) undertaken by other African countries to at least 1 PA	GET	210,380	125,000

Outcome 2.1:

Additional countries interested and committed to install Earth Ranger technology

Outcome Indicator 2.1.1:

Number of additional countries committed (GEF8 LoEs, Cofinancing pledges)

to install the Earth Ranger project

Target:

At-least 3 additional countries committed to install Earth Ranger Technology

Output 2.1.1:

Learning site visit (exposure trip) undertaken by other African countries to at least 1 PA

Indicator 2.1.1: Number of learning site visits undertaken by other countries to a PA

Target:

·   Atleast 1 learning site visit undertaken by other African countries to atleast 1 PA

Output 2.1.2:

Success stories published on blogs, websites etc

(where the Earth Ranger software informed decisions in management of PAs)

Indicator 2.1.2:

Number of success stories published on blogs, websites *(where the Earth Ranger software informed decisions in management of PAs)*

Target:

·   Atleast 2 success
stories shared annually

M&E	Technical Assistance		GET	79,620	
		Sub Total ($)		2,292,724	2,401,125

Project Management Cost (PMC)

			GET	114,636	126,375
		Sub Total($)		114,636	126,375
		Total Project Cost($)		2,407,360	2,527,500

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Private Sector	Vulcan	Grant	Investment mobilized	2,000,000
Government	The Botswana Ministry of Environment, Wildlife and Tourism (Department of Wildlife and National Parks)	Grant	Investment mobilized	300,000
GEF Agency	Conservation International	Grant	Investment mobilized	25,000
Private Sector	Vulcan	In-kind	Recurrent expenditures	202,500
			Total Project Cost($)	2,527,500

Describe how any "Investment Mobilized" was identified

NOTE: -During PPG Phase, we will identify in-kind and cash co-financing that will come from each PA where we will work, but those PAs will be determined in the PPG phase. -Recipient Country Governments (PA Authorities): In-kind co-financing that will come from each PA where we will work, but those PAs will be determined in the PPG phase. -Recipient Country Governments (PA Authorities): Cash co-financing that will come from each PA where we will work, but those PAs will be determined in the PPG phase.

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
CI	GET	Regional	Biodiversity	BD Global/Regional Set-Aside	1,344,202	120,978	1,465,180
CI	GET	Botswana	Biodiversity	BD STAR Allocation	616,442	55,427	671,869
CI	GET	Congo	Biodiversity	BD STAR Allocation	446,716	40,204	486,920
				Total GEF Resources($)	2,407,360	216,609	2,623,969

E. Project Preparation Grant (PPG)

PPG Required ☑

PPG Amount ($)	PPG Agency Fee ($)
69,705	6,273

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount($)	Fee($)	Total($)
CI	GET	Regional	Biodiversity	BD Global/Regional Set-Aside	31,945	2,875	**34,820**
CI	GET	Botswana	Biodiversity	BD STAR Allocation	25,760	2,318	**28,078**
CI	GET	Congo	Biodiversity	BD STAR Allocation	12,000	1,080	**13,080**
				Total Project Costs($)	**69,705**	**6,273**	**75,978**

Core Indicators

Indicator 1 Terrestrial protected areas created or under improved management for conservation and sustainable use

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
2,115,200.00	0.00	0.00	0.00

Indicator 1.1 Terrestrial Protected Areas Newly created

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Indicator 1.2 Terrestrial Protected Areas Under improved Management effectiveness

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
2,115,200.00	0.00	0.00	0.00

Name of the Protected Area	WDPA ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)	
Gorongosa	801		369,300.00							🗑
Makgadikgadi Pans	1224	Wilderness Area	490,200.00							🗑
Marromeu	4649		155,900.00							🗑
Nouabalé-Ndoki	72332	National Park	415,000.00							🗑
Ntokou-Pikounda	354010		427,200.00							🗑

| Nxai Pan | 601 | Wilderness Area | 257,600.00 | 🗑 |

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

At-least 2,115,200 Ha of protected areas with improved METT scores (hectares, baseline and target METT scores TBD in the PPG phase) This is a list of tentative PAs. Together with the governments the final PAs (two per country) will be identified during the PPG phase on the basis of a set of criteria. The criteria for selecting the PAs during the PPG Phase are given above. The minimum number of hectares with improved management effectiveness that would be achieved by deploying Earth Ranger in two PAs in each country from the list of tentative PAs would be 2,115,200 ha (if the smallest PAs would be chosen).

Part II. Project Justification

1a. Project Description

<u>Protected Area profile per country:</u>

Tentative list of potential target Protected Areas for Earth Ranger deployment:

1. Table 2, 3 and 4 provide the tentative list of potential target Protected Areas (PAs) for Earth Ranger deployment in Botswana, Republic of Congo and Mozambique respectively. We will work with the host governments to identify the final PAs and we are open to recommendations outside the pre-selected potential areas as long as they meet the required criteria.

2. Botswana: Table 2 provides the tentative list of potential target Protected Areas for Earth Ranger deployment in Botswana.

Table 2: Earth Ranger Target Protected Areas-Botswana

Name of Target Protected Areas for Earth Ranger deployment – Botswana		Hectares (Ha)	WDPA ID	IUCN CATEGORY[1]
National Park	1. Gemsbok (Botswana portion of the Kgalagadi TFCA)	2,631,000	7508	IB: Wilderness Area
	2. Chobe	1,100,000	600	IB: Wilderness Area
	3. Nxai Pan	257,600	601	IB: Wilderness Area
	4. Makgadikgadi Pans	490,200	1224	IB: Wilderness Area
	Sub-Total (Ha)	*4,478,800*		
Game Reserve	5. Central Kalahari	5,280,000	7510	IB: Wilderness Area
	Sub-Total (Ha)	*5,280,000*		
Ramsar Site, Wetland of International Importance	6. Okavango Delta System (including Moremi Game Reserve and the World Heritage Site)	5,537,400	145516	Not Applicable
	Sub-Total (Ha)	5,537,400		
	TOTAL AREA (Ha)	15,296,200		

[1] IUCN. (2020). Protected Areas: IUCN Management Categories. Retrieved April 2020, from IUCN: https://www.iucn.org/theme/protected-areas/about/protected-areas-categories/category-vi-protected-area-sustainable-use-natural-resources

3. **Republic of Congo (RoC):** Table 3 provides the tentative list of potential target Protected Areas for Earth Ranger deployment in the Republic of Congo.

Table 3: Earth Ranger Target Protected Areas - Republic of Congo (RoC)

Name of Target Protected Areas for Earth Ranger deployment – Republic of Congo (RoC)		Hectares (Ha)	WDPA ID	IUCN CATEGORY
National Park	1. Nouabalé-Ndoki	415,000	72332	II: National Park
	2. Odzala Kokoua	1,354,600	643	II: National Park
	3. Conkouati-Douli	504,950	313401	II: National Park
Community Reserve	4. Lac Télé	438,960	313494	IV: Habitat/Species Management Area
National Park	5. Ntokou-Pikounda	427,200	354010	Not reported
TOTAL AREA (Ha)		3,140,710		

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7. **Mozambique:** Table 10 provides the tentative list of potential target Protected Areas for Earth Ranger deployment in Mozambique.

Table 10: Earth Ranger Target Protected Areas - Mozambique

Name of Target Protected Areas for Earth Ranger deployment – Mozambique		Hectares (Ha)	WDPA ID	IUCN CATEGORY
National Park	1. Quirimbas	750,000	9035	IV: Habitat/Species Management Area
	2. Banhine	732,300	799	IV: Habitat/Species Management Area
	3. Zinave	412,100	800	Not Assigned
	4. Limpopo	1,115,000	20295	Not Reported
	5. Gorongosa	369,300	801	Not Reported
	Sub-Total (Ha)	3,378,700		
National Reserve	6. Marromeu	155,900	4649	Not Reported
	7. Niassa	3,819,800	555637447	II: National Park
		3,975,700		
TOTAL AREA (Ha)		7,354,400		

8.   The minimum number of hectares with improved management effectiveness that would be achieved by deploying Earth Ranger in two PAs in each country from the list of tentative PAs would be **2,115,200 Ha** (if the smallest PAs would be chosen). However, as the definitive list of PAs will be determined during the PPG phase on the basis of the criteria mentioned below, the target is that at least **2,115,200 hectares** will be under improved management effectiveness.

GEF-7 Management Effectiveness Tracking Tool (METT):

9.   The project will adopt the GEF-7 Management Effectiveness Tracking Tool (METT)[8] to report on progress in improving management effectiveness.

Criteria for selecting the Protected Areas during the PPG Phase:

10.   In consultation with the respective government agencies, a **needs assessment** will be conducted during the PPG Phase to establish which PAs will be selected in the target countries to deploy Earth Ranger. The following criteria will be considered: (a) technological readiness, (b) logistical readiness, (c) Current investments. During PPG, an indepth methodology and criteria for determining Earth Ranger readiness of a PA will be provided.

Recurrent Costs of the Management of the Target Protected Areas:

11.   It is difficult to provide estimates of the recurrent costs of the management of the PAs that we will identify - At this stage, we do not have adequate time and resources to engage stakeholders from the target countries. We will provide this information during PPG Phase.

Link between PAs and Aichi Targets:

12.   Analyses of the broad impact of protection on biodiversity indicates that protected areas have been successful in reducing habitat loss (Aichi Biodiversity Target 5), have had positive impacts on a broad set of species and have lowered the risk of extinction for species whose most important sites were protected (Aichi Target 12) (UNEP-WCMC and IUCN, 2016). Additionally, the full range and value of services and benefits arising from protected areas (Aichi Biodiversity Target 14) will strengthen support to biodiversity financing mechanisms and strategies for protected areas networks (Aichi Biodiversity Target 20), including payments for ecosystem services, allocation of additional government budgets and financing through major development (UNEP-WCMC and IUCN, 2016).

A.   The global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description):

Global environmental problems:

13.   Table 11 provides an overview of status and trends of biodiversity and threats in the target countries as reported to the Convention of Biological Diversity (CBD).

Table 11: Status and trends of biodiversity and threats in the target countries

Country	Status and trends of Biodiversity and threats
Botswana	Botswana is made up of seven eco-regions (Kalahari Acacia-Baikiaea Woodlands, Southern African Bushveld, Zambezian Baikiaea Woodlands, Zambezian and Mopane Woodlands, Zambezian flooded grasslands, Zambezian Halophytics and Kalahari Xerix Savannah). Of these seven eco-regions, two form part of the Global 200 eco-regions, i.e. the central and eastern Miombo woodlands and the Zambezian flooded savanna (Okavango system) which are eco-regions of global conservation priority. Both of these regions have recently had their conservation status classified as Vulnerable. Within Botswana, land use is divided up into Protected Areas, Wildlife Management Areas, Pastoral Residential Areas, Farms and Mining Concessions. As Botswana is a large country with a low population, it has been possible to establish expansive protected areas with over 45% of the country under some form of environmental management. Botswana has a high biodiversity, especially in and around the Okavango Delta with a species richness index between 9.3 and 15. Plant species are estimated at between 2,150 and 3,000, of which 15 are endemic and 43 on the IUCN Red List. There is a rich and diverse number of fauna with 150 identified species of mammals, of which three are endemic and 112 are red-listed, 570 species of birds with 1 near endemic species and 15 red-listed, 131 species of reptile with 2 red-listed, 34 species of amphibian and 99 species of fresh water fish. There is still much missing in terms of available data, distribution of species, breeds and varieties. This lack of knowledge on diversity, status of some species and critical habitats seriously complicates conservation efforts. The seasonal flood plains around the Okavango and Zambezi and extensive wilderness areas support high densities of large mammals and some of the major wildlife migration routes in Southern Africa, making Botswana one of the last refuges for species requiring open range. It is also home to 12 Important Bird Areas (IBAs), with the Okavango delta supporting 463 species. This has resulted in excellent opportunities for Wildlife Tourism, of which Botswana has taken full advantage. High-end safari and birding tourism have allowed Botswana to diversify its economy from what was traditionally diamond-dependent with tourism now accounting for 12% of the GDP. Unfortunately, some of the main threats to biodiversity in Botswana are tourism-related with unregulated motorbike tours threatening fauna in the Magadikadi Pans, and sightseeing parties and vehicles disturbing water bird breeding sites.

Other ecosystem services are also related to the Okavango and Zambezi which provide drinking water, fish and lilies (as a source of food) for indigenous people and rural communities. As a transboundary system, these services are also important to Namibia and Angola.

Threats:

The main threat to biodiversity in Botswana is habitat reduction/destruction and barriers to species movement, although the scale of these threats is dependent on location. Threats from invasive species are still relatively low although, in the southwest of the country, Prosopis glandulosa is starting to become a problem while, in the Okavango Delta, Salvinia molesta poses a threat to the aquatic environment. An invasive bird species, the Indian Myna (Acridotheres tristis), has established itself in Gaborone however little is known about its impacts within Botswana.

Of the seven main eco-regions in Botswana, four are vulnerable. The South African Bushveld is threatened by deforestation, overgrazing through unregulated cattle grazing, range degradation and veldt fires. The Zambezian Baikiaea Woodlands are faced with increased encroachment from unregulated cattle grazing resulting in changing vegetation communities. Zambezian Halophytics are threatened by mining, rangeland degradation, bushfires, wind erosion, increased water extraction for irrigation resulting in increased salinity, disruption of migration routes through fencing, overgrazing, lack of protection for avian breeding sites and uncontrolled tourism.

Climate change is emerging as a major threat to biodiversity in the Okavango Delta. An integrated hydrological model, developed to assess the Okavango Delta hydrological response to various natural and anthropogenic scenarios, projected that climate change will potentially have the greatest impact on the Kalahari basin and the delta.

Other specific threats to species are related to poaching, particularly to flagship species such as Rhinos and Elephants; there are however extensive anti-poaching measures in place.

Mozambique	Located on the southeastern seaboard of Africa, Mozambique possesses five phytogeographical regions with Miombo, Mopane, undifferentiated woodlands and coastal mosaics being the most common. Sites of high importance in regard to biodiversity include the Gorongosa Mountains, the Great Inselberg Archipelago of Quirimbas and the Chimanimani Massif. Three biodiversity hotspots are found in Mozambique: the Coastal Forests of Eastern Africa, the Maputaland-Pondoland-Albany and the Eastern Afromontane. In addition, the Zambezian Coastal Flooded Savannah is an eco-region unique to Mozambique. According to national estimates, Mozambique is home to about 5,500 species of flora and 4,271 species of terrestrial wildlife, of which 72% are insects, 17% birds, 5% mammals and 4% reptiles. Of these species, several are endemic to Mozambique, including 2 species of mammal, 7 reptiles, 11 freshwater fish and 5 vascular plant species. There are a total of 300 species on the IUCN Red List in Mozambique, of which 120 are threatened.

With a coastline 2,770 km long, Mozambique has several marine and coastal habitats, the most important of which are the coral reefs, mangroves and seagrass meadows. The coral reefs cover about 1,860 km2 and there are about 400,000 ha of mangroves. There are no species lists for individual countries however, along the Indian Ocean Coast, 11,257 marine species have been recorded and 17 marine fish are endemic to Mozambique. Notable species that have been recorded along the coasts of Mozambique include the dugong, 7 species of dolphin, humpback whales, 77 hermatypic species of coral and 5 species of turtle, all of which contribute significantly to tourism.

There are extensive benefits and ecosystem services arising from biodiversity in Mozambique which affect the entire population. These include the provision of timber for firewood, furniture, sculpture, etc., water supply/purification, soil fertility and flood protection. In addition, most of the important traditional and modern medicines within Mozambique are derived from wild plants, animals, fungi and bacteria. Medicinal plants are used by an estimated 80% of the population and the importance of the role of traditional healers is increasingly recognized. Biodiversity also provides significant benefits to Mozambique's economy through the generation of revenue from eco-tourism.

Threats:

Major threats to biodiversity are population increase, development and past political instability which have all led to habitat loss and fragmentation, as well as to great changes in the number and distribution of large terrestrial mammals. During the civil war period, terrestrial fauna suffered a massive decline however, since 1992, the Government has been directing efforts towards the recovery of lost populations, especially within conservation areas.

The main threats to fauna are hunting, uncontrolled fires and the destruction of habitats, whereas the main threats to flora are vegetation clearing, slash-and-burn agriculture, increased human settlement and uncontrolled fires.

The main threats to mangrove forests are deforestation, aquaculture and construction of salt pans. Coral reefs are mainly under pressure from coral bleaching and increased activities in coral reefs (fishing, tourism, etc.). Seagrasses are being threatened by siltation due to floods, revolving of seagrass to collect invertebrates, trampling and destructive fishing techniques.

Due to population pressure, there have also been increased reports of human-animal conflicts, especially regarding crocodiles, lions, elephants and hippos, with 265 people killed and 82 people injured between 2006 and 2008, and of damage to agriculture caused by hippos and elephants.

Republic of Congo (RoC)	The Republic of Congo has 15 protected areas representing approximately 11% of the country (surface area of 3,655,402 ha).

Congo possesses great terrestrial ecosystems, with various forest types representing 65% of the territory. The three major forests (Mayombe forest - 1,503,172 ha; Chaillu forest - 4,386,633 ha; North-Congo forest - 15,991,604 ha) account for a total of 22,471,271 ha.

Congo's landscape is covered to a large extent by the second largest rainforest in the world and a great hydrological network, housing a rich diversity of flora and fauna species. This richness is however poorly known and biodiversity in general is being degraded through deforestation from logging concessions, land clearing from agricultural expansion, and bushmeat hunting for commercial purposes. Hence the extent of some forests type is fragile and slowly being replaced by savannahs following increasing human activity. High and increasing demographic pressure is especially visible around the cities, where many plant species have become rare or have almost disappeared following oversampling of their organs or destruction of their habitat. In addition, inland and marine water resources are also at a depleted state subsequent to pollution from agriculture, unsustainable fishing practices and the growing presence of invasive alien species.

An increase in the number of logging roads resulting from forest exploitation has opened up pathways, making wildlife more accessible to poachers and those involved in the lucrative business of bushmeat and hunting trophies (ivory tusks and skins of certain protected species). Thus rarefaction of wildlife is visible and threatens already endangered species, such as the world's largest population of western lowland gorillas (Gorilla gorilla gorilla), listed on the IUCN Red List as critically endangered, elephants, marshbucks (Tragelaphus spekii) and bongos. In fact, waterbucks and lycaons are species that have already disappeared.

The savannah grasslands occupy the other 35% (12 million ha) of the territory with a portion totaling 300,000 ha (1% of the total area) lying in the littoral zone. This wide grassland surface offers enormous potential for livestock breeding. Yet, very little farming is practiced. The hydrographical network (225,000 km2) is also of great importance. It is organized around two main watersheds: the Congo River Basin (4 million km2) and the Kouilou-Niari River Basin (60 000 km2) providing various ecosystems (fresh and marine water, mangrove and coastal forests, wetlands, beaches, etc.) and rich biodiversity. These ecosystems are showing increasing signs of degradation thus endangering many aquatic species. Snakes, lizards and turtles are however abundant despite the environmental variability linked to anthropogenic actions.

<u>Threats</u>:

Main threats are anthropogenic, climatic and motivated by various factors such as: people's need for food and energy, industrial development, illegal wildlife trade and hunting trophies, epidemics and viral diseases, as well as socio-political troubles experienced by the country in the 1990s. Deforestation and the uncontrolled harvesting of non-timber forest products, shifting cultivation, and bushfires are the main pressures to forest ecosystems.

The non-existence of adequate monitoring mechanisms for vegetation worsens the situation. Wildlife habitats are being destroyed and fragmentation perpetrated by these activities affects the ecological balance. Genetic erosion is occurring as a result of the depletion of plant species, or the disappearance of endemic ones.

Unsustainable agricultural methods (shifting cultivation, slash and burn agriculture, use of fertilizers and pesticides, uncontrolled grazing land management) are also putting pressure on natural ecosystems. Inland waters are threatened by overexploitation, destructive fishing methods (use of non-regulatory mesh nets, chemicals, explosives), and invasive alien species, while marine waters are threatened by dredging, pollution from oil exploitation, overfishing without quotas compliance and coastal erosion destroying the spawning grounds.

Source: UN Environment – CBD Secretariat, 2020[9]

Barriers:

14. The key barriers which will persist in the absence of the GEF intervention, include:

Barrier#1: In-adequate capacity (technical, financial and human resources) for effective management of protected areas: State protected area management authorities across Africa frequently face funding shortages that constrain their ability to achieve high levels of management effectiveness. Inadequate funding impedes investment in equipment, technology, staffing and capacity building activities (AWF, 2020) which would improve management of protected areas. Notably, majority of protected areas in Africa lay on some of the world's vast, remote landscapes and politically unstable regions and are home to diverse plant and animal species which are threatened by poaching, human-wildlife conflicts, insecurity and human encroachment which is mainly attributed to large-scale infrastructure, logging, agriculture, rapid rise in population (AWF, 2020). Shortage of skilled human resources and adequate equipment coupled with low funding impedes effective monitoring of the vast remote PAs which exacerbates the already existing environmental issues. The aim is to deploy this technology within a resource constrained environment where state protected area management authorities do not have enough resources for liberal deployment.

Barrier#2: Inadequate response mechanisms to wildlife crime: Wildlife crime is the fifth largest international criminal activity worldwide and it is becoming increasingly organized and more ruthless. Managers, rangers and their families are intimidated, attacked and killed whereas local communities suffer threats, disturbance and loss of natural resources from reserves. Protected areas are further exposed in many countries by weak judicial processes that fail to prosecute wildlife traders even if they are caught. This therefore calls for long-term changes in management in protected areas more emphasis on patrolling and enforcement along with efforts to address corruption, strengthen the judiciary and improve enforcement along the rest of the trade chain. The Earth Ranger Technology will improve monitoring and patrolling of PAs and inform more tactically astute deployment of available law enforcement resources and more focused deployment of available wildlife management resources.

Barrier#3: Insufficient knowledge, awareness and access to useful information related to using conservation technologies to effectively manage Protected Areas coupled with weak coordination between authorities in charge of managing protected areas: This has led to low up-take of conservation technologies by PA management authorities and in-adequate sharing of up-to-date useful information amongst PA management authorities (at regional, national and local levels) which could significantly improve management of the PAs. Notably, the Earth Ranger technology has been deployed in over forty (40) sites in Africa and Asia and this project creates an opportunity for strengthening coordination, learning and sharing at regional, national and local levels.

Case studies: How Earth Ranger is addressing selected global environmental problems in Africa:

15.   Since 2014, Vulcan Inc. has been working on a real-time situational awareness software program, now called Earth Ranger, to enable and capacitate improved management effectiveness through deployment of technology. Earth Ranger is a data visualization and analysis software for Protected Area Management. This technology collects, integrates and displays all historical and real-time data available from a protected area—wildlife, the rangers protecting them, spatial information, and threats. Earth Ranger empowers protected area managers and rangers to take immediate, proactive actions to prevent and mitigate threat incidents.

16.   To date, Earth Ranger has been successfully deployed across numerous public and privately managed protected areas during the proof of concept phase. Now that Earth Ranger has been suitably tested with a proven track record of success, the GEF and Vulcan wish to deploy this software together with other enabling technologies across state owned and managed protected areas in Africa to help state protected area management authorities achieve higher levels of management effectiveness on an enduring basis.

17.   Table 12 outlines case studies where the Earth Ranger Software was instrumental in addressing global environmental problems, root causes and barriers in selected Africa countries.

Table 12: Case studies – how Earth Ranger is addressing selected global environmental problems in Africa

Global environmental problems, root causes and barriers		Earth Ranger (ER)	Impact
C o u n t r y: M	Human Wildlife conflict: With their metabolism, elephants are required to eat for 16 or more hours a day. This translates into a lot of eating and makes calorie rich crops especially attractive to roving pachyderms. This challenge is familiar to farmers near Liwonde National Park in Malawi, where elephants' crop raiding costs farmers lost revenue and increases tension between humans and wildlife. With the risk of their crops being eaten at night, farmers were required to stay up through the ni	Using Location Monitoring to Reduce Human Wildlife Conflict Managed in partnership with African Parks, Liwonde's security team uses EarthRanger to monitor when elephants pass geographic boundaries in order to intervene before they reach farmers' crops. With the ge	With reduced crop raids, farmers have achieved better crop yield and greater proceeds from crop sales, which allow them to send children to school.

alawi *Liwonde National Park, Malawi* *2017*	eing eaten at night, farmers were required to stay up through the night to scare animals away, and in some instances would be forced to take violent means to protect their crop	o fences in place, Liwonde rangers are able to constantly monitor the park boundary for potential human wildlife conflict. They are also more quickly able to respond to geofence breaks and intervene before tensions escalate with community members.	With increased access to education, more people around Liwonde are developing skills to pursue employment and contribute to their communities. What is more, human deaths from animals has decreased as interventions are applied before mortal conflict arises. With African Parks more quickly responding to potential conflicts, community trust has grown as well.

| Country: Tanzania Grumeti Game Reserve 2 | Security:

Monitoring vast areas is extraordinarily difficult, but EarthRanger has helped the team better monitor park boundaries and ranger activity and has contributed to declines in poaching activity in the park. | Park Boundary Monitoring Results in Decreased Poaching

Grumeti used ER's heatmaps to analyze the patterns of some of the rangers, and identified one ranger who was spending an odd amount of time in an area he was not supposed to be in. Further investigation found that the area was a hangout for poachers, and the ranger was working with them. The ranger was discharged and was prosecuted for related activities. | With the help of EarthRanger, Grumeti is able to maintain reports in a more organized way, ensuring that planning is based on the most complete set of data available.

EarthRanger helps the team better monitor park boundaries and has contributed to declines in poaching activity in the park |

0 1 7			
C o u n t r y: K e n y a A m b o s e li N a ti o n a l P a r k K e n	· Ecological Management · Human Wildlife conflict Human population growth and expanded development in the Amboseli ecosystem has led to decreased habitat for elephants and other wildlife. In particular, development can cut off access between different wild spaces—increasing the risk for human wildlife conflict and potentially infringing on traditional migratory behavior. Kenya Wildlife Service (KWS) deployed EarthRanger at its Headquarters at Nairobi National Park. KWS is seeking to smooth reporting and response of human wildlife conflict across Kenya	**Big Life: Using Data to Ensure Safe Wildlife Corridor Migration** Big Life, a wildlife conservation advocacy group based in Kenya's Amboseli ecosystem, has been investing to develop wildlife corridors that allow wildlife to move between protected areas. To ensure the corridors are maintained and to monitor how frequently wildlife are using them, Amboseli utilizes ranger reports, camera traps, and other technologies. Data from those technologies are consolidated in EarthRanger, where activity is then visualized on an intuitive map.	Using EarthRanger, Amboseli has monitored its wildlife corridors and ensured wildlife are passing through them successfully. In May 2019, Amboseli tracked the successful passage of a 31-year-old male elephant, Jenga, through its Amboseli-Tsavo corridor. With the corridors in place and EarthRanger active, Amboseli is equipped to support safe, human conflict-free passage of wildlife between key preserves—a key component of a thriving wildlife population.

y a W il d li f e S e r v i c e			

<div align="center">Source: Vulcan Inc., 2020^[10]</div>

B. The baseline scenario and any associated baseline projects:

Baseline scenario:

18.   In the absence of information and real-time situational awareness, protected area managers are compelled to deploy the limited resources and assets at their disposal on a random basis in the hope of acheiving satisfactory area coverage, monitoring and enforcement. This is almost always inefficient and ineffective with very limited impact towards improved management effectiveness. Protected areas that have adopted new and emerging technologies to improve real-time situational awareness will attest to the impact this has had on management effectiveness and improved efficiencies of deployment. To date, new and emerging technologies have mostly been adopted by privately managed protected areas, which have been those areas able to afford the risk of adopting untested assets. However, after numerous examples of successful deployment of such technologies across Africa, methodologies have been refined and improved to the point that such suites of technologies can now be deployed with confidence.

19.   The Earth Ranger technology has visualization capability that allows managers to gain real-time, in-depth understanding of activities related to poaching and other habitat threats. This feature enables PA managers to monitor vast areas remotely, to keep track of wildlife as well as rangers in the field to be sure that patrols are carried out as required and by keeping track of rangers, their safety is assured and response teams can be dispatched immediately a situation arises. Without this technology in place:

·   Teams will maintain paper-based reports and sort them for record keeping back at headquarters. Reports can easily be lost or destroyed by natural conditions in the field, leading to gaps in data and an incomplete picture of activity in the protected area.

·   Safety of the protected area management teams and wildlife is at risk and response to a situation (e.g., poachers) will be slow.

·   Managing the vast protected areas will be impossible given the few number of personnel. This means challenges such as poaching, encroachment, human wildlife conflicts etc. will escalate since most of the issues will not be addressed in time.

20.   The Earth Ranger Technology also has access to real-time and historical analyses and gives key insights into trends such as animal behavior, ecological changes, and more. This enables the PA managers to monitor their habitat (including wildlife, forests, and other landscapes) through sensors, reports, and field data to more effectively manage the protected areas. Without this technology in place:

·   Human-wildlife conflicts will increase because change in animal behavior (e.g., change in migration routes, grazing areas, drinking water points, encroachment by surrounding communities) will not be realized and addressed in good time hence triggering conflicts

·   Without establishing trends such as animal behavior and ecological changes, the PAs management teams will not be able to make decisions that will address current and future threats facing PAs.

21.   The Earth Ranger Technology is capable of quantifying key information and show tangible results of the Protected Area Management Team. Without this technology in place:

·   PAs management teams will be unable to demonstrate their results to donors which will lead to reduction in funding. This will exacerbate the already dire situation in Africa where PAs effectiveness is undermined by funding shortfalls.

22.   The baseline scenario typical of most protected areas in Africa is of impaired management effectiveness resulting from chronic lack of funding. Protected area managers are required to deploy the limited resources and assets at their disposal with very limited information and/or real-time situational awareness. This exacerbates the inefficient and ineffective use of these resources. Knowing when and where to deploy resources in a resource-constrained environment is absolutely key to deterring illegal activities within a protected area and to generally optimize effort in the field.

Baseline projects:

23.   Ongoing initiatives that seek to improve management of Protected Areas are briefly described below:

Title of Project: Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development Program

Project location: Afghanistan, Botswana, Republic of Congo, Cameroon, Ethiopia, Gabon, Indonesia,

India, Kenya, Mali, Malawi, Mozambique, Philippines, Thailand, Tanzania, Viet Nam,

South Africa, Zambia, Zimbabwe

Donor: GEF6 (via World Bank)

Duration: 2015-2022

Description: The GEF-6 Global Wildlife Program (GWP) is a Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development USD 131 million grant program funded by the Global Environment Facility (GEF) and led by the World Bank Group. The GWP intervenes at the global, regional, and national levels. The World Bank Group's global coordinating project establishes a learning and coordination platform to promote enhanced Illegal Wildlife Trade (IWT) interventions and increase technical capabilities. Country-based and regional projects focus on designing and implementing national strategies to improve wildlife and protected area management, enhance community livelihood benefits, strengthen law enforcement and reduce demand through changing behavior. The implementing agencies channeling the funds to the governments or other partners for the national projects are the World Bank Group, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), and the Asian Development Bank (ADB). The GWP also collaborates with the International Consortium on Combating Wildlife Crime (ICCWC) and other donors and conservation partners to implement an integrated approach for biodiversity conservation, wildlife crime prevention and sustainable development, including: The Global Environment Facility (GEF), International Union for Conservation of Nature (IUCN), The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat, TRAFFIC, WildAid, Wildlife Conservation Society (WCS), World Wildlife Fund (WWF)

Title of Project: The Biodiversity and Protected Areas Management Programme (BIOPAMA)[11]

Project location: African, Caribbean and Pacific (ACP) countries - **Botswana, Mozambique, Republic of**

Congo are amongst the 79 countries benefitting from the BIOPAMA project.

Duration: 2017 - 2023

Description: BIOPAMA aims to improve the long-term conservation and sustainable use of natural resources in African, Caribbean and Pacific (ACP) countries, in protected areas and surrounding communities. BIOPAMA is a 60 million Euro investment to improve the long-term conservation and sustainable use of biodiversity and natural resources. It is an initiative of the ACP Group of States financed by the European Union's 11th European Development Fund (EDF), jointly implemented by the International Union for Conservation of Nature (IUCN) and the Joint Research Centre of the European Commission (JRC). The Regional Observatories for Protected Areas and Biodiversity are the central pillar of BIOPAMA's work. They support data collection, analysis, monitoring and reporting, develop the capacities of staff and organizations to manage this information and provide policy guidance for better decision making on biodiversity conservation.

Title of Project: Support to Eligible Parties to Produce the Sixth National Report to the CBD (Africa-1)

Project location: Burundi, **Botswana**, Central African Republic, **Congo,** Djibouti, Eritrea, Ethiopia, Gabon,

Kenya, Comoros, Rwanda, Sudan, South Sudan, Chad, Tanzania, Uganda, Congo DR

Donor: GEF (via UNDP)

Project amount: USD 1,963,500

Description: The project seeks to provide financial and technical support to GEF-eligible Parties to the Convention on Biological Diversity (CBD) in their work to develop high quality, data driven sixth national reports (6NR) that will improve national decision-making processes for the implementation of NBSAPs; that report on progress towards achieving the Aichi Biodiversity Targets (ABTs) and inform both the fifth Global Biodiversity Outlook (GBO5) and the Global Biodiversity Strategy of 2021 – 2030.

Title of Project: Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes

Project location: Angola, Burkina Faso, **Botswana,** Kenya, Kazakhstan, Mongolia, Malawi, **Mozambique**, Namibia, Tanzania, Zimbabwe

Donor: GEF 7 (via FAO)

Project status: Concept approved 2019

Project amount: USD 95,844,674

Description: The programs objectives are a) Integrated landscape management with particular focus on sustainable forest management and restoration, rangelands, and livestock production; b) Promotion of diversified agro-ecological food production systems in drylands considering their biodiversity; c). Creation of an enabling environment to support the two objectives above.

Title of Project: Integrated Transboundary River Basin Management for the Sustainable Development of the Limpopo River Basin

Project location: Botswana, Mozambique, South Africa, Zimbabwe

Donor: GEF 6 (via World Bank)

Project status: Concept approved

Project amount: USD 6,000,000

Description: The project seeks to promote sustainable development in the Limpopo River basin through the application of Integrated Water Resources Management (IWRM) at the transboundary, national, and local scales to balance environmental, social and economic benefits.

Title of Project: Strengthening the conservation of globally threatened species in Mozambique through improving biodiversity enforcement and expanding community conservancies around protected areas

Project location: Mozambique

Duration: 2017 -2024

Donor: GEF (via UNDP)

Project amount: USD 15,750,000 Million

Description: Expected Key Achievements include: (a) Conservation of globally threatened species in Mozambique strengthened through implementation of the Conservation Areas Act; (b) Improved biodiversity enforcement; (c) Expanded protected areas through community conservancies and target the rural development activities

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Title of Project: Mozambique conservation Areas for Biodiversity and Development (MOZBIO)

Project location: Mozambique

Donor: GEF (via World Bank)

Project amount: US$46.32 Million

Description: The objective of the project was to increase the effective management of the Conservation Areas (Cas) and enhance the living conditions of communities in and around the CAs. MOZBIO supports ANAC and especially PAs other than Niassa and Gorongosa in improving PA management effectiveness. Activities under component 1 of the GEF 6 intervention are closely linked. Improved PA management will also improve anti-poaching, wildlife and forest crime and IWT efforts. Specifically, interventions on human resource management and improvement are dovetailed between the GEF 6 and MOZBIO interventions. There is no potential overlap, but rather strong potential for synergies, collaboration and lessons learning.

Title of Project: The Congo Basin Sustainable Landscapes Impact Program (CBSL IP)

Project location: Central African Republic, **Congo,** Cameroon, Gabon, Equatorial Guinea, Congo DR

Donor: GEF7 (via UN Environment)

Project Status: Concept approved

Project amount: USD 57,201,127

Description: The objective of the Republic of Congo's child project is to promote a model for integrated community-based conservation and protected area management applied to the peatland area and forest ecosystems of the Republic of Congo

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Title of Project: Strengthening the Management of Wildlife and Improving Livelihoods in Northern Republic of Congo

Project location: Republic of Congo (project sites Nouabale-Ndoki National Park, Ntokou Pikounda National Park)

Donor: GEF 6 (via World Bank)

Project duration: 2017 - unknown

Project amount: USD 6,509,761

Description: The project seeks to Increase the capacity of the forest administration, local communities and indigenous peoples to co-manage forests.

Title of Project: Integrated and Transboundary Conservation of Biodiversity in the Basins of the Republic of Congo

Project location: Republic of Congo

Donor: GEF 6 (via UNDP)

Project duration: 2017 - 2023

Project amount: USD 3,125,250

Description: The project seeks to Strengthen the Conservation of Globally Threatened Species in the Basins of the Republic of Congo by Improving Biodiversity Enforcement. The long-term solution proposed by the project aims to protect unique biodiversity of Congo and the Tri-national Dja-Odzala-Minkebe transboundary area in particular via i) a strategy for strengthening the PA network through expansion of protected areas, effective functional zoning to incorporate sustainable development and biodiversity conservation, and integrative management planning; ii) strengthening capacity for effective PA and Illegal Wildlife Trade governance in Congo; and iii) reducing poaching and illegal trade on threatened species via Community-Based Wildlife Management (CBWM), Community-Based Natural Resource Management (CBNRM) and sustainable livelihood.

C.   **The proposed alternative scenario with a brief description of expected outcomes and components of the project:**

24.   **Component 1:** Installation of Earth Ranger software together with other required technologies and infrastructure to achieve Earth Ranger readiness.

The deployment of technologies to improve real-time situational awareness within the context of a resource constrained environment will greatly enable protected area managers to deploy the limited assets and resourcesd at their disposal in a more informed, effective and efficient manner, thereby improving impact and overall management effectiveness.

Outcome 1.1: Strengthened institutional and technical capacity of participating countries to effectively manage protected areas.

The target protected areas for the deployment of technologies through this project remain to be determined in consultation with the relevant state authorities in Botswana, Mozambique, and Republic of Congo. However, it is anticipated that this project will improve management effectiveness in at least one but potentially up to three protected areas in each target country. Priority will be given to those protected areas where real-time situational awareness will assist

efforts to protect high-value species such as rhino and/or elephant and or other rare and endangered species that are under threat from commercial-scale poaching. It remains for a detailed needs-analysis to be conducted for each selected protected area to identify fit-for-purpose technology requirements, but generally, the expected activities include the following for each protected area that is selected:

a.   Construction (where required) or refurbishment of control room infrastructure sufficient for effective 24-hour, 7-day a week operations.

b.   Installation of the necessary computer hardware in each control room

c.   Installation of comfort accessories as required in each control room (e.g. toilet facilities, airconditioner)

d.   Installation of the required hardware to enable suitable backhaul capabilities for reliable access to the internet. This will include contracts with internet service providers for up to 3 years.

e.   Installation of the Earth Ranger software on the control room computer equipment as an aggregator of real-time data feeds

f.   Installation of a digital radio communications or other suitable communications system for the environment of the protected area[12] system across each selected protected area to enable reliable voice communications on hand-held, vehicle and base-station radios, with the co-benefits of these systems enabling live tracking of personnel and assets and a real-time SOS function.

g.   Where required to support the flow of data in real-time from the field, LoRa WAN systems will be installed to provide connectivity across each protected area. These systems support tens of thousands of transmitters which can be readily and affordably installed on almost all assets for two-way, low bandwidth data communication. Once installed there is no recurrent cost.

h.   Installation of sensor and tracking technologies that are considered fit-for-purpose for a particular protected area to detect illegal activities and/or to monitor key wildlife species or other assets.

i.   Aggregation of open-source data feeds on Earth Ranger that will improve management decision-making (e.g. NASA FIRMS to track occurrence and spread of fires).

j.   Training of management and control room staff on all technologies that are deployed in a particular protected area.

The target for outcome 1.1 is

-      At least 2,115,200 hectares of protected areas with improved METT scores *(hectares, baseline and target METT scores TBD in the PPG phase)*

Outcome 1.1 will be achieved through the following **outputs:**

Output 1.1.1: Earth Ranger software incorporated in the existing PA management structure in the target countries

Output 1.1.2: A dedicated, secure and functional control room facility established to be used by management to improve real-time situational awareness through deployment of Earth Ranger technology in each PA in the target countries

Output 1.1.3: Required built infrastructure and internet backhaul capabilities installed in at least one protected area in each target country

Output 1.1.4: Digital radio communications network installed and functional in each of the selected protected areas in the target countries.

Output 1.1.5: LoRa networks installed as required to provide connectivity from the field to the control room *(LoRa networks will be installed where a selected protected area does not have GSM coverage, a low bandwidth local)*

Output 1.1.6: Protected area management staff trained to utilize Earth Ranger software (sensors, radios, satellite collars and other data transmitters)

25. **Component 2**: Learning and knowledge sharing on the Earth Ranger technology.

This component seeks to increase uptake and enhance awareness about benefits of conservation technologies – in this case Earth Ranger technology. It is anticipated that through widespread dissemination of Earth ranger's success stories, other African countries will gain interest to install and use conservation Technologies to manage their PAs.

Outcome 2.1: Additional Countries interested and committed to install Earth Ranger technology.

The main activities under this component are: Sharing of project's lessons and success stories through supporting exposure site visits by other African countries to selected PAs and dissemination of information through various modes of communication. Success stories and lessons learnt from this project will be disseminated through the Earth Ranger Website (https://earthranger.com/About-Us.aspx) and other media outlets and social media platforms that will be identified during the PPG Phase.

The target for outcome 2.1 are:

Target:

-       At-least 3 countries committed to install Earth Ranger Technology.

Outcome 2.1 will be achieved through the following **outputs:**

Output 2.1.1: Learning site visit (atleast 1 exposure trip) (*sponsored by the project)* undertaken by other African countries to at-least 1 PA.

Output 2.1.2: Success stories published on blogs, websites etc *(where the Earth Ranger software informed decisions in management of PAs).*

D.　**Alignment with GEF focal area and/or Impact Program strategies:**

26.　This project is aligned with the GEF-7 biodiversity (BD) Focal Area Strategy. Specifically, the project falls under **BD-2.7**: *Address direct drivers to protect habitats and species and Improve financial sustainability, effective management, and ecosystem coverage of the global protected area estate.*

27.　Improved management effectiveness is essential for protected areas to persist as reservoirs of biodiversity. Deployment of tested technologies such as the Earth Ranger represents a cost-effective means to amplify management capabilities through improved real-time situational awareness, with additional co-benefits of improved voice communications, data transmission, data storage and data analytics. The table below further demonstrates how this project is aligned with the GEF- Programming directions.

Table 13:Alignment with the GEF-7 focal area Strategies

GEF-7 Focal area strategy	GEF-7 Delivery Mechanism *(Focal Area Investment)*	The Proposed project
Biodiversity **Goal:** to maintain globally significant biodiversity in landscapes and seascapes. **Objective II:** Address direct drivers to protect habitats and species ü Enhance the effectiveness of protected area systems **BD-2.7:** Address direct drivers to protect habitats and species and Improve financial sustainability, effective management, and ecosystem coverage of the global protected area estate	Improving Financial Sustainability, **Effective Management,** and Ecosystem Coverage of the Global Protected Area Estate	**Title:** Achieving Earth Ranger-Ready Operational Capacity **Objective:** To strengthen management effectiveness of priority Protected Areas (PAs) in Africa to deliver Global Environmental Benefits through deployment of the EarthRanger Protected Area Management system. **Outcomes:** *Outcome 1.1*: Strengthened institutional and technical capacity of participating countries to effectively manage protected areas *Outcome 2.1:* Countries interested and committed to install Earth Ranger technology.

Source: GEF, 2018[13]

E.   Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing:

28.   New and emerging technologies that combine to improve real-time situational awareness have been trialed at numerous protected areas across Africa and beyond. Key technologies that have emerged include:

-        **Vulcan Inc.'s Earth ranger software** platform that aggregates information from the field in real-time. Aligned with Earth Ranger is the deployment of (a) digital radio systems to not only improve voice communications but to also enable real-time tracking of personnel and other assets such as vehicles, (b) LoRa WAN systems to provide connectivity over remote protected areas where GSM is not present, and (c) numerous other sensor technologies that are applied and depoyed on a fit-for-purpose basis. Examples of protected areas where such technologies have been deployed include:

·   Lewa Downs Reserve, Kenya

·   Akagera National Park, Rwanda

·   Liwonde National Park, Malawi

·   Grumeti Reserve, Tanzania

·   Gonarezhou National Park, Zimbabwe

·   North Luangwa National Park, Zambia

·   Sabi Sands Reserve, South Africa

·   Nairobi National Park, Kenya Wildife Service, Kenya

29.   All of the above PAs will attest to the positive impact the deployment of Earth Ranger has had on achieving management effectiveness through improved real-time situational awareness.

30.   Other common existing tools for data gathering and surveillance used to manage Protected Areas in Africa are described below. Notably, during PPG Phase (after finalising the list of PAs), we will add the specific technologies being used in each PA and explain how the existing technologies will complement Earth Ranger.

-        **Cyber Tracker** (Mongabay, 2020[14]): The handheld Cyber Tracker enables PA staff to monitor, protect and conserve the critically endangered Cross River gorilla and its forest habitat, improve law enforcement by facilitating the monitoring of wildlife, human interferences and patrols through generation of spatial and statistical analyses from the data collected. Use of the CyberTracker is expanding to other PAs in West Africa and globally, in combination with SMART analysis software.

-        **Open Data Kit** (Mongabay, 2020[15]) enables PAs staff to work offgrid and users can transfer data collected in the field from the mobile device to a server and upload to Excel, Google Maps, or more sophisticated statistical analysis software. The Open Data Kit uses a set of free and open-source survey tools, can integrate GPS locations, photos, videos and audio files into customized forms, while also working off-the-grid.

-        **Monitoring System for Tigers - Intensive Protection and Ecological Status (M-STrIPES app)** Forest guards in India's Tiger reserves are equipped with personal digital assistants and GPS devices to capture data related to tiger movements, sightings, deaths, wildlife crime, observations while patrolling e.g., human encroachment, habitat change. The software also maps the routes taken by forest guards with the objective of enhancing the effectiveness and spatial coverage of patrols. The Forest guards can use smartphones to quickly collect and upload data on tigers and their prey to a central server

-        **Camera traps:** These are remote cameras that take photos when a sensor is triggered by the movement of an animal or person and, increasingly, send the image in real-time to the operator. They have helped researchers document the presence of elusive wildlife for decades. These cameras have also helped to study species behavior in the dark.

- **LoRa Communications Network:** This is a new low-bandwidth technology emerging from the Internet of Things innovations. The application of this technology will help to improve the monitoring of all kind of variables that are relevant to reduce conflicts between people and wildlife. The LoRaWan network technology, connected to several sensors placed in the field, enables us to create a network of communication tools to alert people when elephants are approaching or when electric fences are not working properly. This will save lives of both people and wildlife.[16]

31. **Expected contributions: How EarthRanger will contribute to improve PA management effectiveness:** Earth Ranger's visualization and real-time capabilities cover both land and marine areas and can alert protected area managers when critical threats are identified. This technology will empower protected area managers and rangers to take immediate, proactive actions to prevent and mitigate threat incidents. As part of this process, the project will provide intrinsic and vital protection for globally significant biodiversity within the selected PAs, that is additional to what would be achieved in the baseline scenario.

Table 14:Incremental/additional cost reasoning

Baseline practices in the PAs	Alternatives to be put in place by the Earth Ranger project that will improve PA management effectiveness	Global Environmental Benefits provided through the employment of Earth Ranger[17]
1. Weak institutional and technical capacity of participating countries to effectively respond to current and future environmental, social and economic threats facing PAs. 2. Safety and security of rangers at risk due unpreparedness to respond to situations e.g., poachers 3. Human Wildlife conflicts 4. Low capacity (technology, human and financial) to protect and manage Biodiversity covering vast areas (which are mostly remote) drives further biodiversity loss and ecosystem degradation	Installation of the Earth Ranger Technology in the selected PAs resulting to strengthened management effectiveness of priority Protected Areas (PAs) to effectively respond to current and future environmental, social and economic threats. Earth Ranger technology will: 1. Enhance safety and security of both Protected Area management field teams and Biodiversity: This technology has visualization capability which allows managers to gain real-time, in-depth understanding of activities related to poaching and other habitat threats. 2. Strengthen Ecosystem Management: Earth Ranger is able to monitor habitats including wildlif	Biodiversity · Protection and conservation of globally significant biodiversity and threatened species within the PAs (*spp to be identified during PPG - we have not identified the PAs*). · More than 2,115,200 Ha of PAs safeguarded through effective management resulting to protection and conservation of biodiversity against poaching, destruction of habitats through human encroachment, illegal harvesting and trafficking of threatened species (*the exact number of Ha will be provided during PPG – we have not identified the PAs*) · Protection and conservation of forests and water bodies within the PAs hence increase carbon sinks which mitigate GHG emissions

5.   Encroachment in search of agricultural land; logging resulting to deforestation

6.   Low uptake and awareness about benefits of conservation technologies such as the Earth Ranger

...nter habitats including wildlife, forests, and other landscapes through sensors, reports, and field data which will ensure effective management of protected areas hence promoting ecological integrity and subsequent ecosystem services including carbon sinks, tourism etc.

3. **Promote Human-Wild life Co-existence:** Proactive mitigation through timely and seamless recording of incidents and geo-fence alerts will enable managers to reduce conflict incidents and help communities and human settlements coexist with wildlife (human wildlife conflicts will be significantly reduced).

4. Capacity of PA management teams is built to protect and monitor the PAs and prevent loss of biodiversity (including globally significant biodiversity and threatened species)
5.
    Greater public awareness about benefits of conservation technologies such as the Earth Ranger

. Transboundary collaboration with neighboring countries to manage the PAs using conservation technologies

32.   Co-financing: Indicative total co-financing is <u>USD 2,527,500</u>

-       **Private Sector:** Vulcan Inc. has committed $2M (cash) co-financing. In addition, Vulcan will contribute EarthRanger as an in-kind donation. This includes the typical FTE effort to set up new EarthRanger sites, support and training. The estimated value is $6,250 per site per year for software and $15,000 per site for training and support over the course of the project. For six sites the total in-kind value would be ~$202,500.

During PPG Phase, we will identify and follow up on cofinancing with Private sector institutions operating in the target PAs.

-       **Conservation International Africa Field Division** will provide inkind co-financing: It is proposed that the PMU will be based in CI Africa Field Division office but will report to Vulcan Inc. This arrangement will be discussed in detail during the PPG Phase. Additionally, CI will provide cash cofinancing of USD 25, 000.

During PPG Phase, we will identify and follow up on cofinancing with CSOs operating in the target PAs.

-       **Participating Governments**:

·   Botswana has committed $ 300,000 (cash)

·   During PPG Phase, we will identify in-kind and cash co-financing that will come from each PA where we will work, but those PAs will be determined in the PPG phase.

F.   Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF):

33.   Protected Areas play a significant role in biodiversity conservation and providing ecosystem services. Improved management effectiveness will make the selected protected areas more resilient against the growing threats to natural capital as demand for land, protein and high-value commodities continues to increase. This improved resilience will deliver enduring benefits for the safeguarding of biodiversity, ecosystem functioning and ecosystem provisioning. In addition, the project will contribute to **SDG 1**— End poverty in all its forms everywhere; **SDG 15** - Life on land (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

34.   Through Earth Ranger technology, management of at least 2,115,200 hectares of protected areas in the target countries will have improved METT scores (*hectares, baseline and target METT scores TBD in the PPG phase)* resulting to protection and conservation of biodiversity against illegal harvesting and trafficking of threatened species, poaching and destruction of habitats through human encroachment. Additionally, loss and degradation of forest ecosystems and water bodies within PAs will be prevented resulting to sequestration of carbon hence climate change mitigation. In summary, the project help protect and conserve globally significant biodiversity, aquatic and terrestrial ecosystems that lie within the PAs hence secure ecosystem goods and services necessary for achieving sustainable development and green growth.

G.   Innovation, sustainability and potential for scaling up:

35.   Over the past three years, the deployment of technology to improve protected area management effectiveness in Africa has been tested by various Reserves that are predominantly privately managed and thus, due to access to greater amounts and more flexible funding, have been able to incur the associated risk of expenditures on new and untested solutions. On a classic bell curve of uptake of new technologies, these Reserves have represented the

risk-taking "Innovators". Trajectory along this curve is now at the point of "Early Adoption" (which is when the risk of failure is low but the vision to see the potential remains extremely high but as yet not embraced by the majority of users). This is especially true for adoption by public sector entities.

36.   In terms of sustainability, this can be split into technical sustainability and financial sustainability. In terms of the former, the Earth Ranger software is a bespoke solution that has been engineered specifically for the conservation sector. It is therefore robust, user-friendly and able to absorb multiple data inputs as new sensor and tracking technologies emerge. Hence, the relevance of the software and its application is expected to endure for many years. In terms of the latter, this project will fund the capital expenditure required to equip the selected protected areas with the hardware required to achieve the desired outcomes. Other than the possibility of recurrent backhaul costs (which are normal for any remote field operation) and the salaries of control room operators, the technology deployed through this project will entail no other recurrent costs other than routine maintenance and upkeep. There are no large licensing or support fees involved.

37.   In terms of scaleability, this project will act as proof of concept within the public sector protected area management realm to demonstrate the considerable value-add of technology as a means to improve management effectiveness. This proof of concept is expected to promote and advance uptake of such technologies within the public sector. It is true that deployment entails capital costs that are unavoidable for each protected area and these will vary depending on the state of existing technologies and infrastructure. However, when deciding on how best to spend a limited budget, we anticipate that this project will convince decision makers that investment into tested, robust fit-for-purpose technologies can deliver a disproportionate return.

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https://www.theverge.com/2017/7/20/16002752/smart-park-rwanda-akagera-poaching-lorawan

[17] Global Environmental Benefits per GEF Focal Area: https://www.thegef.org/documents/global-environmental-benefits

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

38. Figure 1 provides a map of the project countries. A detailed map showing the location of the final list of Protected Areas in Botswana, Mozambique, and Republic of Congo will be provided during PPG Phase.

Figure 1: Map outlining the target countries (Botswana, Mozambique, and Republic of Congo)

Project countries

- Botswana
- Mozambique
- Republic of Congo

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities

Civil Society Organizations

Private Sector Entities

If none of the above,please explain why: Yes

31.   The partners and beneficiaries of this project are the public protected area management authorities in the target countries: Botswana, Mozambique and Republic of Congo. The relevant government Authorities in the target countries were consulted and their approval obtained before the Letters of Endorsement (LoEs) were signed by the GEF OFP.

32.   More stakeholders (CSOs, Private sector institutions) will be mapped and consulted during the PPG Phase.

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

1.   Table 6 below provides a template that will be used during PPG Phase to map stakeholders and identify their roles in the project.

Table 6:Stakeholder mapping per country

ENGAGEMENT			MAPPING STAKEHOLDERS			
			Government institutions	Civil Society Organizations (CSOs)	Private Sector	Others
WHO	1. Stakeholders	Who are the stakeholders and what is their role in the project?[15]	State PA Authorities in each target country (To be completed during PPG)	CSOs in the target countries working in the selected PAs (To be identified during PPG)	Private Sector institutions working in the selected PAs (To be identified during PPG)	
HOW	2. Level of Engagement (Tbd during PPG)	What level of engagement is required? e.g., consult, collaborate, empower, involve?	· Consult · Involve · Empower · Collaborate	• Consult • Involve • Empower • Collaborate	• Consult • Involve • Empower • Collaborate	
	3. Proposed method of engagement (Tbd during PPG)	What method of engagement will be used? e.g., workshops, interviews?	· Meetings · Workshops · Interviews · Capacity building · FGDs	· Meetings · Workshops · Interviews · Capacity building · FGDs	· Meetings · Workshops · Interviews · Capacity building · FGDs	

[15] The specific stakeholder per category will be identified during the PPG Phase

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

34.   The Convention on Biological Diversity (CBD) recognizes gender inequality as one of the key barriers of conservation and sustainable development. For instance, in 2014, Parties to the CBD adopted decision XII/17, which "*recognizes the importance of gender considerations to the achievement of the Aichi Biodiversity Targets.*'

35.   In conservation, gender inequality is observed in many ways such as: limited number of women in leadership positions, professional jobs, and in field positions such as rangers and protected area managers; few women formally employed in the law enforcement chain, especially focusing on anti-poaching; cases of sexual harassment and gender violence in and around protected areas; unequal distribution of land ownership and participation in decision-making regarding land use; limited or no women representation in community, and national level political decisions regarding natural resource utilization and climate change adaptation.

36.   Mainstreaming gender will contribute towards achieving the Sustainable Development Goals, especially in relation to gender equality and the empowerment of women. Additionally, mainstreaming gender during project development and implementation will strengthen project sustainability through improving quality of long-term planning and development of diverse approaches to conservation.

Indicative list of any activities that the project will undertake to support gender mainstreaming efforts in the design, implementation, and monitoring and evaluation of the project:

37.   Throughout the project the Executing Agency will ensure equitable representation and benefit sharing from project activities.

38.   Monitoring systems will include disaggregation by gender where appropriate to track different project roles and impacts throughout the life of the project.

39.   The project will mainstream gender through the following actions:

<u>PPG Phase:</u>

   1. A *Gender Mainstreaming Plan* will be developed during PPG Phase. The gender mainstreaming plan will have the following minimum gender indicators:

a)   Number of men and women that participated in project activities (e.g. meetings, workshops, consultations)

b)   Number of men and women that received benefits (e.g. employment, income generating activities, training, access to natural resources, equipment, leadership roles etc) from the project

c)   Number of strategies, plans (e.g. management plans and land use plans) and policies derived from the project that include gender considerations (where relevant)

   2. A *Stakeholder Engagement Plan (SEP)* will be developed, and it ensure involvement of all sub-groups of stakeholders within and around PAs including communities and potentially marginalized groups. The SEP will have the following minimum indicators:

a)   Number of government agencies, civil society organizations, private sector, indigenous peoples and other stakeholder groups that have been involved in the project implementation phase on an annual basis

b)   Number persons (sex disaggregated) that have been involved in project implementation phase (on a quarterly basis)

c)   Number of engagements (e.g. meeting, workshops, consultations) with stakeholders during the project implementation phase (on quarterly basis)

Implementation Phase:

1. Implementation, monitoring and quarterly reporting of the minimum gender indicators outlined in the Gender Mainstreaming Plan

2. Implementation, monitoring and quarterly reporting of the minimum indicators outlined in the Stakeholder Engagement Plan (SEP)

3. The project will prioritize selection of female staff as control room operators during project
4. Advocate for inclusion of female scout and ranger staff

Project's expected contribution to gender equality and women's empowerment:

1. It is anticipated that the project will increase women's involvement in Protected Area management by prioritizing selection of female staff as control room operators.
2. Additionally, during meetings and project functions, the project will ensure women are represented and given an opportunity to contribute to discussions and decision making.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources;

improving women's participation and decision-making; and/or Yes

generating socio-economic benefits or services for women.

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

40.   Vulcan Inc. is a private sector institution. Vulcan Inc. built the EarthRanger software to meet the unique needs of protected area managers. With technical and financial (US$2 million) support from Vulcan Inc., this project will deploy EarthRanger software in the selected PAs.

41.   In certain of the protected areas selected, it is possible that private sector institutions and conservation NGOs may already be providing technical and/or financial support or be participating in a form of co-management with the public protected area management authority. In such cases, it is possible that these private sector institutions and NGOs may be involved in the implementation of the project and/or post-implementation use of the information/data. Until such time as the specific protected areas have been selected in consultation with the relevant authorities, it is not possible to identify other potential private sector entities.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Corona Virus Pandemic (COVID19):

The project recognises that the Corona Virus Pandemic (COVID19) may cause delays and/or slow down implementation of project activities such as: delays to set-up the project; delays to recruit project staff; delay/long periods before the imported Earth Ranger software and hardware arrive in the target countries and low stakeholder engagement/ turn out. Additionally, since the project is implemented in PAs, there is risk that project staff may infect wild animals (especially primates) with COVID19 during project implementation.

In-order to mitigate the risks outlined above, the project proposes the following mitigation measures: (a) The project will prepare and implement relevant safeguard plans which will clearly indicate activities being put in place to address risks triggered by COVID19. These safeguards include: Labor and Working Conditions; Community Health, Safety and Security; Accountability and Grievance Mechanism and a Stakeholder Engagement Plan; (b) The project team will prepare and submit quarterly technical and Financial reports to CIGEF. The reports will clearly indicate project implementation progress, any delays and adaptive measures being put in place by project teams. This will enable the Agency to provide guidance on how best to adapt to the situation on the ground from a technical and financial perspective.; (c) The project team will develop and implement the project's Adaptive Management Plan to the COVID19 situation. This plan will also provide activities that will be implemented by project managers (leads) to ensure their teams deliver selected project activities while working remotely; (d) During implementation phase, the project budget will cover recurrent costs for purchasing hand sanitisers, face masks, gloves etc for project staff.; and (e) The project will create a COVID19 repository and prepare a communication strategy for disseminating information related to COVID19 with project teams and stakeholders. This will also entail communicating to stakeholders the impact COVID19 will have on the project and the adaptive measures that will be put in place by the project.

Table 16: Risks and Mitigation Planning

Risks	Rating (High (H), Substantial (S), Modest (M) Low (L))	Risk Mitigation Measures
1. Earth Ranger Control Room and softw are affected by climate change and variabili ty (heavy rains and/or high atmospheric te mperature) and rodents.	High	· Procurement and installation of climate proof equipment and technology · Necessary measures will be put in place to prevent rodents e.g., pesticides, r outine cleaning of the control rooms etc. · A room will be identified during implementation phase where salvaged hardw are can be moved in-case the control room is damaged.

			are can be moved in case the control room is damaged.
2. Wildlife crime in the protected areas	High	· Installation of the Earth Ranger (ER) Technology and build capacity of PA management staff to utilize the ER technology to monitor park boundaries, movement patterns of rangers and wildlife, enable rangers to communicate with each other over radio transmitters, enable the PA management team to maintain reports in a more organized way hence ensure that planning is based on the most complete set of data available. · EarthRanger generally improves the safety of rangers by making sure that their activities are coordinated and that situations such as ranger on ranger fire is avoided.
3. Lack of security of the Earth ranger hardware in the control Rooms	High	· Only designated personnel will have access to the control rooms · Only designated personnel will have keys to the control room
4. High turn-over of trained staff	High	· Identification of a technology champion in each selected protected area
5. Data Management risks	High	The project will build on existing systems and enhance them to ensure that the data is sent to central repository following a systematic channel and at each level, a copy of the data is retained (to avoid losing data)
6. Lack of electricity to power the control room	Modest	One of the criteria of identifying the target PAs is, the PA should have access to electricity. Backup power supply, such as a generator, will be included in the equipment included in the funding should none currently exist at a site.
7. Social and Environmental impacts of installing radio and LoRa towers	High	· Safeguards screening will be undertaken to identify the safeguards triggered by this project · For all the safeguards triggered by this project, a subsequent **Environmental safeguard plan** will be developed and implemented to ensure potential adverse environmental and social impacts are avoided, minimized, mitigated/compensated
8. Inability to maintain proper functioning of technology	High	· ToTs to be identified in each PA · Develop a project exit strategy and action plan · Inclusion of at least a three year maintenance plan or service level agreement (SLA) for the hardware installed in each PA.
9. Expert retention risks	High	· The project will undertake a Training of Trainers (ToTs). ToTs to be identified i

		n each PA

The CI-GEF Safeguards Analysis has been uploaded as a separate attachment.

*The risks and proposed mitigation measures will be updated during PPG Phase

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

1.   Institutional structure of the project/Project Management:

Project Duration: The project duration is **45 months**. We anticipate that project set-up will take approximately 6 months, actual implementation will take 36 months and Project close-out and handover will take 3 Months.Terminal Evaluation will commence after the 45 months elapse.

I*mplementing Agency - Conservation International-GEF (CI-GEF):* The roles of the CI-GEF Implementing Agency include technical and financial project oversight and supervision, assuring compliance of projects with GEF Policies and Procedures, and monitoring and evaluation. The CI-GEF Project Agency will undertake as follows:

1.   *Quarterly technical and Financial progress reports:* Regarding reporting, quarterly technical and financial progress reports will be submitted to the CI-GEF Implementing Agency by the Executing Agency.

2.   *Annual Project Implementation Reports (PIR):* The Executing Agency will prepare and submit an annual PIR which will be submitted to the GEF by the CI-GEF Implementing Agency

3.   *Annual Supervision Visit:* The CI-GEF Implementing Agency will undertake an annual supervision mission to assess implementation progress against achieving the project's goals and results and put forth recommendations that will improve implementation of the project's future activities.

Executing Agency (EA) - Vulcan Inc.: Vulcan Inc. will act as the Executing Agency (EA) and will be responsible for overall project management and execution during the Implementation Phase. Partners on the ground who will support the selected EA are government agencies in the target countries, selected NGOs that co-manage or provide support to the selected PAs, and technology service providers. Once the protected areas have been selected, Vulcan will work with CI-GEF and CI's Africa Field Division to define and describe roles of organizations involved in this project and the project management structure.

Project Partners: The Executing Agency will work closely with the following key project partners:

1. *Conservation International -* Africa Field Division will provide relationship management input with Governments as well as technical and project expertise to Vulcan. It is proposed that the PMU will be based in CI-South Africa office but will report to Vulcan Inc. (as part of CI's co-financing). This arrangement will be discussed in detail during the PPG based.
2. *The State Protected Area Authorities* (identified in each target country)
3. *Other partners* (CSO, Private sector institutions etc) - *To be identified during PPG*

* *In the PPG Phase, a Terms of Reference (ToRs) will be prepared detailing the role of each partner organization during project implementation.*

A Project Management Unit (PMU): A Project Management Unit (PMU) comprising of **three (3) personnel** listed below will be established. The ToRs of the proposed project staff will be developed during PPG Phase.

a)   Project Manager

b)   Conservation specialist (with experience in Protected Area management)
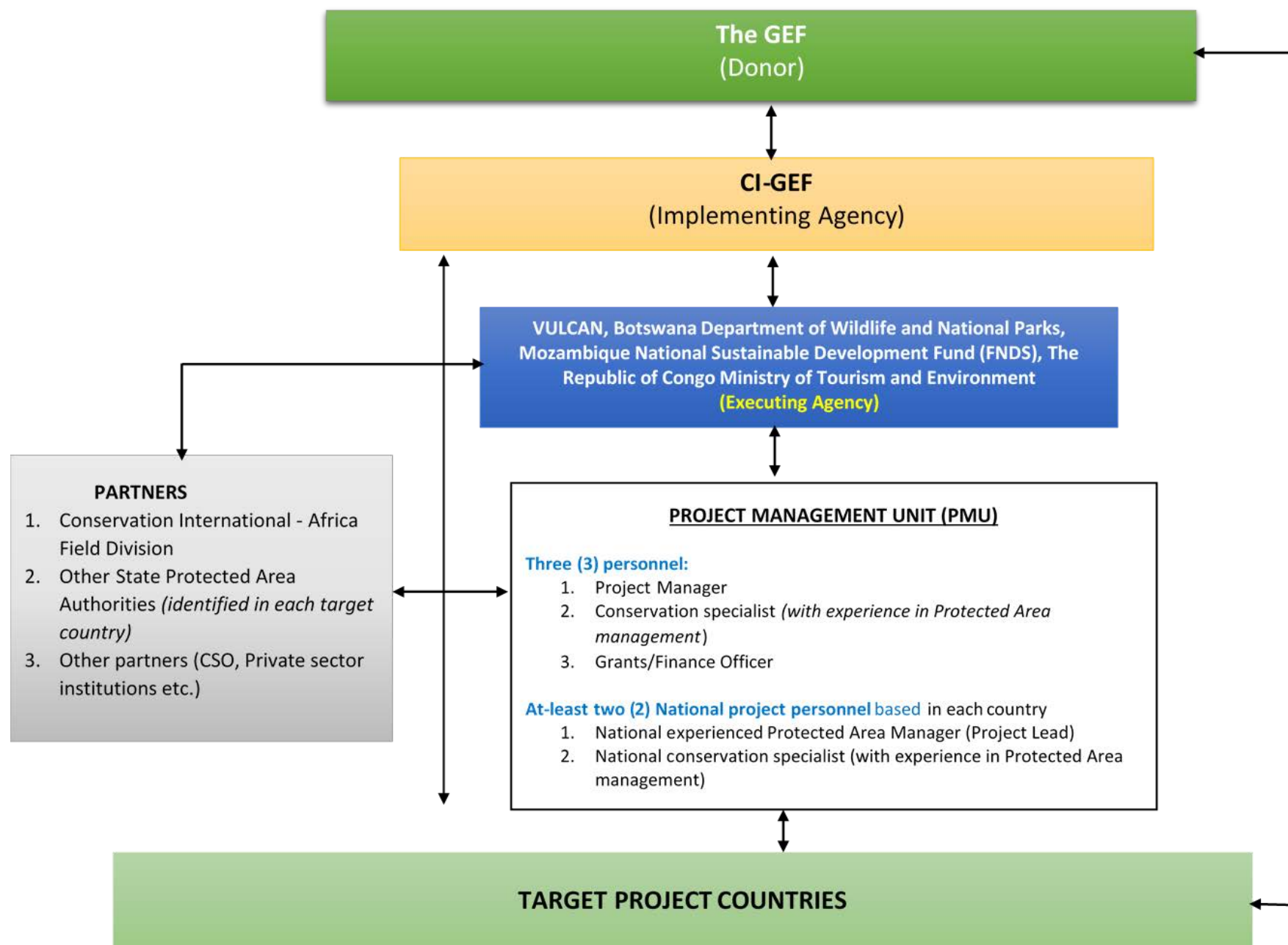
c)   Grants/Finance Officer

It is proposed that the PMU will be based in CI-Africa Field Division office (as part of CI's co-financing) but will report to Vulcan Inc. This arrangement will be discussed in detail during the PPG Phase.

 The PMU team will be supported by at-least two (2) *National Project staff per country*. During PPG Phase, the state PAs Authority in the target countries will advise where the national project staff will be based). The ToRs of the proposed national project staff will be developed during PPG Phase.

a)   National experienced Protected Area Manager (Project Lead)

b)   National conservation specialist (with experience in Protected Area management)

The Project's Execution Arrangement is summarized Figure 2. This may be updated during the PPG Phase.

FIGURE 2: THE PROJECT'S EXECUTION ARRANGEMENT

1. <u>Monitoring and evaluation coordination at the project level.</u>

Monitoring and evaluation (M&E) roles and responsibilities:

- The *Project Management Unit* on the ground will be responsible for initiating and organizing key monitoring and evaluation tasks. This includes the project inception workshop and report, quarterly progress reporting, annual progress and implementation reporting, documentation of lessons learned, and support for and cooperation with the independent external evaluation exercises.

- The *Project Executing Agency* is responsible for ensuring the monitoring and evaluation activities are carried out in a timely and comprehensive manner, and for initiating key monitoring and evaluation activities, such as the independent evaluation exercises. Key project executing partners are responsible for providing any and all required information and data necessary for timely and comprehensive project reporting, including results and financial data, as necessary and appropriate.

- The *CI-GEF Project Agency* plays an overall assurance, backstopping, and oversight role with respect to monitoring and evaluation of activities.

- The *CI General Consel's* function is responsible for contracting and oversight of the planned independent external terminal evaluation.

Monitoring and evaluation (M&E) Components and activities:

- **PPG Phase:** During PPG Phase, a *Project Results Monitoring Plan* will be developed. The M&E Plan will include objective, outcome and output indicators, metrics to be collected for each indicator, methodology for data collection and analysis, baseline information, location of data gathering, frequency of data collection, responsible parties, and indicative resources needed to complete the plan.

- **Implementation phase:** During Implementation phase, the following will be undertaken:

a. <u>Inception workshop</u>
Project inception workshop will be held within the first three months of project start with the project stakeholders. An overarching objective of the inception workshop is to assist the project team in understanding and taking ownership of the project's objectives and outcomes. The inception workshop will be used to detail the roles, support services and complementary responsibilities of the CI-GEF Project Agency and the Executing Agency.

b. <u>Inception workshop Report</u>
The Executing Agency (PMU)should produce an inception report documenting all changes and decisions made during the inception workshop to the project planned activities, budget, results framework, and any other key aspects of the project.

c. Track the <u>Project Results Monitoring Plan</u>

d. <u>GEF Core Indicators</u>
The relevant GEF Core Indicators will also be completed i) prior to project start-up, ii) prior to mid-term review, and iii) at the time of the terminal evaluation.

e. <u>CI-GEF Project Agency (PA) Field Supervision Missions</u>
The CI-GEF PA will conduct annual visits to the project country based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first-hand project progress. A Field Visit Report will be prepared by the CI-GEF staff participating in the oversight mission.

f.   Quarterly Progress Reporting

The Executing Agency will submit quarterly progress reports to the CI-GEF Project Agency, including a budget follow-up and requests for disbursement to cover expected quarterly expenditures.

g.   Annual Project Implementation Report (PIR)

The Executing Agency will prepare an annual PIR to monitor progress made since project start and for the reporting period (July 1st to June 30th). The PIR will summarize the annual project result and progress

h.   Final Project Report

The Executing Agency will draft a final report at the end of the project.

i.   Independent Terminal Evaluation

An independent Terminal Evaluation will take place within six months after project completion and will be undertaken in accordance with CI and GEF guidance. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place).

j.   Lessons Learned and Knowledge Generation

Results from the project will be disseminated within and beyond the project intervention area through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. There will be a two-way flow of information between this project and other projects of a similar focus.

k.   Financial Statements Audit

Annual Financial reports submitted by the Executing Agency will be audited annually by external auditors appointed by the Executing Agency.

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assesments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

44.   This project is consistent with and supportive of several regional and global environmental agreements related to biodiversity conservation and management of Protected areas. Below is an overview:

-      Convention on Biological Diversity (CBD): The Convention has three main goals namely: conservation of biodiversity; sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. The Earth Ranger Project will strengthen institutional and capacity of the PA Authorities to effectively manage the PAs hence conserve biodiversity and promote socio-economic development, human wellbeing and ecological integrity. All the Target countries (Botswana, Mozambique and the Republic of Congo) are party to the CBD and have developed their National Biodiversity Strategy and Action Plans (NBSAPs) as part of their commitment to the Convention. Each country's NBSAPs Vision is provided in the table below:

Table 8: Vision of each Target Country's NBSAP

COUNTRY	VISION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN (NBSAP)
Botswana	Botswana, by 2025, ecosystem, species and genetic diversity is valued, protected, and used sustainably and equitably, through the involvement of all sectors of society and the provision of sufficient resources for its sound management (Botswana DEA, 2016[1]).
Mozambique	Mozambique, by 2035, the ecological, socio-economic and cultural value of biodiversity in Mozambique will contribute directly to improving the quality of life of Mozambicans, derived from its integrated management, conservation and fair and equitable utilization (Ministry of Land, Environment and Rural Development, 2015[2]).
Republic of Congo (RoC)	Republic of Congo (RoC), by 2030, the security of Congo's biological resources is ensured by better knowledge of their components and sustainable management that integrate capacity development human, socio-economic development, redistribution equitable benefits while honoring commitments International (Ministre du Tourisme et de l'Environnement, 2015[3]).

-        <u>The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization</u> was adopted by the Parties to the Convention on Biological Diversity (CBD). All the Target countries (Botswana, Mozambique, Republic of Congo) are party to the CBD and the Nagoya Protocol[4]. The Nagoya protocol seeks to promote fair and equitable sharing of benefits arising from utilization of genetic resources.

-        <u>African Convention on the Conservation of Nature and Natural Resources</u>[5]: All the Target countries (Botswana, Mozambique, Republic of Congo) are party to this convention[6]. The objective of this convention is: to adopt the measures necessary to ensure conservation, utilization and development of soil, water, flora and faunal resources in accordance with scientific principles and with due regard to the best interests of the people. This convention recognizes the vital importance of natural resources, e.g., flora, fauna, water and soil, to the well-being of African populations.

-        <u>Convention on International Trade in Endangered Species (CITES):</u> All the Target countries (Botswana, Mozambique, Republic of Congo) are party to CITES[7]. This convention recognizes that various species, animals and plants represent an irreplaceable part of natural ecosystems. The objective CITES is to ensure that international trade in threatened animals and plant species does not threaten their survival.

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-        <u>Ramsar Convention</u> seeks to protect wetlands as important ecosystems for the maintenance of biodiversity. This convention recognizes the ecological importance of wetlands as regulators of hydrological regimes and habitats of specific flora and fauna species. All the Target countries (Botswana, Mozambique, Republic of Congo) are party to the Ramsar convention[8].

-        <u>United Nations Framework Convention on Climate Change (UNFCCC):</u> This convention seeks to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. It recognizes the elevated natural greenhouse effect, caused by human activities, and evaluates the extent they affect adversely the natural ecosystems and humankind; also recognizes the role of terrestrial and marine ecosystems as carbon sinks. All the Target countries (Botswana, Mozambique, Republic of Congo) are party to the UNFCCC and other key climate change conventions namely: **The Kyoto Protocol and The Paris Agreement**[9].

-        <u>United Nations Convention to Combat Desertification (UNCCD)</u> seeks to combat desertification and strive to mitigate the effects of drought in countries undergoing serious drought and/or desertification, particularly in Africa. The UNCCD recognizes that desertification is caused by complex interactions among physical, biological, political, socioeconomic and cultural factors. All the Target countries (Botswana, Mozambique, Republic of Congo) are party to the UNCCD[10].

-        <u>Cartagena Protocol on Biosafety:</u> Establishes mechanisms to protect biodiversity and human health risks of Genetically Modified Organisms (GMOs). This Convention seeks to contribute to ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity. All the Target countries (Botswana, Mozambique, Gabon, Republic of Congo) are party to the Cartagena Protocol on Biosafety[11].

-        <u>Bonn Convention on Migratory Species (CMS):</u> Recognizes the importance of conservation of special habitats of migratory species. All the Target countries (Botswana, Mozambique, Republic of Congo) are party to the CMS[12].

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[4] List of countries party to the Nagoya Protocol: https://www.cbd.int/abs/nagoya-protocol/signatories/

[5] African Union. (2003). African Convention on the Conservation of Nature and Natural Resources (revised). Addis Ababa, Ethiopia. Retrieved from
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[6] African Union. List of countries party to the African Convention on the Conservation of Nature and Natural Resources:
https://web.archive.org/web/20120902043558/http://www.africa-
union.org/root/au/Documents/Treaties/List/African%20Convention%20on%20nature%20and%20natural%20resources.pdf

[7] List of countries party to CITES: https://www.cites.org/eng/disc/parties/chronolo.php

[8] List of countries party to Ramsar Convention: https://www.ramsar.org/country-profiles

[9] List of countries party to UNFCCC, Kyoto Protocol and the Paris Agreement: https://unfccc.int/process/parties-non-party-stakeholders/parties-convention-
and-observer-states?
field_national_communications_target_id%5B514%5D=514&field_partys_partyto_target_id%5B512%5D=512&field_partys_partyto_target_id%5B511%5D=511

[10] List of countries party to UNCCD: https://knowledge.unccd.int/search?f%5B0%5D=type%3Afocal_points

[11] List of countries party to the Cartagena Protocol on Biosafety: https://bch.cbd.int/protocol/parties/

[12] List of countries party to the Bonn Convention on Migratory Species (CMS): https://www.cms.int/en/parties-range-states

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

45.   The key knowledge management activities under this project will involve: Hands-on Trainings on Earth Ranger Technology; sharing of project's lessons and success stories through supporting exposure site visits by other countries to selected PAs and dissemination of information through various modes of communication.

46.   Success stories and lessons learnt from this project will be disseminated through the Earth Ranger Website (https://earthranger.com/About-Us.aspx) and other media outlets and social media platforms that will be identified during the PPG Phase.

47.   It is anticipated that through widespread dissemination of Earth ranger's success stories, other African countries will gain interest to install and use conservation Technologies to manage their PAs.

48.   Regarding storage of data, the project will build on existing systems and enhance them to ensure that the data is sent to central repository following a systematic channel and at each level, a copy of the data will be retained as back-up.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Botshabelo Othusitse	Deputy Director GEF Operational Focal Point	Department of Environmental Affairs	2/17/2020
Momede Abdurramane Nemane	Chairperson of the Board, GEF Operational Focal Point	Fundo Nacional de Desenvolvimento Sustentavel	3/19/2020
Arlette Suodan-Nonault	Minister of Tourism and Environment	Ministry of Tourism and the Environment	3/3/2020

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

Figure 1 provides a map of the project countries

A detailed map showing the location of the final list of Protected Areas in Botswana, Mozambique, and Republic of Congo will be provided during PPG Phase.

Project countries

- Botswana
- Mozambique
- Republic of Congo