



## **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 No**

**NGI No**

#### **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)**

The Allen Institute for Artificial Intelligence (AI2), The Botswana Department of Wildlife and National Parks: The Ministry of Environment, Natural Resources Conservation and Tourism, The Mozambique National Sustainable Development Fund (FNDS): The Ministry of Land and Environment, The Republic of Congo, Ministry of Tourism and Environment, African Parks, No?, Peace Parks Foundation (PPF), Wildlife Conservation Society (WCS)

#### **Executing Partner Type**

Others

#### **GEF Focal Area**

Biodiversity

**Taxonomy**

Focal Areas, Biodiversity, Protected Areas and Landscapes, Terrestrial Protected Areas, Species, Threatened Species, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approaches, Stakeholders, Civil Society, Non-Governmental Organization, Community Based Organization, Private Sector, Large corporations, SMEs, Individuals/Entrepreneurs, Communications, Education, Awareness Raising, Type of Engagement, Information Dissemination, Partnership, Participation, Consultation, Gender Equality, Gender Mainstreaming, Gender-sensitive indicators, Beneficiaries, Sex-disaggregated indicators, Gender results areas, Participation and leadership, Capacity Development, Access to benefits and services, Knowledge Generation and Exchange, Capacity, Knowledge and Research, Knowledge Generation, Innovation, Learning

**Sector**

**Rio Markers**

**Climate Change Mitigation**

Climate Change Mitigation 0

**Climate Change Adaptation**

Climate Change Adaptation 0

**Submission Date**

1/27/2022

**Expected Implementation Start**

7/1/2022

**Expected Completion Date**

3/1/2026

**Duration**

45In Months

**Agency Fee(\$)**

216,609.00

**A. FOCAL/NON-FOCAL AREA ELEMENTS**

<b>Objectives/Programs</b>	<b>Focal Area Outcomes</b>	<b>Trust Fund</b>	<b>GEF Amount(\$)</b>	<b>Co-Fin Amount(\$)</b>
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	GET	2,407,360.00	4,801,400.00
<b>Total Project Cost(\$)</b>			<b>2,407,360.00</b>	<b>4,801,400.00</b>

## **B. Project description summary**

### **Project Objective**

To strengthen management effectiveness of priority Protected Areas (PAs) in Africa to deliver global environmental benefits through the deployment of the EarthRanger protected area management system and related technologies.

<b>Project Component</b>	<b>Financing Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>GEF Project Financing(\$)</b>	<b>Confirmed Co-Financing(\$)</b>
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Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 1: Installation of EarthRanger software together with other required technologies and infrastructure to achieve EarthRanger readiness	Technical Assistance	<p><b>Outcome 1.1:</b> Strengthened institutional and technical capacity of participating countries to effectively manage protected areas</p> <p><i>Outcome Indicator 1.1:</i> Hectares of protected areas with improved Management Effectiveness Tracking Tool (METT) score</p> <p><i>Target 1.1:</i> At least 4,901,650 hectares of protected areas with improved METT scores</p> <p><i>Outcome Indicator 1.2:</i> Number of protected areas in the participating countries utilizing EarthRanger technology to manage the PAs</p>	<p><b>Output 1.1.1:</b> Earth Ranger software incorporated in the existing PA management structure in the target countries</p> <p><b>Output 1.1.2:</b> A dedicated, secure, and functional control room facility established to be used by management to improve real-time situational awareness through the deployment of EarthRanger technology in each PA in the target countries</p> <p><b>Output 1.1.3:</b> Required built infrastructure and internet network capabilities installed in the selected protected areas in the target countries</p> <p><b>Output 1.1.4:</b> Digital radio or other appropriate</p>	GET	1,847,506.00	1,920,560.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 2: Learning, knowledge sharing and scaling the EarthRanger technology across Africa	Technical Assistance	<p><b>Outcome 2.1:</b> Additional PAs in Africa are identified and the respective Countries commit to install the EarthRanger technology.</p> <p><i>Outcome Indicator 2.1:</i></p> <p>Number of additional PAs identified, and number of African countries committed to install the EarthRanger software and other technologies (GEF8 LoEs, Co-financing pledges)</p> <p><i>Target 2.1:</i> At least 6 new PAs identified, and 3 African countries committed to install Earth Ranger Technology in GEF8</p>	<p><b>Output 2.1.1:</b> Annual learning and knowledge sharing event (EarthRanger User Conference) undertaken by each PA</p> <p><b>Output 2.1.2:</b> Information sharing events undertaken to enhance learning and promote scaling up</p> <p><b>Output 2.1.3:</b> Success stories, lessons learnt and best practices published and shared on blogs, websites, and other digital platforms (where the EarthRanger software has informed decisions in the management of protected areas).</p>	GET	331,382.00	2,163,635.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
Component 3: Monitoring and Evaluation	Technical Assistance	<p><b>Outcome 3.1:</b> An integrated monitoring and evaluation framework for the project</p> <p><i>Outcome Indicator 3.1:</i> Number of M&amp;E reports submitted to the CIGEF Agency for review and approval, and the Number of Evaluations conducted by CIGEF.</p> <p><i>Target 3.1:</i> Periodic technical and financial reports submitted to CIGEF for review and approval: <i>At least 3 Annual Workplans and Budget, 12 Quarterly Reports, 3 Annual Progress Implementation Reports (PIRs)</i></p> <p><i>Target 3.2:</i> At least 2 Evaluations</p>	<p><b>Output 3.1.1:</b> Periodic M&amp;E reports submitted to the CIGEF Agency</p> <p><b>Output 3.1.2:</b> Mid-Term Evaluation and Terminal Evaluation conducted by CIGEF</p>	GET	114,236.00	480,140.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
				<b>Sub Total (\$)</b>	<b>2,293,124.00</b>	<b>4,564,335.00</b>
<b>Project Management Cost (PMC)</b>						
		GET		114,236.00		237,065.00
		<b>Sub Total(\$)</b>		<b>114,236.00</b>		<b>237,065.00</b>
		<b>Total Project Cost(\$)</b>		<b>2,407,360.00</b>		<b>4,801,400.00</b>

Please provide justification

**C. Sources of Co-financing for the Project by name and by type**

<b>Sources of Co-financing</b>	<b>Name of Co-financier</b>	<b>Type of Co-financing</b>	<b>Investment Mobilized</b>	<b>Amount(\$)</b>
GEF Agency	Conservation International	In-kind	Recurrent expenditures	25,000.00
Private Sector	The Allen Institute for Artificial Intelligence (AI2)	Grant	Investment mobilized	2,000,000.00
Recipient Country Government	The Botswana Ministry of Environment, Wildlife, and Tourism (Department of Wildlife and National Parks)	In-kind	Recurrent expenditures	250,000.00
Civil Society Organization	Peace Parks Foundation (PPF) in Mozambique	In-kind	Recurrent expenditures	870,000.00
Civil Society Organization	No? in the Republic of Congo	In-kind	Recurrent expenditures	194,400.00
Civil Society Organization	Wildlife Conservation Society (WCS) in the Republic of Congo	Grant	Investment mobilized	130,000.00
Civil Society Organization	African Parks in the Republic of Congo	In-kind	Recurrent expenditures	486,000.00
Private Sector	The Allen Institute for Artificial Intelligence (AI2)	In-kind	Recurrent expenditures	746,000.00
Recipient Country Government	The Botswana Ministry of Environment, Wildlife, and Tourism (Department of Wildlife and National Parks)	Grant	Investment mobilized	100,000.00
<b>Total Co-Financing(\$)</b>				<b>4,801,400.00</b>

**Describe how any "Investment Mobilized" was identified**

Investment mobilized was identified as new and available funding with a specific scope of work and a timeframe, which will contribute to the overall goal of this project. The key partners identified in the design of the project have a history of developing conservation technology, building the capacity of state and non-state partners to adopt and utilize conservation technology, investing heavily in the deployment of conservation technologies (including Earth Ranger Technology) in various African countries and utilizing the conservation technologies to manage the protected areas. These key partner attributes are in line with

this project's objectives. The investment mobilized co-financing are leveraged resources based on engagement with partners and collaborators. This includes co-financing from The Allen Institute for Artificial Intelligence (AI2), The Botswana Ministry of Environment, Wildlife and Tourism (Department of Wildlife and National Parks) and The Wildlife Conservation Society (WCS). The investment mobilized co-financing is in form of grants. All the investments have been confirmed and co-finance letters obtained. Change in Executing Agency (EA) from Vulcan Inc. to The Allen Institute for Artificial Intelligence (AI2). The EarthRanger Technology was developed by Vulcan Inc. in partnership with several conservation and technology partners. AI2 is not within Vulcan, but a separate organisation. AI2 is one of Paul Allen's stable organisations, but is separate from Vulcan, and is a different entity type. As of September 2021, EarthRanger Unit was moved to AI2 from Vulcan. AI2 has signed the co-financing letter and will uphold the commitments made by Vulcan Inc. to the GEF at PIF stage and CEO Endorsement.

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

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
CI	GET	Regional	Biodiversity	BD Global/Regional Set-Aside	1,344,202	120,978	1,465,180.00
CI	GET	Botswana	Biodiversity	BD STAR Allocation	616,442	55,427	671,869.00
CI	GET	Congo	Biodiversity	BD STAR Allocation	446,716	40,204	486,920.00
<b>Total Grant Resources(\$)</b>					<b>2,407,360.00</b>	<b>216,609.00</b>	<b>2,623,969.00</b>

**E. Non Grant Instrument**

NON-GRANT INSTRUMENT at CEO Endorsement

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Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

**F. Project Preparation Grant (PPG)**

PPG Required **true**

**PPG Amount (\$)**

69,705

**PPG Agency Fee (\$)**

6,273

<b>Agency</b>	<b>Trust Fund</b>	<b>Country</b>	<b>Focal Area</b>	<b>Programming of Funds</b>	<b>Amount(\$)</b>	<b>Fee(\$)</b>	<b>Total(\$)</b>
CI	GET	Regional	Biodiversity	BD Global/Regional Set-Aside	31,945	2,875	<b>34,820.00</b>
CI	GET	Botswana	Biodiversity	BD STAR Allocation	25,760	2,318	<b>28,078.00</b>
CI	GET	Congo	Biodiversity	BD STAR Allocation	12,000	1,080	<b>13,080.00</b>
<b>Total Project Costs(\$)</b>					<b>69,705.00</b>	<b>6,273.00</b>	<b>75,978.00</b>

## 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	4,901,650.00	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)
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**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	4,901,650.00	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)
Akula National Park Odzala-Kokoua	125689 643	Select National Park		1,354,600.00			81.00		

Name of the Protected Area	WD PA 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)
Akula National Park Zinave	125 689 903 5	Select National Park		412,100.00			54.00		
Akula National Park Chobe	125 689 600	Select Wilderness Area		1,100,000.00			72.00		
Akula National Park Conkouati-Douli	125 689 109 018	Select Others		504,950.00			44.00		
Akula National Park Limpopo	125 689 202 95	Select National Park		1,115,000.00			59.00		
Akula National Park Nouabal? - Ndoki	125 689 723 32	Select National Park	2,115,200.00	415,000.00			72.00		

**Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment**

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female		24		
Male		138		
<b>Total</b>	0	162	0	0

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

## Part II. Project Justification

### 1a. Project Description

#### Changes from the PIF

The key changes from the PIF are summarized below and detailed Tables showing specific sections in the PIF that were modified are provided in Appendix XIV.

1. Change in Executing Agency (EA) from Vulcan Inc. to The Allen Institute for Artificial Intelligence (AI2). The EarthRanger Technology was developed by Vulcan Inc. in partnership with several conservation and technology partners. As of September 2021, EarthRanger became part of AI2. This move combines world-class research, engineering, product resources, and talent to create a greater positive impact, as envisioned by the late Paul G. Allen. AI2 will uphold the commitment made by Vulcan Inc. to the GEF at CEO Endorsement. The change in EA will only affect the holding entity, but all personnel and other resources committed at CEO Endorsement remain intact.

2. The project design has been updated as follows:

a. One new component has been added in order to have clear outputs, outcomes, and budget lines for Monitoring Evaluation. The Component is:

? Component 3: Monitoring and Evaluation

b. Changes in outputs and outcomes: Some outputs, outcomes, indicators, and targets have been added, rephrased, edited, or deleted. Refer to the detailed table in Appendix XIV

c. A Theory of Change has been added. Refer to section 2 (part H).

3. The Target project sites/protected areas have been identified. This project will be executed in six (6) protected areas, namely:

? Botswana: Chobe National Park

? Mozambique: Limpopo National Park and Zinave National Park

? Republic of Congo: Nouabal?-Ndoki National Park; Odzala-Kokoua National Park; Conkouati-Douli National Park

4. The target total number of Hectares (Ha) of terrestrial protected areas that will be under improved management for conservation and sustainable use has increased from 2.1 Million Ha to 4.9 Million Ha. Refer to the core indicator table.

5. The target number of direct beneficiaries has been established: 162 direct beneficiaries (Men: 85% women: 15%). This number was estimated based on existing rangers at the parks. Generally, there are few women rangers in the parks however, the project will put measures to involve more women. The measures are described in the Gender Mainstreaming Plan (GMP).

6. Four new in-country project co-executing partners have been identified and they have also committed co-financing. These partners are; The Peace Parks Foundation (Mozambique), the Wildlife Conservation Society (WCS) (Republic of Congo), African Parks (Republic of Congo), and No? (Republic of Congo).

7. The co-financing amount has increased by 47%. Specifically, the amount has increased from US\$ 2.5 Million to US\$ 4.8 Million. Refer to Table 21.

1) The global environmental and/or adaptation problems, root causes and barriers to be addressed

**Global Environmental Problems and Root Causes**

There is immense pressure on natural resources, including on the biodiversity in protected areas in the project participating countries resulting from a combination of proximate and underlying factors that manifest in different ways. The most critical pressures are poaching, timber harvesting, agricultural land expansion, and urbanization that affect biodiversity and ecosystem services. Land-use change and unsustainable resource use destroy biological resources as habitats are degraded and ecosystems are converted to other uses. Invasive species, climate change, and mining developments also pose significant threats to the ecosystems, curtail environmental services, and reduce biodiversity.

There are major root causes of environmental problems that affect protected area management and lead to ecosystem degradation and biodiversity loss in the project participating countries include inadequate institutional capacity for effective management, human population growth, and the associated anthropogenic activities, escalating poverty, and limited livelihood options. Other causes of environmental degradation are high demands for natural resources due to population movements linked to conflicts and civil war, use of fire for pest management, bush clearing, and vegetation regeneration for livestock grazing.

Drivers and causes of biodiversity loss in the project participating countries are summarized in

Table 1

**Table 1: Status and trends of biodiversity and threats in the target countries**

Country	Status and trends of biodiversity and threats
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Country	Status and trends of biodiversity and threats
<b>Botswana</b>	<p>In the Okavango Delta, climate change is a major threat to biodiversity, hydrology, and river water quality. As the country's economy is supported by wildlife-based tourism, climate change is likely to affect wildlife habitats in the protected areas through a change in vegetation cover and composition, water availability, species diversity, and richness. The adverse environmental effects will have a knock-on effect on agricultural production and wildlife-based tourism. The Government of Botswana has embarked on efforts to mitigate the risks and hazards of climate change impacts by mainstreaming strategies in the national economic planning and development frameworks.</p> <p>The major environmental problems in Botswana are drought and desertification. Desertification predominantly stems from severe drought exacerbated by climate change. The country experiences long drought periods, a decline in subsistence agriculture, and increased rural household poverty. The main threats to biodiversity include habitat destruction, conversion, and disturbance, restricted wildlife movement, high populations of elephants that degrades the environment, increase in poaching of flagship species such as Rhino and elephants, frequent natural fires, and unsustainable use of wild plant species.</p> <p>Threat from invasive species is still relatively low although, in the southwest of the country, <i>Prosopis glandulosa</i> is problematic while in the Okavango Delta <i>Salvinia molesta</i> affects the aquatic ecosystems. The Indian Myna (<i>Acridotheres tristis</i>) is common in Gaborone although little is known about its impacts on the environment.</p> <p>Of the seven main eco-regions in Botswana, four are vulnerable. The South African Bushveld is threatened by deforestation, unregulated cattle grazing, range degradation, and uncontrolled veldt fires. Cattle grazing has degraded and changed the Zambebian Baikiaea woodlands while Zambebian Halophytics are threatened by mining, rangeland degradation, bushfires, wind erosion, increased irrigation water extraction, disruption of wildlife migration routes by fencing, overgrazing, lack of protection for the avian breeding sites, and uncontrolled tourism activities. Poaching is a major threat to wildlife conservation in Botswana.</p>

Country	Status and trends of biodiversity and threats
<b>Mozambique</b>	<p>Major threats to biodiversity are human population increase, urban development, past political instability, and civil war which exacerbated habitat loss and fragmentation, the decline in the number, and change in the distribution of large terrestrial mammals in the protected landscapes. The main threats to fauna are hunting, (mainly on foot and by snares in Limpopo and big game poaching in Zinave)[2]<sup>1</sup>, uncontrolled fires, and destruction of habitats, while the main threats to flora are clearing as part of slash-and-burn agriculture practice, increased human settlement and uncontrolled fires. The main threats to mangrove forests are deforestation, aquaculture, and the construction of salt pans. Coral reefs are affected by coral bleaching, increased fishing and tourism activities. Seagrasses are threatened by siltation due to floods, revolving of seagrass to collect invertebrates, trampling of the grass, and use of destructive fishing techniques. Human population pressure has escalated human-animal conflicts due to crop damage and attacks by crocodiles, lions, elephants, and hippos that have killed and injured many people.</p> <p>The lower elevation areas surrounding Mount Namuli and Mount Ribaue are settled and intensively cultivated. Although there are no settlements in the highest reaches of the mountains, farmers have cleared one-third of the mountain forest in the past ten years thus reducing the mountain massifs' biodiversity and ecological integrity. Frequent fires have reduced the number and composition of tree species and altered the structure of secondary forests. In addition, the fires have reduced tree regeneration and opened up space for the proliferation of fire-resistant species such as <i>Pterocarpus angolensis</i>, <i>Pericopsis angolensis</i>, <i>Parinari curatellifolia</i>, and <i>Diplorhynchus condylocarpon</i> in open lowland forests.</p> <p>Commercial harvesting of fuelwood continues to degrade the woodlands and forests especially on the fringes of major urban areas. Records show massive declines in large mammal populations in protected areas (except in Niassa Reserve in the north) largely attributed to long periods of political instability, war, and insecurity. The use of shark nets, gill nets, and trawl nets threaten marine mammals, especially the endangered dugong, which is believed to be extinct, or on the verge of extinction in Maputo Bay.</p>
<b>Republic of Congo</b>	<p>The main threats to biodiversity are anthropogenic activities driven by increasing demands for food and energy, industrial development, illegal wildlife trade and hunting of trophies, disease outbreaks and epidemics as well as socio-political instability and civil unrest experienced by the country in the 1990s. Deforestation and uncontrolled harvesting of non-timber forest products, shifting cultivation, and bushfires destroy the forest ecosystems and biodiversity.</p> <p>Weak monitoring of vegetation worsens the situation as wildlife habitats are destroyed and fragmented thus creating ecological imbalance and loss of plant species. Shifting cultivation, slash and burn agriculture, use of agrochemicals (fertilizers and pesticides) and uncontrolled grazing degrade the ecosystems and cause biodiversity loss. Inland waters are threatened by destructive fishing methods that involve the use of illegal nets, chemicals and explosives, and the proliferation of invasive aquatic weeds. Marine waters are threatened by dredging, pollution from oil exploitation, overfishing in disregard of quotas, and destruction of spawning grounds by coastal erosion.</p>

**Climate change and variability** is a global environmental challenge that continues to cause negative impacts on several sectors in the project participating countries. The impacts are exacerbated by human population growth, increasing pressure on natural resources due to unsustainable resource use practices, poverty, and inadequate awareness about the consequences of resource degradation and depletion. Climate projections developed for the three participating countries using the models of the IPCC Fifth Assessment Report (IPCC AR5) indicate an increase in near-surface temperatures. The values in Table 2 are the projected temperature changes relative to the 1986-2005 mean temperatures (°C) in the project participating countries.

**Table 2: Climate projections for the three countries using the IPCC AR5 models**

Country	Under RCP		RCP 8.5	
	2046-2065 Temp. change	2081-2100 Temp. change	2046-2065 Temp. change	2081-2100 Temp. change
Botswana	1.5°C	1.5°C	3°C	5.5°C
Mozambique	1°C	1°C	2°C	3.5°C
The Republic of Congo	1.5°C	1.5°C	3°C	5°C

There is clear evidence of temperature changes in the project participating countries at RCP 8.5 making it imperative to consider the effect of climate change on protected areas and justifying the need for effective PA ecological monitoring in the countries during and after the project implementation.

Most people in the project countries are subsistence farmers practicing rain-fed agriculture with minimum agricultural inputs. Rain-fed agriculture accounts for 30 percent of the GDP in Africa and employs 70 percent of the population. As temperatures rise, precipitation will be erratic and uncertain blended with increased frequency and intensity of droughts, floods, heatwaves, and landslides. Many African countries, including the project countries, already experience this climate stress and have low adaptive capacity. Ecological monitoring in the PAs can be utilized as an inference of impact on the surrounding communities. There is a need to develop appropriate adaptation and mitigation strategies in tandem with robust policies to lower the negative economic impact on the agricultural sector that would help to relieve pressure on protected areas as the main source of livelihoods.

**Overexploitation of natural resources:** The project participating countries continue to experience overexploitation of natural resources (such as forests, wetlands, soil, biodiversity, aquatic and marine resources, and rangelands) which have led to biodiversity loss, soil erosion, and increased GHG emissions thereby aggravating the impact of climate change. Unsustainable and overexploitation of natural resources is a result of increasing human population and greater demands for resources, weak enforcement of environmental policies, and institutional capacity gaps among others. Inadequate policy implementation and institutional capacity gaps are the main causes of resource exploitation, degradation, and depletion in the project participating countries. For example, a recent UNDP report highlighted these weaknesses in Botswana's natural resource management sector and suggested the need to strengthen institutional capacity as one of the remedies.

**Land degradation** is prevalent in the project participating countries arising mainly from ecosystem fragmentation caused by human population pressures exerted on the natural resources. Land degradation, in turn, threatens local communities' livelihoods. In Botswana, for instance, climate change and human activities such as overgrazing in the Kalahari Desert, deforestation, and over-cultivation are responsible for land degradation. Local communities' dependence on firewood as a source of household energy has also degraded and depleted woodlands.

Land degradation in the drylands leads to desertification. Desertification, drought, or desiccation are not synonymous. Drought refers to short-term (1- to 2-year) deficits in rainfall which can generally be accommodated by existing ecological, technical, and social strategies. Desiccation refers to longer-term (decadal order) deficits in rainfall that seriously disrupt ecological and social patterns and require a

national and global response. Drought and desiccation do not automatically give rise to desertification. Much depends upon resource management practices: when human mismanagement of land weakens the natural system, drought and desiccation often lead to desertification.

Against this background, desertification refers to land degradation in drylands. One-third of the drylands in Africa are moderately or highly affected by desertification and 73 percent of the total agriculturally used drylands are degraded. While physical factors such as drought, desiccation, and climate change do play a part, mankind, however, is the primary agent of desertification. Mankind's role in causing desertification is revealed in the failure of resource management practices. Fight against desertification can only succeed if the welfare of mankind in the affected dryland areas are put at the centre of the development agenda and the adaptive strategies of their livelihood and production systems that confer drought resistance and/or lessen their susceptibility to drought and famine are bolstered.

Climatic variations and human activities are the main causes of desertification that affect biodiversity, including in protected areas. Overexploitation of fuelwood and unsustainable agricultural activities in the vulnerable ecosystems of the arid and semi-arid areas strains the productive capacity. These activities are sparked off by human population growth, the impact of the market economy, and poverty. Human population levels of the vulnerable drylands have a close relationship with development pressure on land by human activities which are one of the principal causes of desertification. There is a vicious circle by which a high number of people living in dryland areas exert pressure on vulnerable land through inappropriate natural resources management, poor agricultural practices, and daily subsistence activities, and worsening land degradation

### **Barriers to Addressing the Environmental Problems and Root Causes**

The long-term goal for addressing environmental and management problems in protected areas is to ensure that government agencies, civil society organizations, and private sector actors can conserve biodiversity and ecosystems by addressing current threats affecting their integrity and functioning, and by preventing the emergence of new threats. To progress towards this long-term goal, governments need to engage in a wide range of actions that require technical, administrative, financial, and networking capacity.

The key barriers to environmental conservation and sustainability which impede addressing the environmental problems and root causes discussed in section D are described below. These barriers will persist in the protected areas in the absence of this GEF intervention.

**Barrier#1: In-adequate capacity (technical, financial, and human resources) for effective management of protected areas:** State protected area management authorities in Africa, project participating countries inclusive, frequently face inadequate resource allocation that constrains their ability to achieve high levels of management effectiveness. Inadequate funding impedes investment in equipment, technology, staffing, and capacity-building activities which would improve management of protected areas. Notably, the majority of protected areas in Africa are found in remote landscapes and politically unstable regions and yet they harbour diverse plant and animal species that are threatened by human activities such as poaching, human-wildlife conflicts, insecurity, and encroachment. Shortage of skilled human resources and adequate equipment coupled with low funding renders monitoring of the vast remote PAs ineffective which exacerbates the environmental problems. The EarthRanger technology will be deployed to assist the resource-constrained protected area management authorities to monitor and conserve biodiversity and ecosystems.

**Barrier#2: Inadequate response mechanisms to wildlife crime:** Wildlife crime is the fifth-largest international criminal activity worldwide and has become increasingly well organized and ruthless. In many countries, protected areas are vulnerable to perpetual abuse due to weak judicial processes that fail to prosecute wildlife traders even if they are caught. Thus, there is a need for long-term changes in the management of protected areas with an emphasis on patrolling and enforcement along with efforts to address corruption, strengthen the judiciary, and improve enforcement along the illegal wildlife trade

chain. The EarthRanger technology will improve monitoring and patrolling of PAs and inform astute deployment of available law enforcement and wildlife management resources.

**Barrier#3: Insufficient knowledge, awareness, and access to information and technologies required to effectively monitor, manage and conserve protected areas coupled with weak coordination between responsible authorities:** This combination of barriers has led to low uptake of conservation technologies by PA management authorities and inadequate sharing of up-to-date information amongst PA management authorities (at regional, national and local levels) which would have significantly improved resource monitoring, management, and conservation. The EarthRanger technology has been deployed in over one hundred and fifty (150) sites in Africa, Asia, Europe, and America and this project offers an opportunity to strengthen coordination, learning, and sharing of information and best practices at regional, national and local levels.

**Barrier#4: Weak monitoring system to track performance:** Monitoring of protected areas management is inadequate in most countries in Africa and the same applies to the monitoring of project activities. Effective project monitoring is essential to ensure the success of the interventions.

**Barrier#5: Poverty, Human-Wildlife Conflict and PA encroachment:** This amalgamation of barriers leads to degradation of protected areas particularly if there is limited capacity to monitor and ensure community involvement in protected area management. Climate Change vulnerability exacerbates the situation. This combination of barriers are a root cause of degradation of terrestrial protected areas and lead to loss of biodiversity through habitat destruction and unsustainable exploitation of protected area resources. The increasing need for economic development coupled with population movements linked to conflicts and civil war drive communities towards encroachment to support their livelihoods and basic survival. There is thus a need to ensure greater monitoring and consequently engage in collaboration and support to communities.

**Case studies on how Earth Ranger is addressing selected global environmental problems in Africa**

Since 2014, Vulcan (and later AI2) has been working on a real-time situational awareness software program, now called EarthRanger, to enable and capacitate improved protected area management effectiveness through the deployment of technology. EarthRanger is a data visualization and analysis software for protected area management. The technology collects, integrates, and displays all historical and real-time data available from a protected area including wildlife, the rangers protecting them, spatial information, and threats among others. EarthRanger empowers protected area managers and rangers to take immediate and proactive actions to prevent and mitigate threat incidents.

EarthRanger has been successfully deployed across several public and privately managed protected areas. Based on the proven track record of success, the GEF and AI2 wish to deploy this software together with other enabling technologies across protected areas in Africa to help achieve higher levels of management effectiveness.

**Table 3** outlines case studies where the Earth Ranger Software was instrumental in addressing global environmental problems, root causes, and barriers in selected Africa countries by date of deployment.

**Table 3: Case studies ? how Earth Ranger is addressing selected global environmental problems in Africa**

Global environmental problems, root causes, and barriers	Earth Ranger (ER)	Impact
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Global environmental problems, root causes, and barriers		Earth Ranger (ER)	Impact
<p><b>Malawi</b></p> <p><i>Liwonde National Park, 2017</i></p>	<p><b>Human-Wildlife Conflict:</b>  Elephants eat for 16 or more hours a day and this makes calorie-rich crops attractive to roving pachyderms. This challenge is familiar to farmers near Liwonde National Park in Malawi where elephants raid crops, farmers lose revenue and create human-wildlife conflict. With the risk of nighttime crop damage, farmers stay up throughout the night to scare the elephants away and in some instances use violence to protect the crops.</p>	<p><b>Using Location Monitoring to Reduce Human-Wildlife Conflict</b></p> <p>Managed in partnership with African Parks, Liwonde's security team uses EarthRanger (ER) to monitor the time elephants pass geographic boundaries in order to intervene before they reach farmers' crops. With the geofences in place, Liwonde rangers are able to constantly monitor the park boundary for potential human-wildlife crossing. They are also more quickly able to respond to geo-fence breaks and intervene before tensions escalate with the adjacent local community.</p>	<p>Reduced crop raids farmers have resulted in better crop yields and higher incomes from crop sales, which enable farmers to meet family basic needs.</p> <p>More people around Liwonde have acquired knowledge and skills for gainful employment which helps to improve the local communities' livelihoods. Human deaths from wildlife attacks have decreased as mitigation measures are applied, conflicts have dropped and community trust has grown.</p>
<p><b>Tanzania</b></p> <p>Grumeti Game Reserve, 2017</p>	<p><b>Security:</b>  EarthRanger has helped the team better monitor park boundaries and ranger activity resulting in reduced poaching.</p>	<p><b>Park Boundary Monitoring Results in Decreased Poaching</b></p> <p>Grumeti managers used ER's heatmaps to analyze movement patterns of rangers to aid deployment and re-deployment. The ranger's connivance with poachers was detected, the ranger dismissed and prosecuted for the offence.</p>	<p>EarthRanger has enabled managers of Grumeti Game Reserve to maintain timely reporting and the management plan is based on the most complete and reliable real-time data.</p> <p>EarthRanger has improved monitoring of park boundaries and poaching has declined.</p>

Global environmental problems, root causes, and barriers		Earth Ranger (ER)	Impact
<p><b>Kenya</b></p> <p>Amboseli National Park</p> <p>Kenya Wildlife Service</p>	<p>? <b>Ecological Management</b></p> <p>? <b>Human-Wildlife conflict</b></p> <p>Human population growth and expanded development in the Amboseli ecosystem have reduced habitats for elephants and other wildlife. Development separates wild animal populations, disrupts traditional migratory behavior and, increases the risk of human-wildlife conflict as animals stray onto farmers' fields and damage crops and other property.</p> <p>Kenya Wildlife Service (KWS) deployed EarthRanger at its Headquarters at Nairobi National Park. KWS's human-wildlife conflict reporting system has improved across the country.</p>	<p><b>Big Life: Using Data to Ensure Safe Wildlife Corridor Migration</b></p> <p>Big Life - a wildlife conservation advocacy group based in Kenya's Amboseli ecosystem - has invested in the development of wildlife corridors to allow wildlife movement between protected areas.</p> <p>To maintain the corridors and monitor the frequency of wildlife movement, managers of Amboseli National Park utilize information from ranger reports, camera traps, and other technologies. Data from these technologies are consolidated in EarthRanger and activity visualized on an intuitive map.</p>	<p>The managers of Amboseli National Park have monitored movements in the wildlife corridors to ensure uninterrupted animal activities.</p> <p>In May 2019, Managers of Amboseli National Park tracked the successful passage of a 31-year-old male elephant (named Jenga), through the Amboseli-Tsavo wildlife corridor. With the wildlife corridor secured, the Managers of Amboseli National Park is capacitated to ensure human-wildlife conflict-free passage of animals between key reserves—a key component of a thriving wildlife population.</p>

Global environmental problems, root causes, and barriers		Earth Ranger (ER)	Impact
Sub-Saharan Africa Giraffe Conservation Foundation	<p>Giraffes are among Africa's most iconic wildlife, yet their conservation status is surprisingly less well known. In the 1980s, the total population of all giraffe species in Africa was estimated to be more than 155,000. Today, the Giraffe Conservation Foundation (GCF) estimates the population has declined nearly 30% to the current numbers of 111,000 giraffes in Africa. That is approximately one giraffe to every three to four elephants currently roaming African ecosystems. To save these incredible animals and conserve their habitats, it is vital to gain a better understanding of their space use needs and required resources.</p>	<p>Over the past five years, the Twiga Tracker initiative<sup>[1]</sup>, led by GCF and supported by the Smithsonian Conservation Biology Institute (SCBI) has deployed over two hundred GPS units to track giraffe throughout Africa. With the help of manufacturers and veterinarians, the initiative developed a solar charged tracking device that's roughly the size of a deck of cards. The device records the GPS location of individual giraffe each hour and transmits these spatial data directly to researchers through a network of satellites and displayed by EarthRanger.</p> <p>The advances in GPS tracking technology are opening incredible and exciting avenues for understanding animal movements with a scale and accuracy unlike anything we've seen before, said Michael B. Brown, conservation science fellow at the GCF and SCBI. The vast quantities of data generated by these tracking devices require new data management tools to efficiently process, analyze, and visualize the data. That's where rapid data management and visualization platforms are filling crucial needs for animal conservation.</p>	<p>Twiga Tracker has deployed over 225 tracking units on all four species of giraffe, spanning ecosystems across sub-Saharan Africa and collecting over 1.5 million data points to date. The initiative has published over ten peer-reviewed scientific publications so far, sharing the first evidence of spatial migration in certain giraffe populations in Uganda, new descriptions of nocturnal behavior of desert-dwelling in Namibia, and expanding the knowledge of the space use needs of giraffe in sub-Saharan Africa.</p> <p>The EarthRanger platform also shares giraffe locations and space use with conservation partners in real-time. Rapid access to giraffe locations and automated geofencing alerts have allowed for ranger teams in the field to better target conservation patrols and to rapidly mobilize when giraffes leave the relative safety of protected area boundaries.</p>

The proposed project will address the capacity gaps of the participating countries, by supporting government-identified needs for protected area management and building sustainable country-based peer learning experiences and capacity building. The project participating countries have confirmed the desire for technical and infrastructural capacity building to support their protected areas monitoring and management.

## 2) The baseline scenario and any associated baseline projects

### **Current Baseline (Business-As-Usual Scenario)/Future Scenarios without the Project**

The project participating countries have progressively been adopting the use of cost-effective protected area monitoring tools for effective response to management and mitigation of ecological challenges. These are adopted as they become available, however data collection methods are still inadequate, and most protected areas are not clearly linked to a central management unit to enable a coordinated response.

In the absence of information and real-time data, protected area (PA) managers are compelled to deploy the limited resources and assets at their disposal randomly with the hope of achieving satisfactory area coverage, monitoring, and enforcement. This is an inefficient and ineffective approach with limited impact. PAs that have adopted new and emerging technologies to improve real-time data gathering to enable situational awareness will attest to the impact of EarthRanger technology on PA management effectiveness. To date, new and emerging technologies have mostly been adopted by privately managed PAs where managers took the risk of adopting untested innovations. However, numerous examples of successful deployment of such technologies across Africa have helped to refine and improve the technologies and enhanced the users' confidence in them.

The EarthRanger technology has visualization capability that allows managers to gain a real-time, in-depth understanding of illegal activities such as poaching and other habitat threats. This technology enables PA managers to monitor vast areas remotely, keep track of wildlife and rangers' movements in the field, and ensure that patrols are carried out properly, rangers' safety is assured and response teams can be dispatched immediately when the need arises. Without this technology in place:

? PA teams will maintain paper-based reports and store them as records. Such reports can easily get lost or get destroyed by natural conditions in the field, leading to gaps in data and an incomplete account of activities in the protected area.

? Safety of the PA management teams and wildlife is at risk and response to a situation (e.g. infiltration by poachers) will be slow and ineffective.

? Management of vast protected areas will be impossible given the few personnel. As a result, management challenges such as poaching, encroachment, human-wildlife conflicts, and other forms of wildlife crime will escalate as most of the problems will not be addressed in time.

The EarthRanger Technology also enables real-time and historical data analyses and gives insights into critical trends such as animal behavior, habitat alterations, ecological changes, and others. This enables PA managers to monitor the wildlife, habitats, and other landscapes through sensors, reliable reporting, and up-to-date field data to effectively manage the PAs. Without this technology in place:

? Human-wildlife conflicts will increase because changes in animal behavior (e.g. change in migration routes, grazing areas, breeding territory, water points, encroachment by communities) will not be detected and addressed in good time to avoid conflicts.

? Protected area managers will not be able to make informed decisions to address current and future threats to the conservation areas.

The Earth Ranger Technology is capable of quantifying key information and showing tangible results to the protected area managers. Without the technology, protected area managers will not be able to report positive results to donors thus leading to a reduction in funding. This will exacerbate the already

dire situation in Africa where protected area management effectiveness is curtailed by inadequate funding.

The baseline scenario, typical of most PAs in Africa, is the impaired management effectiveness due to weak human and institutional capacity, and limited funding. Despite these challenges, PA managers are expected to deploy the limited resources and assets at their disposal and to utilize scant information for planning, decision making, and response to challenges and threats to wildlife and habitats. This limitation compounds the inefficient and ineffective use of the resources. Knowledge of when and where to deploy resources in a resource-constrained environment is a crucial and timely deterrent of illegal activities in PAs and helps to optimize management efforts in the field.

### **Implications for Business as Usual (BAU) Scenario**

The BAU scenario has great implications for the countries' ability to ensure effective PA management and will consequently affect sustainable biodiversity conservation. Without the EarthRanger project, monitoring of biodiversity resources and management effectiveness in the selected PAs within the three countries would remain inadequate and lead to unsustainable exploitation of natural capital due to inadequate capacity to respond to threats. In the end, the biological resources in the PAs will be degraded and depleted.

*a) Institutional coordination:* Absence of a functional central response unit is a major setback to the three countries' timely response to PA management threats.

*b) Compliance with effective protected area management standards:* The three project participating countries are signatory to the Convention on Biological Diversity and will lag in compliance if they do not adhere to the NBSAPs targets.

*c) Policy accountability:* The three project participating countries do not have a robust system for effectively assessing the ecological status and management effectiveness of the PAs. As such the three countries and others with similar bottlenecks will not be able to track the status of biological resources in terms of quality, quantity, and timing for the set targets. Under this scenario, it will remain difficult to discern the achievement of the expected and actual policy goals, and how they compare and contribute to the aggregate global outcomes.

*d) Comparability of ecological reporting:* The three countries' current capacity to report on the status of biological resources both nationally and internationally is not based on real-time data generated, processed, and relayed in a timely manner by appropriate technology.

### **Associated Baseline Projects**

On-going initiatives that seek to improve management of Protected Areas are summarized below:

#### **Global and Regional Initiatives**

**AI2 Programs on Countering Poaching and Human-Wildlife Conflict (<https://vulcan.com/Our-Work/Conservation.aspx>):** The use of the EarthRanger technology in promoting management effectiveness of protected areas is progressively taking root on the African continent, for instance, it is already being implemented in countries such as Kenya, Rwanda, Tanzania, and Malawi among others. EarthRanger deployment is an on-going initiative to support PA management. Efforts will be directed towards fostering partnerships among expertise and facilitating exchange visits to further increase the uptake of the technology.

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

**Project Location:** Afghanistan, Botswana, The Republic of Congo, Cameroon, Ethiopia, Gabon, Indonesia, India, Kenya, Mali, Malawi, Mozambique, Philippines, Thailand, Tanzania, Viet Nam, South Africa, Zambia and Zimbabwe.

**Duration:** 2015 ? 2022

**Description:** This is a USD 131 million project funded by the Global Environment Facility (GEF) and the World Bank. The project participating countries in Africa are Botswana, Congo, and Mozambique. The GEF-6 Global Wildlife Program (GWP) is implemented at the global, regional, and national levels. The project established a learning and coordination platform to mitigate Illegal Wildlife Trade (IWT) and increases technical capabilities to curb it. The project is aimed at strengthening national strategies to improve wildlife and protected area management, enhance local community livelihoods, strengthen law enforcement, and reduce illegal activities through behavior change. Funds are channeled to governments through development partners such as World Bank, 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 (ICWC), other donors and conservation partners to implement integrated biodiversity conservation approach, wildlife crime prevention and sustainable development. The conservation partners include Global Environment Facility (GEF), International Union for Conservation of Nature (IUCN), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Secretariat, TRAFFIC, WildAid, Wildlife Conservation Society (WCS) and World Wildlife Fund (WWF).

In Mozambique, the USD15.8 million fund is supporting Gorongosa National Park (Gorongosa-Marromeu Complex) and the Niassa National Reserve focusing on promoting the value of wildlife and combatting illegal wildlife trafficking, strengthening enforcement capacity in key protected areas, establishing conservancies to expand the Gorongosa Protected Area complex, restoring degraded habitats and supporting rural livelihoods.

**Title of Project:** Biodiversity and Protected Areas Management Programme (BIOPAMA)

**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 is a sixty million Euro (?60 million) investment program aimed at improving long-term conservation and sustainable use of biodiversity and natural resources in protected areas and the surrounding communities in African, Caribbean and Pacific (ACP) countries. It is an initiative of the ACP Group of States financed under the European Union's 11th European Development Fund (EDF) and 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 play pivotal roles in BIOPAMA by supporting data collection, analysis, monitoring and reporting, building capacity of staff and organizations to manage 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, The Republic of Congo, Djibouti, Eritrea, Ethiopia, Gabon, Kenya, Comoros, Rwanda, Sudan, South Sudan, Chad, Tanzania, Uganda, Democratic Republic of Congo (DRC).

**Description:** The project is funded by GEF via UNDP to the tune of USD 1,963,500. The project is an initiative to provide financial and technical support to GEF-eligible Parties to the Convention on Biological Diversity (CBD) to develop (i) high quality, data-driven sixth national reports (6NR) that will improve national decision-making processes for implementation of NBSAPs, (ii) a report on progress towards achieving the Aichi Biodiversity Targets (ABTs) so as to 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 Dry land Sustainable Landscapes.  
**Project location:** Angola, Burkina Faso, Botswana, Kenya, Kazakhstan, Mongolia, Malawi, Mozambique, Namibia, Tanzania, Zimbabwe

**Description:** The project is funded by GEF via FAO to the tune of USD 95,844,674. The objectives are a) Integrated landscape management focusing on sustainable forest management and restoration, rangelands, and livestock production; b) Promotion of diversified agro-ecological food production systems in dry lands taking into consideration their biodiversity; c) Creation of an enabling environment to support objectives (a) and (b).

**Title of Project:** Integrated Trans boundary River Basin Management for the Sustainable Development of the Limpopo River Basin.

**Project location:** Botswana, Mozambique, South Africa, Zimbabwe

**Description:** The project concept was approved. It is to be funded by GEF via the World Bank to the tune of USD 6,000,000. It is aimed at promoting sustainable development in the Limpopo River basin through Integrated Water Resources Management (IWRM) at the trans boundary, national, and local scales to balance environmental, social and economic benefits.

The Limpopo River Basin hosts protected areas and a number of biodiversity hotspots. The Great Limpopo Transfrontier Park, comprising the Kruger National Park in South Africa, the Limpopo National Park in Mozambique, and the Gonarezhou National Park in Zimbabwe are located in the basin and cover an area of approximately 3,577,144 ha. The transfrontier conservation area encompasses a wider area around this transfrontier park, including rural and urban areas in which communities live (GEF, 2019). The total funding mobilized for Mozambique is USD 480,000.

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

**Project location:** Central African Republic, Republic of Congo, Cameroon, Gabon, Equatorial Guinea, Democratic Republic of Congo (DRC)

**Duration:** 2019-2022

**Description:** The project concept was approved. It is expected to be funded by GEF via UNEP to the tune of USD 57,201,127. The objective of the project that is implemented in the Republic of Congo is to promote a model for integrated community-based conservation and protected area management in the country's peat land area and forest ecosystems.

### National Initiatives

National level initiatives in the project participating countries that will benefit the EarthRanger project are presented in **Table 4**. The linkages between these projects and the EarthRanger project are outlined in **Table 13**.

**Table 4: Baseline initiatives at national level in the project participating countries**

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
<b>Botswana</b>			

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Managing the human-wildlife interface to sustain the flow of agro-ecosystem services and prevent illegal wildlife trafficking in the Kgalagadi and Ghanzi drylands (Global Wildlife Program).	<p>The objective is to promote an integrated landscape approach to managing Kgalagadi and Ghanzi dry lands for ecosystem resilience, improved livelihoods and reduced conflicts between wildlife conservation and livestock production</p> <p>The thematic focus is recognition and management of conservation areas for protecting wildlife migratory corridors; community rangeland management and pastoral production practices; strengthening of institutional and community capacity for implementing landscape planning and integrated sustainable management; development and implementation of national strategy for combating wildlife crime (capacity building, inter-agency collaboration and local level participation)</p>	<p>Project sites are Kalahari savanna/central Kalahari Game Reserve (CKGR) and Kalahari Transfrontier Park (KTP); Kgalagadi/Ghanzi drylands in western and southwestern Botswana; Orange-Senqu transboundary river basin; Ngamiland</p> <p>The species in focus are lions, cheetahs and wild dogs.</p>	<p>GEF/WB</p> <p>USD 6 million</p>

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
National Biodiversity Planning to Support the implementation of the CBD 2011-2020 Strategic Plan in Botswana	To integrate Botswana's obligations under the CBD into its national development and sectoral planning frameworks through a renewed and participatory biodiversity planning and strategic process	Botswana (Global) Start date: January 2018 Estimated end date: December 2022	USD 18,022,275  United Nations Development Programme, Government of Norway, Flanders International Cooperation Agency, Flemish Government and Federal Office for The Environment (FOEn)
Support to the Ministry of Finance and Economic Development to lead in the coordination of SDGs implementation in Botswana	To support the Government of Botswana in the implementation of the SDGs, the SDGs roadmap and other emerging strategic issues such as South-South and Triangular Cooperation (SS&TrC) and human resource development.	Botswana - National Start date: January 2018 Estimated end date: December 2021	USD 550,544 United Nations Development Programme, Government of Botswana
Support to the Botswana Environment program	The objectives of the project were (i) to strengthen the systems for conservation and sustainable use of natural resources; and (ii) to establish a national environmental information management system	Botswana (National) (Completed)	USD 4,630,833 UNDP and Government of Botswana

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Botswana Pandamatenga Agriculture Infrastructure Development Project	The sectoral goal of the project is to contribute to the attainment of increased crop diversification, agricultural output and productivity as stated in the National Master Plan for Agriculture and Dairy Development.	Botswana (Pandamatenga) Status: Ongoing	UA 42.94 million African Development Bank (UA 37.27 million loan) and Government of Botswana (UA 5.56 million)
Emergency Water Security and Efficiency	The aim is to improve availability of water supply in the drought prone areas, increase the efficiency of Water Utilities Corporation (WUC) and strengthen wastewater management in selected systems.	Botswana (National) Status: On-going	USD 160 million World Bank and Government of Botswana
Mozambique			
Strengthening the conservation of globally threatened species in Mozambique through improving biodiversity enforcement and expanding community conservancies around protected areas.	The expected outcomes include: (a) Conservation of globally threatened species in Mozambique strengthened through implementation of the Conservation Areas Act; (b) Improved biodiversity conservation enforcement; (c) Expanded protected areas through establishment of community conservancies while supporting rural development activities.	The project sites are Gorongosa National Park (Gorongosa-Marromeu Complex) and the Niassa National Reserve with focus on elephants, rhinos, and leopards. The executing partners are: National Agency for Conservation Areas (ANAC), Gorongosa Restoration Project & Wildlife Conservation Society in Niassa.  Duration: 2017 -2024	GEF (via UNDP) Project amount: USD 15,750,000

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Mozambique Conservation Areas for Biodiversity and Development (MOZBIO)	The objective is to increase effective management of conservation areas and enhance living conditions of the adjacent local communities. The project's activities are linked to Component 1 of the GEF 6 strategy. By improving protected area management, the project aims to reduce poaching, wildlife and forest related crimes, and illegal wildlife trade. The EarthRanger project will leverage interventions on human resource management and improvement in MOZBIO, establish synergies and collaboration, and will benefit from lessons learnt.	MOZBIO supports ANAC to improve management of protected areas other than Niassa and Gorongosa.  The project period was 2014-2019 but it is still on-going.	GEF (via World Bank) Project amount: USD 46.32 million  (WB- USD 40 million and GEF USD 6.32 million)
Kheta Project, implemented by the governments of Mozambique and South Africa by the Department of Environmental Affairs (DEA), South African National Parks (SANParks), the National Administration of Conservation Areas (ANAC) and the Attorney General's Office in Mozambique (PGR).	The project addresses the continued decline of Africa's elephant and rhino populations due to wildlife trafficking.	Limpopo Transfrontier Park	Partners include WWF-South Africa, WWF-Mozambique, TRAFFIC, the Endangered Wildlife Trust (EWT) and the International Union for Conservation of Nature (IUCN),  USD 16.5 million

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
BIOFUND	BIOFUND raises two separate types of funds: Funds for investment (Endowment), and funds for direct application (Sinking funds)	This is a national initiative implemented in the whole country.	It is forecast that, by 2020, BIOFUND will have granted about USD 5 million to the ACs from the two sources.
Niassa Carnivore Project (2012 ? 2027)	<p>The project has three goals:</p> <p><b>Goal 1:</b> to secure ecologically stable leopard, spotted hyena, wild dog and lion populations in Niassa Reserve, with at least 1000 ? 2000 lions not attacking livestock and people.</p> <p><b>Goal 2:</b> to develop a model for sustainable partnerships between local communities and conservation organisations resulting in effective conservation management with increasing wildlife populations, decreased illegal activities and increasing income and benefits to local communities to support conservation friendly development,</p> <p><b>Goal 3:</b> to develop a locally relevant, sustainable environmental education, and skills training in Niassa based at Mariri environmental and skills training centre to promote conservation and coexistence with large carnivores and provide alternative livelihoods</p>	Across Niassa Reserve the lion population appears to be stable (between 800-1000 lions) but there are concerns about the declining populations of leopard, hyena, wild dog. There are also concerns about poisoning of lions? bone trade. The first poacher was caught with lion bones in 2016 by L7, Niassa Wilderness. In the past 3 years, 64 leopards, 23 lions, 37 hyenas and 24 wild dogs have been killed illegally across Niassa Reserve.	Rufford Small Grants: USD 1551 032
<b>The Republic of Congo</b>			

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
North Congo Forest Landscape Project (PPFNC)	The aim of the project is to ensure the maintenance of ecological continuums and preservation of biological diversity in the territories of the North of Congo by supporting a socio-economic development and a rational planning of the territory.	North Congo in Likouala, Sangha and Cuvette West with an area of 9.5 million ha.  <b>Status:</b> Territorial integration project	Global funding of 8.954 million: 7.26 million (AFD) 1, 684 million (FEM)
Congo Conservation Company	Development of village lands and improvement of the conditions of local communities and indigenous peoples (CLPA) through community-based ecotourism enterprises	North Congo in the departments of Cuvette Ouest, Likouala in the peripheries of Odzala-Kokoua and Nouabal?-Ndoki national parks.  <b>Status:</b> Conservation company	Global funding of Euro 4.360 million (European Union and South Africa)
Inventory and field tests for deployment of IT Legality Verification System (SIVL) with stakeholders	The aim is to monitor and mitigate deforestation in forest management units (FMUs) granted to logging concessionaires	National territorial (d?partent): Pointe-Noire, Kouilou, Niari, Bouenza, L?koumou, Plateaux, Cuvette, Cuvette Ouest, Sangha and Likouala. <b>Status:</b> Program on traceability and control logging - Currently planned to end in June 2021, but with the possibility of seeking further funding.	FAO-EU FLEGT: Euro 677,000

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
National Afforestation and Reforestation Program ( ProNAR )	<p>The objective is to establish forest and agroforestry plantations so as</p> <p>to increase carbon stocks at the national level and ensure the country's supply of timber (timber, fuel wood, service timber) and non-timber products (essential oils, resins, honey, fruits, vegetables and others).</p>	<p>National coverage over 1 million ha</p> <p><b>Status:</b> State program planned to be completed at the end of November 2021</p>	<p>Global financing: USD 3 million comprising USD 2 million by the Government of Congo USD 1 million by private partners</p>
Ecosystem management project from the periphery of Park (PROGEPP)	<p>The aim is integration of wildlife conservation and management in forest concessions, through a collaboration between WCS, the Congolese government, forest concessions and the local population</p>	<p>North Congo in the Sangha Department at the level of the forest concessions of Kabo (CIB-OLAM) and NGomb? (IFO).</p> <p><b>Status:</b> Community development project</p>	<p>Financing CARP amounting to USD 0.9 million by companies IPC-OLAM and Forest Industry Ouessou (IFO)</p>

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Creation of Conkouati Dimonika Protected Area Complex and Development of Community Private Sector Participation Model to Enhance PA Management Effectiveness <sup>[4]</sup> <sup>3</sup>	The objective was to ensure biodiversity conservation and management effectiveness through creation of protected area complex and implementation of communities and private sector participation model. A new protected area called Ntombo and a corridor for maintaining natural ecological connectivity were created with the participation of local communities and the private sector operating within the boundaries of the complex.	South Congo in the department of Kouilou on an area of 423,000 ha (145,000 ha PA to be created and 278,000 ha for corridors)  <b>Status:</b> Integrated community forest reserve / Biosphere reserve. The Project was submitted in 2013 and approved in June 2016 for implementation and has been operational since 2018. The duration is 48 months.	Global funding totaling 18.2 million: 2.9 million (FEM) 15.3 million co-financing
Creation of Loango Bay Marine Protected Area to support Turtles Conservation in the Republic of Congo	The project is aimed at conservation and sustainable management of marine biodiversity through concerted and participatory protection of marine turtle habitats	South Congo in the Kouilou Department. The PA being created will cover an area of 65,000 ha; made up of a marine area (60,000 ha) and a land area 5,000 ha)  <b>Status:</b> Integrated community reserve Project duration: 48 months (2018 -2022)	Global Financing Total funding is USD 3.35 million: GEF USD 0.7 million Co-financing USD 2.635 million

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Integrated and Trans frontier Conservation of Biodiversity in the North Congo Basins <sup>[5]</sup> <sup>4</sup>	The objective is to strengthen the efficiency of PAs through the operation of peripheral buffer zones and biological corridors for the interconnection of protection nuclei	North Congo in the Departments of Cuvette, Cuvette Ouest and Sangha. The project covers a total area of 1,533,600 ha including the Odzala-Kokoua National Park (1,354,600 ha), the Lossi Gorilla Sanctuary (35,000 ha) and the creation of Messok -Dja PA on 144,000 ha.  <b>Status:</b> Tridom Landscape of the Congo Basin	Total Global funding: 25.052 million: - 3,570 million (FEM) - 1 million (UNDP) - 20,482 million of Co- financing
Community-based integrated conservation of peat land ecosystems and promotion of ecotourism in the landscapes of Lake Tele in the Republic of Congo	The aim is to develop an integrated model for the use and sustainable management of peat land ecosystems through participatory conservation	North Congo in the departments of Likouala and Cuvette  <b>Status:</b> Lake Tele Landscape of the Congo Basin Project is awaiting evaluation by the GEF Secretariat	Funding: FEM: USD 6 million Co-financing USD 41 million

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
<p>Strengthening the Management of Wildlife and Improving Livelihoods in Northern Republic of Congo</p> <p>(The project seeks to Increase the capacity of the forest administration, local communities and indigenous peoples to co-manage forests). It is a national GEF project whose three components are in a primary project of the World Bank called " Forest and Economic Diversification Project (PFDE) "</p>	<p>The objectives are (1) to provide support for the national anti-poaching strategy and the resulting activities;</p> <p>(2)</p> <p>improve the management effectiveness of Ntokou Pikounda National Park to enhance habitat and biodiversity conservation, (3) to support eco-tourism activities in the southern ring road of Nouabal? Ndoki National Park);</p> <p>(4)</p> <p>mitigate land degradation and promote sustainable forest management</p>	<p>Ntokou Pikounda National Park, Nouabal?-Ndoki National Park (2017?2021)</p>	<p>GEF ? USD 6,5 million</p> <p>Co-financing (fonds IDA/BM): USD 74 millions</p>

National initiatives in Project countries			
Project/Initiative	Objectives and thematic focus for addressing environmental issues	Geographical scope and status	Source of funds and budget amount (USD)
Support for conservation and sustainable management of biodiversity in the TRIDOM Interzone Congo area (ETIC)	<p>The objectives are to:</p> <p>(i) Promote conservation and sustainable management of natural resources for poverty reduction:</p> <p>(ii) Support anti-poaching surveillance and control.</p> <p>(iii) Promote cross-border collaboration</p> <p>(iv) Monitor animal populations (inventory) for the creation of the Messock-Dja Forest Reserve</p> <p>(v) Support</p> <p>- comminatory development</p>	<p>North of Congo in the districts of Semb?, Souank? and Ngbala (Department of Sangha) and covering an area of 2,100,000 ha</p> <p><b>Status:</b> Conservation project (Ministry Forest Economy and WWF (2019-2022))</p>	<p>Source of funding : WWF, EU, segr?, arcus, cawfi</p>

3) The proposed alternative scenario, with a brief description of expected outcomes and components of the project

## **Cost-Effectiveness Analysis of the chosen alternative**

### Alternatives to the Business-as-Usual Scenario

Multiple alternative scenarios can be considered as 'business-as-usual' (BAU) and premised on functional PA management institutions with structures that can undertake robust monitoring of PAs and provide timely responses to threats in the three project participating countries. The alternatives to the BAU scenario involves: (i) strengthening the institutional and technical capacity of PA managers in the participating project countries (ii) strengthening the capacity of protected area managers to deploy the limited assets and resources at their disposal in an informed, effective and efficient manner, thereby improving the impact and overall management effectiveness and, (iii) increasing EarthRanger technology uptake by other African countries and enhancing awareness about the benefits of applying it in wildlife conservation and PA management.

The Convention on Biological Diversity (CBD) obligates countries to ensure sustainable management of biological resources through among others, promoting cost-effective management of biodiversity-rich protected areas. Countries have been supported to develop National Biodiversity Strategy and Action Plans (NBSAPs) which outline activities to be undertaken at the national level and through global collaborations to ensure sustainable management of biodiversity. Given that biological resources may not necessarily be protected singly, there is a need to strengthen the capacity to effectively manage protected areas. This EarthRanger project proposes a regional approach to promote effective coordination of cross-learning and sharing best practices among the project participating countries.

### **Scenario: EarthRanger intervention implemented at specific PAs and coordinated under a regional framework (Project scenario)**

**Positive elements of this Scenario:** This scenario represents the proposed EarthRanger project and focuses on protected area and national levels capacity building followed by a regional level experience sharing. The scenario provides for and highlights the need to strengthen protected area level capacity, country-level supervisory capacity as well as scale up the use of EarthRanger technology by other African countries. The national-level learning feeds into the regional experience sharing. When the PA level capacity is strengthened and functional, the national and regional cross-learning activities will easily be actualized and operationalized. This scenario offers a great opportunity for improved coordination, strengthening of regional collaboration, and cross-learning. The structure of this approach is hinged on the fact that protected areas are given priority for strengthening management capacity as it lays a solid foundation for demonstrating the feasibility of deploying EarthRanger technology for generating reliable and accurate data to aid decision making at the protected area level as well as at national and regional levels. Therefore, this regional, national, and field level approach yields the best results as opposed to Scenario 1 and 2 because capacity is built at all levels, and the immense potential for cross-learning and experience sharing can be sustained when the project ceases.

### **Cost-Effectiveness Analysis of Chosen Alternative**

The chosen alternative is structured under 3 components. It is anchored on the existing national state and non-state-protected area management structures and information generated by this project will be shared through the existing national and regional linkages. This regional project's interventions will strengthen existing PA management structures at the national level, build on previous and ongoing national and regional conservation initiatives run by the selected in-country executing partners who are currently managing the PAs together with the respective governments and ensure learning and lesson sharing across the three project countries and the regional Earth Ranger community that is spread across African PAs.

This project will work with key stakeholders at the country and regional level who already have ongoing activities in the target PAs and technical experience undertaking similar work. Through this approach, this project will ensure ownership of results by stakeholders and sustainability of the project outcomes. This scenario of strengthening protected area level capacity ensures the sustainability of management approaches at the ecosystem level as well as country-level supervision.

Scaling up the use of EarthRanger technology by other African countries will increase the protection of biodiversity. Furthermore, the scenario provides an opportunity for improved protected area management through effective monitoring of threats, improved coordination, ecological monitoring, cross-learning, and efficient utilization of human resources.

The non-state executing partners (AI2, Peace Parks Foundation, African Parks, No?, and the Wildlife Conservation Society (WCS) have committed co-financing totaling US\$ 4.4 million which accounts for 67% of the total project's financing. This co-financing complements activities funded by the GEF which account for 33% of the total project's financing.

### **The Project's Theory of Change**

The Protected areas in Africa in general, and Botswana, Mozambique, and The Republic of Congo, in particular, are increasingly experiencing degradation and loss of biodiversity through habitat destruction and unsustainable exploitation of resources for domestic and commercial purposes. Various causal factors may be tendered, including among others, the increasing needs for economic development, population movements linked to conflicts and civil war as well as inadequate application of modern management systems and technologies. However, the main underlying problem being addressed by the EarthRanger project is the limited capacity among the project participating countries to effectively monitor and manage the vast tracts of terrestrial protected areas to address threats to wildlife and biodiversity. The Project, therefore, aims at strengthening the management effectiveness of priority protected areas through the deployment of the EarthRanger technology and associated infrastructure. It is anticipated that the Project will address the barriers to protected area management effectiveness, to improve the management of selected protected areas in Africa. The Theory of Change (ToC) for this project is a tool that explains how and why the EarthRanger Project intervention is expected to achieve the intended changes, (i.e., the goal, short-term and long-term outcomes), based on a set of key causal pathways arising from the project's activities and outputs, and the assumptions underlying these causal connections (STAP, 2020), (Harries et al, 2014), and (Charities Evaluation Services, 2013). The ToC identifies the key problem being addressed, elaborates the root causes and barriers, and provides logical pathways consisting of the interconnectedness between the project interventions to address the barriers, the outcome pathways, and anticipated impacts.

The main root causes and barriers to effective management of the protected areas and biodiversity conservation include, among others (i) Inadequate capacity (technical, financial, and human resources) for effective management of protected areas; (ii) Inadequate response mechanisms to wildlife crime; (iii) Poverty, Human-Wildlife Conflict and PA encroachment; (iv) Insufficient knowledge, awareness and access to information and technologies required to effectively monitor, manage and conserve protected areas; and (v) Weak monitoring and evaluation system to track performance and profile areas for improvement. By addressing these root causes and barriers, the deployment of the EarthRanger and related technologies aims at improving the management effectiveness of the protected areas. The logical pathway encompasses increased awareness and hands-on technical experience of the protected area managers, who had hitherto not applied the technology in their day-to-day protected area management practices to apply the EarthRanger technology.

The anticipated positive changes (or Project Outcomes) include:

- (i) Strengthened institutional and technical capacity of participating countries to effectively manage the protected areas. This positive change will lead to the improved ecological integrity of the

target protected areas. Improved ranger patrol efficiency will contribute to better security for rangers, stable biodiversity in the protected areas, and positive relationships between the adjacent local communities and protected area managers.

- (ii) Additional countries in Africa are interested and committed to adopting Earth Ranger technology; and
- (iii) An integrated ecological monitoring framework at the protected area level.

The impact pathway includes the attainment of the long-term goal of global benefits namely; terrestrial protected areas are sustainably managed for conservation of biological diversity, continuous flow of ecosystem services, and climate change mitigation. The indicators of this desired change are reduced threats to biodiversity in protected areas, secured wildlife habitats, the population of threatened species increased and tourism and community-related benefits enhanced. The main pre-conditions (or mid-term outcomes) are (i) protected areas management system strengthened with the deployment of the EarthRanger and related technologies (MTO 1); (ii) 4,901,650 ha of terrestrial protected areas sustainably managed (MTO 2); (iii) protected area personnel skilled and knowledgeable in the application of the EarthRanger and related technologies (MTO 3); and (iv) Additional African countries committed to adopting EarthRanger or other PA management technologies (MTO 4).

The ToC also identifies the key enablers and assumptions, which are important factors that will contribute to the success of the Project intervention and attainment of the anticipated outcomes - improved management of the protected areas. These enablers and assumptions are indicated in Figure 2 as E and A, respectively. The main enablers include:

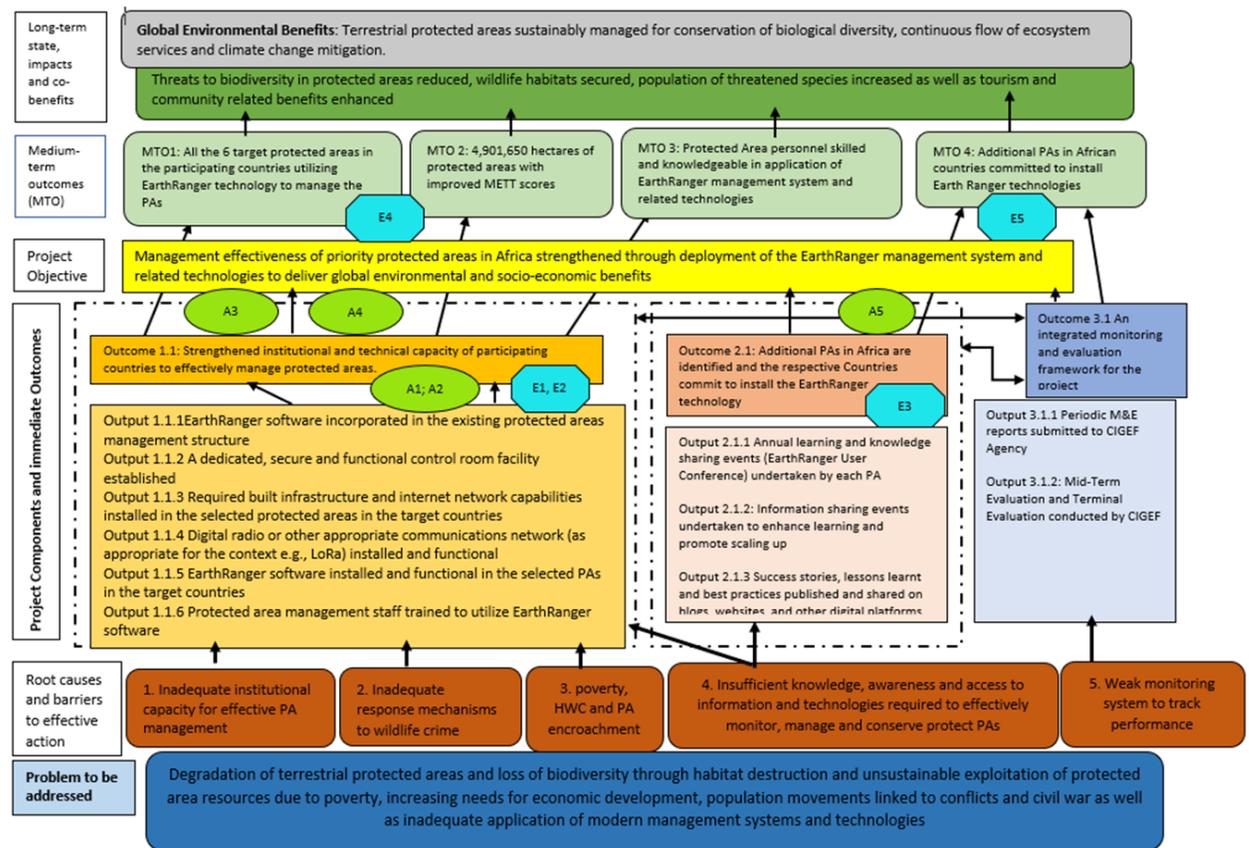
- ? Favorable governance that permits implementation of relevant policies and regulations, including the existence of functional institutional structures for the management of protected areas (e.g., supportive Ministries and Departments responsible for wildlife conservation in the project countries, availability of adequate staff, and the existence of reliable infrastructure including power supply, road networks and ranger posts in the protected areas ? E1.
- ? Willingness to embrace new technology like EarthRanger to strengthen protected area management and biodiversity conservation - E2.
- ? Commitment to regional and international obligations as well as the willingness of project participating countries to share information ? E3.
- ? Available capacity to translate and share information in official languages in the project participating countries (English, French, and Portuguese). Hence language differences will not be a barrier in facilitating knowledge and information sharing ? E4; and
- ? Participatory management of protected areas ? E5.

In the logical pathway, the underlying assumptions include:

- Political will and stability in the project participating countries ? A1.
- EarthRanger technology will be accepted by the governments of the project countries and protected area managers will apply it to sustainably manage and conserve biodiversity ? A2
- Supportive stakeholders, including local communities, that foster collaboration, and partnerships ? A3
- Adequate security in and around the protected areas ? A4; and
- Astounding achievement with the application of EarthRanger technology will motivate other countries to adopt it and replicate its use in biodiversity conservation ? A5.

**Figure 1** represents the ToC for this project, based on the universal development approach and practice and also elaborated by Pirroska Bullen (2020). The inter-connectedness between the project interventions tailored to address the barriers, the outcome pathways, and anticipated impacts is shown in the diagram by arrows.

**Figure 1: Theory of Change for the CI-GEF EarthRanger project**



## Objective, Components, Expected Outcomes, Targets, and Outputs

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

**Project Duration:** 45 months

The project components are described in detail below including the expected outcomes, outputs, and activities.

### **Component 1: Installation of EarthRanger software together with other required technologies and infrastructure to achieve EarthRanger readiness**

Deployment of the EarthRanger protected area management system and associated technologies will improve real-time situational awareness and enable protected area managers to utilize the limited assets and resources at their disposal in a more informed, effective, and efficient manner, thereby improving the impact and overall protected area management effectiveness. This component will support capacity-building with a focus on the installation of the software and associated hardware infrastructure and training of protected area management staff on the use of the software. In consultation with the governments of the project participating countries, regional institutions, and experts, the needs assessment for the selection of protected areas to establish the site-specific infrastructure requirements was carried out remotely due to COVID-19 travel restrictions. More detailed assessments will be undertaken during the project's inception period.

Component 1 has one outcome that delivers six (6) outputs presented in the Project Results Framework (Appendix I). The details of Outcome 1.1 are provided below:

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

This project will improve the management effectiveness of the target protected areas in each country. Real-time situational awareness will assist efforts to protect high-value species of global significance such as rhino and/or elephant and or other rare, endangered, and threatened species vulnerable to commercial-scale poaching. A detailed needs analysis will be conducted for each target protected area to identify fit-for-purpose technology requirements. Activities that will be undertaken to strengthen the institutional and technical capacity of participating countries to effectively manage protected areas include equipment support, installation of appropriate software and associated training for protected area staff. Demonstrative training on the use of the equipment and the associated software will be undertaken during the project period as well as equipment maintenance for three years before full handover to PA management.

**Targets for Outcome 1.1:**

- a. At least 4,901,650 hectares of protected areas with improved METT scores
- b. All the 6 target protected areas in the participating countries utilizing EarthRanger technology to manage the PAs

**Outcome 1.1 will be delivered by the following outputs:**

- **Output 1.1.1:** EarthRanger software incorporated in the existing protected areas 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 EarthRanger technology in each protected area in the target countries.
- **Output 1.1.3:** Required built infrastructure and internet network capabilities installed in the selected protected areas in the target countries.
- **Output 1.1.4:** Digital radio or other appropriate communications network, (as appropriate for the context e.g., LoRa) installed and functional in the selected protected areas in the target countries.
- **Output 1.1.5:** EarthRanger software installed and functional in the selected protected PAs in the target countries.
- **Output 1.1.6:** Protected area management staff trained to utilize EarthRanger software (sensors, radios, satellite collars and other data transmitters).

***Output 1.1.1: EarthRanger software incorporated in the existing protected area management structure in the target countries.*** EarthRanger technology will be integrated in the existing management structures of the selected PAs to enable cost-effective monitoring of protected area management activities, assets, and ecological resources. This output will be delivered by the following activities:

- (i) **Appointment of project management counterpart focal persons at PA level:** The agencies responsible for protected area management in the project participating countries will be engaged through consultations to designate persons from among their staff with the requisite expertise to serve as focal points. The agencies will be encouraged to pay attention to gender inclusiveness when possible.
- (ii) **Detailed sites level assessments for the requirements at each PA:** Each target PA will be assessed to confirm the specific infrastructure requirements, staffing levels, and training needs, to enable effective deployment of the EarthRanger technology. This will be undertaken at the start of the project and preferably in the first and second quarter.

(iii) **Discuss and confirm Terms of Reference for the National Project Steering Committee:** The details of the terms of reference for the National steering committee will be discussed during the inception meeting and also administratively with key stakeholders at the national level with input from AI2 and CI AFD.

(iv) **Establish the National Project Steering Committee in each of the participating countries:**

The process of setting up the Committee will be handled through administrative nomination, and the nominees confirmed during the stakeholder inception workshop. The Committee will be formally established by communication from the line ministry or agency responsible for protected area management in the participating country. Partners will be encouraged to take care of gender inclusiveness during the process of nomination of members of the National Project Steering Committee.

(v) **Support functioning of the National Project Steering Committee in each target country:**

The steering committee is an integral part in linking the project with the existing PA management structures and will meet virtually once a year or as may be required to support project management particularly in harmonizing project implementation in relation to the integration of EarthRanger technology into the existing institutional arrangements. This will be in addition to the project monitoring role of the steering committee outlined in the M&E section. The committee will provide a platform for sharing of lessons learnt from project implementation.

(vi) **Establish and support the functioning of an EarthRanger Working Group**

An EarthRanger Working Group will be established to harmonize approaches to project implementation across the 6 selected protected areas. The members of this group will include Conservation International (CI), AI2, government partners, and non-state executing partners. The project partners will be encouraged to promote gender inclusiveness during the nomination of members that participate in the EarthRanger Working Group. The working group will meet virtually and more regularly than the Steering Committee to ensure proper coordination of project implementation.

(vii) **Develop Guidelines/Standard Operating Procedures (SOPs) for integrating Earth Ranger software and associated technologies:**

This activity will be undertaken collaboratively between AI2, CI AFD, executing partners and the PA management teams in each of the project participating countries. AI2 will offer guidance on the best approaches to utilize the EarthRanger technology in PA management and the participating countries will provide PA realities particularly how linkages with other key stakeholders such as Telecommunication agencies, the Army, Police, PA management agency, and other law enforcement agencies will be operationalized to avoid technical hitches. The SOPs will be used as a training guide and will outline the training methods to be used as well as the tools and materials required. The development of the SOPs will be informed by the findings of site assessments, which will establish the staffing levels and training needs.

***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 the deployment of Earth Ranger technology in each PA in the target countries.*** A functional coordination room will be necessary to host the EarthRanger monitoring unit including the hardware and software. The project aims to strengthen the monitoring capacity of the PA systems through infrastructure establishment and human resource capacity building. This output will be delivered by the following activities:

(i) **Construction (where required) or refurbishment of control room infrastructure which is sufficient for effective 24-hour, 7-day-a-week operations:** This will entail selection of the site for the establishment of the Control Room, working out the required bills of quantities, clearing site, construction (or renovation of an existing structure), the connection of electricity, plumbing, and water supply, and maintenance (quality assurance) and regular supervision. The Ministry in charge of protected area management, in consultation with the PA management teams, executing partners, AI2 and CI AFD will be responsible for the hiring of the contractors through the appropriate procurement process.

(ii) **Procurement and Installation of the necessary computer hardware in each control room:**

Two (2) Personal Computer (PC) towers with associated hardware and software will be procured and installed in each room in the selected Protected Areas, one for the EarthRanger, and the other for the digital radio management system. Procurement of the right specifications is very important and will be

taken into account. AI2 will provide technical assistance in specifying the hardware requirements. This activity may be undertaken by a contractor with the requisite expertise and experience and the process overseen by AI2.

(iii) **Installation of comfort accessories as required in each control room (e.g., toilet facilities, air conditioner, ventilation):** The control room will be fully furnished with the necessary facilities.

(iv) **Maintenance of the control room and installations:** After the demonstrative capacity building has been completed, the equipment will be handed over to the PA staff. Necessary routine maintenance must be undertaken to ensure the proper functioning of the technology and the sustainability of the operations. Therefore, after the first three years of Project implementation, the PA staff will take on the responsibility of routine maintenance of the control room and the installations through the established institutional framework and budgetary support. The PA management agencies will be encouraged to ensure gender inclusiveness among the control room staff to take advantage of the variation in skills of both men and women in equipment maintenance activities.

(v) **Safeguard compliance:** A safeguards expert will be engaged to provide services before and after the construction at each selected sites. The expert will be responsible for ensuring the project complies with the safeguard's requirements. This will entail setting up the safeguard plans; implementation of the safeguards; monitoring and reporting on safeguard indicators. The safeguards compliance officer will be supported by each protected area (PA) focal point at the PA level. S/he will undertake site assessments and facilitate any mitigation requirements at each site.

**Output 1.1.3: Required built infrastructure and internet network capabilities installed in the selected protected areas in the target countries.** In order to strengthen monitoring of protected areas management and ecological activities, clear coverage of the ecosystem is necessary. This output will be delivered by the following activities:

(i) **Review and confirm the infrastructure requirements, internet network needs, and associated software for each selected PA:** This activity, which begins during the PPG phase and continues during project implementation, is undertaken as part of the detailed site assessments to enable a clear understanding of the PA's needs. The activity includes determining the sites for the establishment of outposts/repeater stations and putting in place the operational modalities at each repeater station.

(ii) **Establishment of repeater stations:** following the site assessments to determine the appropriate numbers and locations of repeater stations, masts will be constructed at the selected locations in each of the selected protected areas on which radio, LoRa, or internet repeaters will be installed.

(iii) **Installation of the required hardware to enable suitable network capabilities for reliable access to the internet.** This activity will include procurement of the required hardware and software and their installation and signing contracts with internet service providers for up to 3 years to provide technical support. User-friendly technical guidelines will be developed to promote proper use of the installed equipment, PC hardware, and associated software for repeater stations.

(iv) **Connect outposts to the control room:** this activity will include contracting of reliable internet service providers, and connection of both the physical infrastructure as appropriate, as well as the software to link the control room to outposts/repeater stations.

(v) **Implementation of Safeguards:** A safeguards compliance officer, supported by each protected area (PA) focal point at the PA level, will undertake site assessments and facilitate any mitigation requirements for each of the activities as may be appropriate. This may include setting up detailed safeguard plans as may be required; implementation of the safeguards; monitoring and reporting on safeguard indicators.

**Output 1.1.4: Digital radio or other appropriate communications network (as appropriate for the context e.g., LoRa) installed and functional in the selected protected areas in the target countries.**

Digital radios are an important component for ensuring the functionality of the EarthRanger technology. The following activities will deliver output 1.1.4:

(i) **Review and confirm the need for the two-way digital radio networks or other appropriate communication networks for each selected PA:** Connectivity is key to the effective

functioning of the EarthRanger technology and for efficient monitoring of the protected areas. The assessment will explore the coverage of digital radio and any other appropriate communication such as LoRa network. The process will be led by the project participating country and supported by AI2.

(ii) **Installation of digital radio communication or other communication systems suitable for the environment of the selected protected area:** Two-way digital radio communication equipment (or other suitable communication systems) will be procured and installed in each selected PA to enable reliable voice communication on hand-held, vehicle-based, and base-station radios to support live tracking of personnel, assets and real-time SOS function. A LoRa WAN system will be installed in cases where it is required to support the flow of data in real-time from the field and to ensure proper coverage of each selected protected area.

(iii) **Procurement and installation of sensor and tracking technologies that are fit-for-purpose for a particular protected area to detect illegal activities and/or monitor key wildlife species or other assets.** Appropriate equipment such as camera traps and radio accessories will be procured to enable data collection, transmission and ensure connectivity for effective functioning of the EarthRanger technology and subsequent monitoring of the protected areas.

(iv) **Test and commission the communication network for each selected PA in the Project participating countries:** All the installations will be tested to ensure effective performance and commissioned for operations.

(v) **Maintain/service the communication network equipment for each selected PA:** The network equipment will be regularly maintained and serviced for a period of up to 3 years and handed over to the PA management authorities with technical manuals and guidelines (Standard Operating procedures-SOPs) to ensure efficient functioning and sustainable use of the network in protected area management.

***Output 1.1.5: EarthRanger software installed and functional in the selected PAs in the target countries.*** EarthRanger software will be installed on designated computers in each Control Room of the target protected area sites. This output will be delivered by the following activities:

(i) **Review and confirm the requirements for EarthRanger software installation for each selected PA:** Assessments will be undertaken in each PA for the necessary requirements.

(ii) **Installation of the EarthRanger software on the control room computer equipment as an aggregator of real-time data feeds:** This will entail procurement of the EarthRanger software and installing them on the computer in the Control room.

(iii) **Testing and commissioning the EarthRanger equipment and software:** This will also entail aggregation of open-source data feeds on EarthRanger to improve management decision-making, (e.g., NASA FIRMS to track the occurrence and spread of fires).

(iv) **Maintain/service the EarthRanger software and associated equipment for each selected PA:** Maintenance and service to ensure that EarthRanger software and associated accessories function effectively will be undertaken by the respective countries. This will ensure sustainability. Initial service support will be provided by AI2 as part of capacity building.

***Output 1.1.6: Protected area management staff trained to utilize Earth Ranger software (sensors, radios, satellite collars, and other data transmitters).*** Training is intended to build capacity and enhance knowledge at national and protected area levels for effective EarthRanger use in decision making and taking immediate response actions. The training guide and the associated methods and tools/material will be developed under output 1.1.1 - activity (vii). Trainings will be undertaken by service providers of sensors, radios, collars, other data transmitters, the Internet, computer hardware, or LoRa networks. Where available, local support agencies will provide the training managed by the PA authorities. AI2 with support from CI-AfFD as executing support partner will train and support the usage of EarthRanger and its integration with other technologies. At least two (2) trainings will be conducted for each PA; one for managers/senior-level officers targeting relevant Ministries, Departments, and Agencies; and another for field staff targeting field patrol teams and community-based conservation wardens. This output will be delivered by the following activities:

(i) **Identify the key staff for training:** Appropriate staff will be identified and a total of at least six (6) national capacity building trainings will be undertaken during the project period. The persons will be trained and equipped with additional knowledge and skills for utilizing the EarthRanger technology and ensuring its effective performance in monitoring wildlife, assets and activities in the protected area. The capacity gaps assessment will be undertaken to inform capacity building of PA management persons through a combination of methods including short-term training and practical demonstrations of the EarthRanger technology. At least four staff at managerial level (at least two (2) per country from the relevant Ministry, Department or agency responsible for wildlife management; two (2) management staff from the selected PA) and three (3) field staff. The PA management agencies will be encouraged to ensure gender inclusiveness during the nomination of staff for the training to take advantage of the variation in skills of both men and women in the subsequent implementation of activities.

(ii) **Conduct a baseline gender assessment of PA rangers in project sites.** This will need a small budget attached to allow for 3 focus groups + 10 key informant interviews. The output is a report to guide targets and engagement. I've highlighted this in yellow in the GMP.

(iii) **Training of management and control room staff on all technologies that are deployed in a particular protected area:** Capacity building trainings on EarthRanger will be undertaken demonstratively to impart practical hands-on skills to the management staff and control room staff to enable them to manage the EarthRanger and related technologies for improved protected area management. Competent and knowledgeable staff will be able to collect, process, interpret and disseminate real-time information to address the key challenges of the protected areas, as well as supervise and guide the field staff. The Training sessions will also serve as a Training of Trainers (ToT) to create a pool of knowledgeable staff that will build the capacity of other staff. The PA management agencies will be encouraged to ensure gender inclusiveness during the trainings to take advantage of the variation in skills of both men and women in the subsequent implementation of activities. The trainings will be separately conducted at all the selected PAs in each participating country, with each training event drawing together the management staff (at least two per country from the relevant Ministry, Department or Agency responsible for wildlife management; two management staff from the selected protected area (including the project focal person at PA level) and three (3) staff assigned to manage the Control Room. **A target of 42 trainees (36 Male; 6 Female) is envisaged by the end of the project.**

(iv) **Conduct demonstrative training of PA field staff:** the field staff play important roles in patrols, field surveillance and monitoring of criminal activities and wildlife, data collection, response to illegal activities, and interfacing with local communities. The application of the EarthRanger and related technologies will enhance the capacity of staff to detect and respond in real-time to any suspicious activities observed in the field. The training will prepare them to effectively use the various digital radio or other appropriate communications networks, including sensors, radios, satellite collars, and other data transmitters for surveillance and monitoring. The PA management agencies will be encouraged to ensure gender inclusiveness during the nomination of staff for the training to take advantage of the variation in skills of both men and women in the subsequent implementation of activities. The beneficiaries for this training will include at least 20 field staff per selected PA, consisting of field patrol team and community-based conservation personnel: **a target of at least 120 trainees (102 Male; 18 Female) is envisaged by the end of the project.**

(v) **Support the trained staff on hands-on implementation:** Whereas the demonstrative training will have been undertaken, staff will be supported further by providing them with the hands-on practical implementation of the technology as they undertake field operations. This will ensure that field operations are carried out more smoothly with the new technology and thereafter contribute to sustainability as well.

Component one will be implemented largely through grantees or service providers and coordinated by CI AfFD with support from the Allen Institute for Artificial Intelligence (AI2).

**Component 2: Learning, knowledge sharing and scaling the EarthRanger technology across Africa**

This component seeks to increase uptake and enhance awareness about the benefits of utilizing conservation technologies ? in this case, Earth Ranger technology ? in protected areas management. It is anticipated that through the dissemination of Earth Ranger?s success stories, other African countries will develop interest to install and use EarthRanger and related conservation technologies to manage their protected areas. The component consists of one Outcome described below.

***Outcome 2.1: Additional PAs in Africa are identified and the respective Countries commit to install the EarthRanger technology***

The main activities under this outcome focus on sharing of project?s lessons and success stories through visits (EarthRanger User Conferences) and dissemination of information about the EarthRanger technology through various modes of communication. Success stories and lessons learnt from this project will be disseminated through the AI2 EarthRanger website, <https://earthranger.com/Success-Stories.aspx> . The project will also explore the potential of various national-level platforms and regional platforms, such as Southern African Development Community (SADC) Newsletter, <https://www.sadc.int/news-events/newsletters/> and the global platforms such as the Knowledge Sharing Platform of the GEF-World Bank Global Wildlife Program (GWP), to share best practices and lessons learned. SADC Secretariat produces a monthly newsletter, *Inside SADAC*?, which could be utilized to share experiences and good practices to benefit the countries within and beyond the region. GWP has been instrumental in tackling the wildlife issues of poaching and illegal wildlife trade in countries of Asia and Africa (Botswana, Mozambique, and Republic of Congo inclusive) and coordinating outreach with partners, collaborators, and donors. The Project will also take advantage of any other social media platforms and other media outlets as they unveil during implementation.

**The target for Outcome 2.1:**

- a. At least 6 new PAs identified, and 3 African countries committed to install Earth Ranger Technology in GEF8

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

- **Output 2.1.1:** Annual learning and knowledge sharing event (EarthRanger User Conference) undertaken by each PA
- **Output 2.1.2:** Information sharing events undertaken to enhance learning and promote scaling up.
- **Output 2.1.3:** Success stories, lessons learnt and best practices published and shared on blogs, websites, and other digital platforms (*where the EarthRanger software informed decisions in management effectiveness of protected areas*).

***Output 2.1.1: Annual learning and knowledge sharing event (EarthRanger User Conference) undertaken by each PA***

The use of the EarthRanger technology in promoting management effectiveness of protected areas is progressively taking root on the African continent, for instance, it is already being implemented in countries such as Kenya, Rwanda, Tanzania, and Malawi among others. Efforts will be directed towards fostering partnerships among expertise and facilitating exchange visits to further increase the uptake of the technology. This output will be delivered through the following activities:

- (i) **Promote use of virtual knowledge exchange platforms:** Encourage the project countries to participate in exposure opportunities e.g., EarthRanger User Conference. EarthRanger awareness opportunities are proposed under this component to share knowledge and skills required for enhancing use of the EarthRanger technology. The scope of the opportunities may be broadened to include other sectors as requested by the participating countries. Opportunities include promoting the use of virtual knowledge sharing platforms that will enable protected area managers from other countries to access information on the application of the EarthRanger technology. The exposure opportunities will illuminate interests, kindle commitments to adopt new approaches for protected area management and

lay a foundation for future networking. The objective is to increase EarthRanger technology adoption for improved protected area management in the project countries as well as other countries by learning from experiences shared on the platforms. It is anticipated that this will make the peers realize their capacities and management skills gaps and stimulate interest to adopt the EarthRanger technology for improved protected area management.

(ii) **Consolidate commitment of African countries to utilize EarthRanger Technology:** This will include holding virtual dialogues within the project participating countries as well as other African countries on the use of the EarthRanger and related technologies in PA management. Where interest has been generated to utilize the technology, further engagements will include soliciting endorsement letters (and possibly co-financing promises) to accelerate the introduction of the EarthRanger technology to other protected areas. This includes possibility of scaling up in the project participating countries when they express a need to deploy ER in new PAs. The potential for the existing participating countries; Botswana, Republic of Congo or Mozambique choosing to deploy ER in another PA in GEF 8 will be explored as well as interest expressed by other African countries.

***Output 2.1.2: Information sharing events undertaken to enhance learning and promote scaling up.***

Regular information sharing will help to enhance awareness on the use of the EarthRanger technology for improved PA management as well as build capacity and appreciation of the importance of the EarthRanger. Deliberate efforts will be directed to promoting information-sharing events within and between the participating countries and possibly with other African countries. Where COVID-19 pandemic Standard Operating Procedures (SOPs) permit, learning visits will be arranged to protected areas where the technology is functional and being effectively used. In addition, sharing of lessons and best practices from those who have used and/or are using the technology will be promoted through effective documentation and virtual workshops. Technology soft and hardware/equipment and accessories required by focal persons will be provided to bolster their capacity. This output will be delivered through the following activities:

(i) **Attending Annual Regional EarthRanger User Conference:** AI2 holds regular conferences to share experiences on the use of EarthRanger technologies in protected area management. PA management staff from the participating countries will be facilitated to attend the conferences for information and knowledge exchange to enhance capacity in the use of the technology. The PA management agencies will be encouraged to ensure gender inclusiveness during the nomination of staff that participate in the annual EarthRanger user conference to take advantage of the variation in skills of both men and women in the subsequent implementation of activities. Two persons from each protected area will be supported per year. The EarthRanger Working group under this project will have the opportunity to meet physically during this conference.

(ii) **Hold virtual annual national and regional events on Earth Ranger experience:** Each of the target countries will hold an annual event for information sharing in the country to discuss progress and lessons learnt in the implementation of the EarthRanger technology. A regional event will then be held and attended by participants from the project participating countries to promote regionalism in improved PA management as well as invite any other African countries to enhance learning and popularize the EarthRanger technology for uptake. The PA management agencies will be encouraged to ensure gender inclusiveness during the nomination of staff for the annual national and regional events on sharing experiences on the use of EarthRanger technology. Holding experience sharing and capacity building events will contribute to enhance effective and timely documentation and reporting.

(iii) **Regional Women's ranger learning/knowledge exchange summit.** The project will organize a separate, regional 'women's rangers' summit', focused on bringing together the women rangers from all project sites. This will be an opportunity to 1) create a safe space for women rangers to learn from each other, share experiences, and challenges that they face as women rangers, ultimately creating a network that can support each other, and 2) demonstrate that the GEF/CI/AI2/the partners truly want to support women in this field of work.

***Output 2.1.3: Success stories, lessons learnt and best practices published and shared on blogs, websites and other digital platforms (where the Earth Ranger software informed decisions in management effectiveness of PAs).***

A success story in the context of this project is an account of the achievement of success by the EarthRanger project. It will be an important marketing tool for the EarthRanger project directed towards other protected areas to consider using the technology for improved protected area management. The success stories will provide practical examples and real-time experiences in the use of the EarthRanger technology in protected area management. This output will be delivered through the following activities:

**(i) Develop the capacity of PA staff for effective documentation and digital information**

**sharing:** This activity will involve capacity building events to enhance effective and timely publications of e.g., Newsletters, reports, fact sheets, and at least one short film capturing the impact of the project. The development of a project success story will benefit from this capacity enhancement approach. The PA management agencies will be encouraged to ensure gender inclusiveness during the nomination of staff to participate in the capacity-building sessions for enhancement of documentation and digital information sharing to take advantage of the variation in skills of both men and women in the subsequent implementation of activities. Local expertise will be procured to facilitate the write shops and accordingly enhance documentation.

**(ii) Prepare and disseminate an article that highlights 1-2 women who have benefitted from the project (and the targeted efforts of the project to support women in this field).**

**(iii) Document progress of Earth Ranger application experience** (Newsletters, fact sheets, brochures, short film, etc.): Newsletters, fact sheets, and a short film will be useful in information sharing during peer exchange visits and study visits. Quarterly newsletters and periodic fact sheets will be developed by project management to ease sharing of experiences.

**(iv) Protected area Management Authorities to upload Earth Ranger experiences on their websites as appropriate:** The developed publications will be uploaded on blogs and websites as appropriate.

**(v) PA partners to upload Earth Ranger application experiences onto their websites as appropriate:** Other partners will also be supported to participate in information sharing through the uploading of the lessons learned from the project, reports, newsletters, presentations, social media, and factsheets onto their websites and blogs.

This component will build from a baseline of existing country capacities identified through an assessment.

### **Component 3: Monitoring and Evaluation**

Setting up a project Monitoring and Evaluation framework will enhance transparency and accountability; ensure effective resource allocation, provide quantifiable results that will promote adaptive management through learning from project successes and challenges; Improve project performance by tracking indicators, and identifying effective tools to measure and analyze the progress of the interventions, as well as the progress made towards achieving the target outputs and outcomes. As part of M&E, the project will submit periodic technical and financial reports to the CIGEF Agency. Additionally, the CIGEF Agency will undertake a Mid Term Evaluation and Terminal Evaluation of the project.

#### ***Outcome 3.1: An integrated monitoring and evaluation framework for the project***

Progress reports will be developed and shared with stakeholders. Both mid-term and end-term evaluations will be undertaken by external evaluators to ensure objectivity and accountability to stakeholders.

#### **79. Targets for Outcome 3.1:**

- a. Periodic technical and financial reports submitted to CIGEF (*3 Annual Workplans and Budget, 12 Quarterly Reports, 3 Annual Progress Implementation Reports (PIRs)*).
- b. At least two (2) Evaluations conducted by CIGEF: Mid-Term Evaluation and Terminal Evaluation

**Outcome 3.1 will be achieved through the following outputs:**

- **Output 3.1.1:** Periodic M&E reports submitted to CIGEF Agency
- **Output 3.1.2:** Mid-Term Evaluation and Terminal Evaluation conducted by CIGEF.

***Output 3.1.1: Periodic M&E reports submitted to CIGEF Agency.***

A systematic monitoring and evaluation of project activities is important for the success of the project. Efforts will be directed towards ensuring timely internal monitoring by project stakeholders and external evaluation by expertise. This output will be delivered through the following activities:

- (i) **Inception Workshop and Reporting:** A workshop will be held at the project start-up to obtain a common understanding of the implementation approaches, activities to be undertaken, and expected deliverables. An inception report will be prepared and shared with key project implementation partners.
- (ii) **Internal project progress monitoring:** The project's progress will be monitored internally by the project management and periodic progress reports prepared and shared with key stakeholders. The activity will also entail preparation of work plans and quarterly progress reporting.
- (iii) **Discussion and refinement of the M&E Plan:** The project management team will initially review the project M&E plan to allocate clear roles for each implementation partner. This will then be integrated in the annual work plans and budgets and reviewed for effective implementation. The objective of this activity is to improve project implementation and ensure improved protected area management in the project countries.
- (iv) Information collection and synthesis on M&E Indicators (M&E plan)
- (v) Annual progress and implementation reporting (APR/PIR)
- (vi) Project Steering Committee Meetings (bi-annually)
- (vii) CI-GEF Project Agency Field Supervision Missions
- (viii) Project completion report
- (ix) Financial Statements Audit

***Output 3.1.2: Mid-term Evaluation and Terminal Evaluation conducted by CIGEF***

The CIGEF Agency will source external expertise to undertake the mid-term review and end term project evaluation. A mid-term review report will be prepared and will assist in identifying areas for improvement while the end term evaluation report will provide lessons for future project implementation and out scaling. This output will be achieved through implementation of the following activities

- i) **Conduct a mid-term review of the project.** The mid-term review will be commissioned by CI-GEF to assess project progress and the criteria used to judge the interventions leading to the required deliverables e.g., efficiency of activity implementation based on work plan and budget. The CIGEF Agency will source external expertise to undertake both the mid-term review and end term project evaluation. A mid-term review will be conducted after two years of project implementation. The review will be carried out in a participatory manner, involving key stakeholders from government agencies, civil society organizations, the private sector and community-based organizations. The recommendations from the mid-term review will guide any adjustments to be made to ensure effective project implementation.
- ii) **Conduct a terminal evaluation of the project.** A terminal evaluation will be conducted within three months after the end of the project to document best practices and lessons learnt. The evaluation report will inform future project design and implementation, including the envisaged scaling up of similar initiatives in other African countries.

This component will build on the project monitoring and evaluation framework presented in Appendix III of this Project Document.

4) Alignment with GEF Focal Area and/or Impact Program Strategies

**Consistency with GEF Focal Area and/or Fund(s) Strategies**

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.

Improved management effectiveness is essential for protected areas to persist as reservoirs of biodiversity. Deployment of tested technologies such as EarthRanger represents a cost-effective means to amplify management capabilities through improved real-time data collection, analysis, and the creation of situational awareness. Additional co-benefits of the EarthRanger technology deployment include improved voice communications, data transmission, data storage, and data analytics. **Table 5** further shows how this project is aligned with the GEF- Programming directions.

**Table 5: Alignment with the GEF-7 focal area Strategies**

GEF-7 Focal area strategy	GEF-7 Delivery Mechanism ( <i>Focal Area Investment</i> )	The Proposed project
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GEF-7 Focal area strategy	GEF-7 Delivery Mechanism ( <i>Focal Area Investment</i> )	The Proposed project
<p><b>Biodiversity Goal:</b> to maintain globally significant biodiversity in landscapes and seascapes.</p> <p><b>Objective II:</b> Address direct drivers to protect habitats and species</p> <p>Enhance the effectiveness of protected area systems</p> <p><b>BD-2.7:</b> Address direct drivers to protect habitats and species and</p> <p>Improve financial sustainability, effective management, and ecosystem coverage of the global protected area estate</p>	<p>Improving Financial Sustainability, Effective Management, and Ecosystem Coverage of the Global Protected Area Estate</p>	<p><b>Objective:</b> To strengthen management effectiveness of priority Protected Areas (PAs) in Africa to deliver Global Environmental Benefits through the deployment of the EarthRanger Protected Area Management system.</p> <p><b>Outcomes:</b></p> <p>Outcome 1.1: Strengthened institutional and technical capacity of participating countries to effectively manage protected areas</p> <p>Outcome 2.1: Additional PAs in Africa are identified and the respective Countries commit to install the Earth Ranger technology.</p> <p>Outcome 3.1: An integrated monitoring and evaluation framework for the project</p>

### Linkages with other GEF Projects and Relevant Initiatives

The section describes how the EarthRanger project will coordinate with other ongoing GEF projects in the same region of a similar thematic area. **Table 6** indicates projects at global, regional, and national levels that offer relevant linkages to this Earth Ranger deployment project.

**Table 6: Other Relevant Projects and Initiatives**

GEF Projects Other Projects/Initiatives	Linkages and Coordination
<b>A. Global GEF projects operating in the focus countries</b>	
<p>Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development Program (GWP) ? with programs in Botswana, Mozambique and the Republic of Congo:</p> <p>? Botswana: ?<i>Managing the Human-Wildlife Interface to Sustain the Flow of Agro-Ecosystem Services and Prevent Illegal Wildlife Trafficking and in the Kgalagadi and Ghanzi Drylands?</i> ? implemented in Kalahari Savannah ? Central Kalahari Game Reserve (CKGR) and the Kalahari Transfrontier Park (KTP); Kgalagadi/Ghanzi drylands in western and south-western Botswana; Orange-Senqu Transboundary River Basin; Ngamiland</p> <p>? Mozambique: ?<i>Strengthening the Conservation of Globally Threatened Species in Mozambique Through Improving Biodiversity Enforcement and Expanding Community?</i> ? implemented in Gorongosa National Park (Gorongosa-Marromeu Complex); Niassa Reserve; Pungue - DinguéDingué Community Conservancy; Northern Rift Valley Community Conservancy; Cheringoma Sub-Complex of Conservancy;</p> <p>? Republic of Congo: ?<i>Integrated and Transboundary Conservation of Biodiversity in the Basins of the Republic of Congo</i></p>	<p>The project provides support and capacity building at the country, regional, and global level to enhance management of PAs and wildlife crime prevention (focusing on combating wildlife poaching, trafficking, and demand) and thus provides great leverage to the EarthRanger project that is targeting management effectiveness through ecological monitoring and addressing threats to wildlife. The Earth Range project builds and benefits from the experiences of the Global partnership project, especially for capacity building and information sharing. The learning and coordination platform under GWP that was established for mitigating illegal wildlife trade will benefit the EarthRanger Project through data generation and information sharing.</p>
<p>Biodiversity and Protected Areas Management Programme (BIOPAMA)</p>	<p>This program is aimed at improving long-term conservation and sustainable use of biodiversity and natural resources in protected areas and the surrounding communities in African, Caribbean, and Pacific (ACP) countries. The program aims at strengthening on-site infrastructure/equipment for patrolling, poaching control, developing the capacity of staff). Through its Reference Information Systems (RRIS) tool, information from the many knowledge products, projects, databases on protected areas, species, and related information, is gathered in one place, including the data uploaded, created and generated by the users themselves. The Earth Ranger project will provide the opportunity for countries to learn about the importance of utilizing technology for effective wildlife monitoring and there is great opportunity to have cross learning with BIOPAMA. Lessons learnt from BIOPAMA will be utilized to enhance effective project management of the EarthRanger project.</p>

GEF Projects Other Projects/Initiatives	Linkages and Coordination
Sustainable Forest Management Impact Program on Dry-land Sustainable Landscapes	The project was to support the countries Angola, Botswana, Burkina Faso, Kazakhstan, Kenya, Malawi, Mongolia, Mozambique, Namibia, Tanzania and Zimbabwe to avoid, reduce, and reverse further degradation, desertification, and deforestation of land and ecosystems in dry-lands through the sustainable management of production landscapes. In particular, the project supported Mozambique to actively engage in the Miombo Network to revitalize and strengthen key TFCAs to preserve trans-boundary ecosystems, including the Limpopo National Park. The Earth Ranger will build on the achievements in capacity building and coordination efforts.
<b>B. Regional GEF Projects supporting the project countries</b>	
<p><b>Title of Project:</b> Global Partnership on Wildlife Conservation and Crime Prevention for Sustainable Development Program</p> <p><b>Project Location:</b> Afghanistan, Botswana, Republic of Congo, Cameroon, Ethiopia, Gabon, Indonesia, India, Kenya, Mali, Malawi, Mozambique, Philippines, Thailand, Tanzania, Viet Nam, South Africa, Zambia, Zimbabwe</p> <p><b>Duration:</b> 2015 ? 2022</p> <p><b>Description:</b> This regional project covers three countries namely, Botswana, Congo and Mozambique. 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.</p>	<p>The EarthRanger Project will build on and learn from this World Bank Group's global coordinating project which establishes a learning and coordination platform to promote enhanced Illegal Wildlife Trade (IWT) interventions and increase technical capabilities.</p> <p>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 (ICWC) 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)[1].</p>

GEF Projects Other Projects/Initiatives	Linkages and Coordination
<p><b>Title of Project:</b> Support to Eligible Parties to Produce the Sixth National Report to the CBD (Africa-1)</p> <p><b>Project location:</b> Burundi, <u>Botswana</u>, Central African Republic, <u>Republic of Congo</u>, Djibouti, Eritrea, Ethiopia, Gabon, Kenya, Comoros, Rwanda, Sudan, South Sudan, Chad, Tanzania, Uganda, Congo DR</p> <p>The project provides 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; 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.</p>	<p>The information and experiences from the EarthRanger project will benefit the preparation of more accurate national reports and thus inform stakeholders to ensure improved national decision-making processes for the implementation of NBSAPs.</p>
<p>Integrated Trans boundary River Basin Management for the Sustainable Development of the Limpopo River Basin</p> <p><b>Project location:</b> <u>Botswana</u>, <u>Mozambique</u>, South Africa, Zimbabwe</p> <p>The project, aimed at promoting sustainable development in the Limpopo River basin through Integrated Water Resources Management (IWRM) at the trans boundary, national, and local scales to balance environmental, social and economic benefits provides some lessons for the EarthRanger project.</p>	<p>This project, which is now closed, provides lessons to implementation of the EarthRanger project. This EarthRanger project will build on the achievements of the closed trans boundary project, particularly with respect to information as well as experience sharing.</p> <p>The Limpopo National Park which is one of the focus sites of the EarthRanger Project is part of the Great Limpopo Transfrontier Park, comprising the Kruger National Park in South Africa, the Limpopo National Park in Mozambique, and the Gonarezhou National Park in Zimbabwe. There is thus a great opportunity for the EarthRanger project to build on the achievements of the Trans boundary river basin project.</p>
<b>C. National GEF Projects in the Focus Countries</b>	
<b>Botswana</b>	
<p>Managing the Human-Wildlife interface to sustain the flow of Agro-ecosystem services and prevent illegal wildlife trafficking in the Kgalagadi and Ghanzi dry lands (Global Wildlife Program)</p>	<p>The project is still under implementation and key linkages will be on landscape planning and integrated sustainable management; development and implementation of national strategy for combating wildlife crime (Capacity building, inter-agency collaboration and local level participation). While the Earth ranger will focus on combating crime, this will feed into better coordination.</p>

GEF Projects Other Projects/Initiatives	Linkages and Coordination
Bio-methane Project in Southeastern Botswana	The project is still under implementation phase. The overall objective of the project is to facilitate low carbon investment and public-private partnerships in the production and utilization of bio-methane from agro-waste (for substitutes to LPG and diesel) in Southeastern district of Botswana. One of the project components is institutional and private-sector strengthening and capacity development for biogas technology development and servicing and improvement of agro-waste management and regulation through awareness-raising, training and dissemination sessions. The EarthRanger project will build on the project, ensuring efficient use of resources and avoid duplication of efforts.
Renewable Energy-Based Rural Electrification Programme	The project closed. The global objective of the project was to reduce the emission of greenhouse gas (GHG) in the Botswana power sector by removing the barriers for large-scale dissemination of solar photovoltaic (PV) technology. The data from the project outcome is an essential input to the MRV system.
Botswana's Third National Communication (TNC) to the UNFCCC and First Biennial Update Report (FBUR)	Component of EarthRanger project shall aim to strengthen capacities for PA data collection, processing and reporting to respond to crime and the national and international reporting requirements.
Incorporating Non-Motorized (NMT) Transport Facilities in the City of Gaborone	The aim of the project was to mitigate greenhouse gas emissions in the urban transport sector by enhancing a modal shift from motorized transport to non-motorized transport. The data from the project outcome is an essential input to the MRV system.
Building Core Capacity for the Implementation, Monitoring and Reporting of Multilateral Environmental Agreements (MEAs) and Relevant Sustainable Development Goals (SDGs) in Botswana.	The overall objective of the project was to strengthen national capacity for environmental information and knowledge management for implementation, monitoring and of Multilateral Environmental Agreements (MEAs) and relevant Sustainable Development Goals (SDGs) in Botswana. Most of the Earth Ranger project stakeholders were trained under the MEAs project, hence the skill gained during the project will be useful for the success of the EarthRanger project.
<b>Mozambique</b>	
Title of Project: Integrated Trans boundary River Basin Management for the Sustainable Development of the Limpopo River Basin	The EarthRanger project complements the Limpopo River Basin Management since it will facilitate monitoring of activities implemented by the staff of the Park allowing more data and information to be processed and collected.

GEF Projects Other Projects/Initiatives	Linkages and Coordination
<p>Title of Project: Strengthening the conservation of globally threatened species in Mozambique through improving biodiversity enforcement and expanding community conservancies around protected areas.</p> <p>The major objectives under this project include:</p> <ul style="list-style-type: none"> <li>-National strategy to promote the value of wildlife and combat illegal wildlife trafficking</li> <li>-Strengthen enforcement capacity in key protected areas</li> <li>-Establish conservancies to expand the Gorongosa Protected Area</li> </ul>	<p>These projects complement each other as the EarthRanger project supports the capacity building for monitoring activities in the protected areas and builds capacity also at the ANAC - the administration capacity needed for effective coordination.</p> <p>Lessons learnt in implementation of the project will benefit the EarthRanger project particularly with respect to strengthening enforcement capacity at protected area level.</p>
<p>Mozambique Conservation Areas for Biodiversity and Development (MOZBIO)</p>	<p>The project is intended to increase effective management of conservation areas and enhance living conditions of the adjacent local communities. By improving protected area management, the project aims to reduce poaching, wildlife and forest related crimes, and illegal wildlife trade. The EarthRanger project will leverage interventions on human resource management and improvements with Limpopo and Zinave which are also target sites by the MOZBIO initiative ? there is thus an opportunity to establish synergies, collaboration and benefit from lessons learnt.</p>
<p>The Kheta Project, implemented by the governments of Mozambique and South Africa by the Department of Environmental Affairs (DEA), South African National Parks (SANParks), the National Administration of Conservation Areas (ANAC) and the Attorney General's Office in Mozambique (PGR) is aimed at addressing the continued decline of Africa's elephant and rhino populations due to wildlife trafficking.</p>	<p>This project is implemented in the Limpopo Transfrontier Park and thus provides some great lessons for the EarthRanger project particularly with respect to information sharing in the effective enforcement of anti-poaching and illegal wildlife trade.</p>
<b>Republic of Congo</b>	

GEF Projects Other Projects/Initiatives	Linkages and Coordination
<p>Integrated and Trans frontier Conservation of Biodiversity in the North Congo Basins</p> <p>The objective is to strengthen the efficiency of PAs through the operation of peripheral buffer zones and biological corridors for the interconnection of protection nuclei North Congo in the departments of Cuvette, Cuvette Ouest and Sangha. The project covers a total area of 1,533,600 ha including the Odzala-Kokoua National Park (1,354,600 ha), the Lossi Gorilla Sanctuary (35,000 ha) and the creation of Messok -Dja PA on 144,000 ha.</p>	<p>The Integrated and Trans frontier Conservation of Biodiversity in the North Congo Basins project is implemented in the Odzala-Kokoua National Park and thus provides an opportunity for the EarthRanger Project to utilize lessons from its implementation as well as collaboration in supporting enforcement and enhance community collaboration in the buffer zones and biological corridors.</p>
<p>North Congo Forest Landscape Project (PPFNC)</p> <p>The aim is to ensure the maintenance of ecological continuums and preservation of biological diversity in the territories of the North of Congo by supporting socio-economic development and a rational planning of the territory.</p>	<p>This project is implemented in the north Congo, particularly in Likouala, Sangha and Cuvette West on an area of 9.5 million ha. As the focus of the project is on maintaining ecological integrity and conservation of biodiversity, there is great opportunity for collaboration with the EarthRanger project especially in addressing community ?wildlife conflicts and reduction of threats to biodiversity resources. The project covers a large area where local communities and indigenous peoples live along logging sites, PAs and agricultural and mining concessions and thus any threats in such areas that may be captured by the EarthRanger project would benefit from linkages with this project to ensure effective enforcement particularly in addressing issues of poaching.</p>
<p>The Congo Conservation Company initiative</p> <p>This initiative works on development of village lands and improvement of the conditions of local communities and indigenous peoples (CLPA) through ecotourism.</p>	<p>The Congo Conservation Company initiative works in North Congo in the departments of Cuvette Ouest, Likouala at the peripheries of Odzala-Kokoua and Nouabal?- Ndoki national parks. There is therefore an excellent opportunity for the EarthRanger project to collaborate with this initiative to support effective enforcement of monitoring threats to Odzala-Kokoua and Nouabal?- Ndoki national parks, especially with respect to poaching and illegal trade in wildlife products.</p>
<p>Inventory and field tests for deployment of IT Legality Verification System (SIVL) with stakeholders.</p> <p>This is an FAO-EU FLEGT initiative whose aim is to monitor and mitigate deforestation in forest management units (FMUs) granted to logging concessionaires.</p>	<p>The linkage of the EarthRanger Project with this initiative will mainly be information sharing as the focus is on traceability of forest products and control of logging. Experience in tracking forest products may be shared to enhance management effectiveness of the target protected areas.</p>

GEF Projects Other Projects/Initiatives	Linkages and Coordination
<p>Strengthening the Management of Wildlife and Improving Livelihoods in Northern Republic of Congo</p> <p>The project seeks to Increase the capacity of the forest administration, local communities and indigenous peoples to co-manage forests. It is a national GEF project whose three components are located in a primary project of the World Bank called `` Forest and Economic Diversification Project (PFDE) ".</p>	<p>There is great opportunity for linkages and for EarthRanger project to be leveraged by this initiative as its objective is to provide support for the national anti-poaching strategy particularly to</p> <p>[GU1] Ntokou-Pikounda, specifically improving the management effectiveness of Ntokou Pikounda National Park to enhance habitat and biodiversity conservation, and to support eco-tourism activities in the southern ring road of Nouabal? -Ndoki National Park). The EarthRanger work in Nouabal? -Ndoki will thus benefit from this project activities. The co-management aspects with local communities and indigenous peoples of the initiative will enhance the Earth Ranger?s project implementation.</p>
<p>Support for conservation and sustainable management of biodiversity in the TRIDOM Interzone Congo area (ETIC)</p>	<p>This project supports anti-poaching surveillance, monitoring animal populations and threats to PAs in northern Congo and provides an opportunity for sharing information and experiences with the EarthRanger Project.</p>

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SSC, CBIT and co-financing

New and emerging technologies that combine to improve real-time situational awareness have been piloted in several protected areas across Africa and beyond. Key technologies that have emerged include AI2?s EarthRanger software platform that aggregates information from the field in real-time. Aligned with EarthRanger is the deployment of (a) digital radio systems to improve voice communications and enable real-time tracking of personnel and other assets such as vehicles, (b) LoRa WAN systems to provide connectivity over remote protected areas, and (c) numerous other sensor technologies that are applied and deployed on a fit-for-purpose basis. Examples of protected areas where such technologies have been deployed include:

- ? Lewa Downs Reserve, Kenya
- ? Niassa National Park, Mozambique
- ? Ennedi, Chad
- ? Gorongosa National Park, Mozambique
- ? 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
- ? Lower Zambezi National Park, Zambia

All of the above protected areas attest to the positive impact of that EarthRanger deployment has had on achieving management effectiveness through improved real-time data collection, surveillance and situational awareness.

The technology currently used for data gathering and surveillance in the management of protected areas in Africa which the EarthRanger will complement are described below.

●**Satellite and LoRa tracking-enabled Animal Collars:** Several makes of animal collars enable the real-time monitoring of animals via satellite or LoRa links into EarthRanger. By monitoring the movement of these animals, they can be protected from human threats, and villages can be warned of impending crop raids. Furthermore, animal behaviour can be undertaken.

●**Digital Radios with satellite tracking capabilities:** Several makes of digital radios enable the real-time monitoring of patrols via satellite or LoRa links into EarthRanger. Besides the 2-way communications between patrols and headquarters, knowing where patrols are in real-time enables PA Management to manage and protect them.

●**EarthRanger Track, Android app for personnel tracking:** AI2 has developed an Android tracking app that links into EarthRanger. Knowing where patrols are in real-time enables PA Management to manage and protect them.

●**Vehicle Trackers (terrestrial and airborne):** Several makes of vehicle trackers enable the real-time monitoring of those vehicles in EarthRanger. Knowing where the personnel on vehicles are in real-time enables PA Management to manage and protect them.

●**Personnel Trackers:** Several makes of personnel enable the real-time monitoring of field staff via satellite links into EarthRanger. Besides the 2-way communications between patrols and headquarters, knowing where patrols are in real-time enables PA Management to manage and protect them.

●**CyberTracker:** CyberTracker enables PA field staff to capture any type of field observation, which then populate EarthRanger in real-time. Observation categories include Security, Ecological Monitoring, HWC and Logistics.

●**Open Data Kit** (Mongabay, 2020) enables protected areas managers to work off grid and users can transfer field data from a mobile device to a server which is uploaded to Excel, Google Maps, or more sophisticated statistical analysis software. The Kit uses a set of free and open-source survey tools, can integrate GPS locations, photos, videos and audio files into customized forms, while working off-the-grid.

●**Camera traps:** These are remote cameras that take photos when a sensor is triggered by the movement of an animal or person and send the image in real-time to the operator. They have helped researchers to document the presence of elusive wildlife. The cameras have also helped to study species behavior in the dark. More sophisticated camera traps can distinguish between different species, including humans, so that relevant images can be sent to EarthRanger in real-time for further action by PA Managers.

? **LoRa Communications Network:** This is a low-bandwidth technology emerging from the Internet of Things innovations. This technology improves monitoring of variables that help to reduce conflicts between people and wildlife. The LoRa WAN network technology is connected to several sensors placed in the field, creates a network of communication tools to alert people when elephants are approaching or when electric fences are not working. Thus, the technology helps to save lives of both people and wildlife.

? **Remote satellite sensing systems:** Satellite sensors that feed-back information such as fires and deforestation events can be linked to EarthRanger in real-time.

? **Fence breakage alerts:** Sensors on PA fences are able to sense when an electric fence is tampered with, alerting PA Managers via EarthRanger, so that they can be dealt with appropriately.

Protected area management activities in the participating countries are funded by national budgets, development partners and some regional initiatives. Funds from bilateral and multilateral sources include the Global Environment Facility (GEF), World Bank and the African Development Bank among others. The interventions supported by such funds build on the past work aimed at addressing the gaps such as incomprehensive national mechanisms for ensuring sustainable management of protected areas.

In spite of the baseline interventions, management of the protected areas is still inadequate to ensure sustainability of wildlife and protected areas conservation. This shortfall is partly attributed to the inadequate institutional and human resource capacity in the project participating countries to effectively manage protected areas. There are projects funded under the GEF in the participating countries that focus on strengthening capacity for improved protected areas management. For instance, GEF funding has supported biodiversity conservation, climate change mitigation, sustainable land management and reduction of persistent organic pollutants (chemicals) in the environment. Under the GEF alternative, the EarthRanger project will build on the achievements of projects and initiatives documented in the baseline survey by implementing activities that will help to build human and institutional capacities for effective management of protected areas in the project participating countries.

Furthermore, previous programmes invested in building the foundation for improved protected areas management. The EarthRanger project will build on the achievements of the initiatives to enhance data collection, analyses and sharing for better protected area management. The EarthRanger project interventions will ensure that the protected areas managers in Botswana, Mozambique and Republic of Congo are better equipped and able to cost-effectively manage wildlife and their habitats.

The proposed activities in this EarthRanger deployment project will complement existing protected areas management approaches and strengthen partnerships for efficient ecological monitoring and response to threats. The activities include, but not limited to:

- (i) Multiple, dynamic and rapid responses to wildlife crime.
- (ii) Effective collaboration among protected area managers nationally and internationally.
- (iii) Supporting countries to build robust technological systems and institutional frameworks to share information for effective protected area management.
- (iv) Informing policy and strategic planning processes particularly where ecological monitoring may necessitate adjustments in PA management approaches.
- (v) Undertaking capacity building activities that are flexible and country-driven aimed at ensuring that interventions and activities directly add value while strengthening protected area management.

This project will leverage additional benefits for protected area management at the national and regional levels including:

- (i) Putting in place a professional group of competent protected area managers to support ecological monitoring and sustainable conservation of protected areas.
- (ii) Establishment of functional inter-country cooperation and coordination for enhanced protected area management.
- (iii) Transparent communication of responses to wildlife crime and threats to flagship species of conservation priority.
- (iv) Identification of multiple impacts of threats on conservation areas that can jeopardize biodiversity conservation.
- (v) Enhancing national institutional capacity for biodiversity conservation and protected area management.
- (vi) Enhancing the multitude of social, cultural, economic, and environmental benefits.

National reporting of protected area management will have clear and immediate applications, such as species-specific conservation interventions. In addition, the successful implementation of the EarthRanger project will attract international support for proposed actions or plans for protected area

management. The increased availability of information from the retrievable databases as a result of access to real-time ecological and management information will be beneficial to the regional and global community. The information package consisting of lessons learned and best practices will be shared to aid planning, implementation, and funding of protected area management activities.

In all project interventions, the protected area managers in the participating countries will be able to access and share knowledge generated, lessons learnt, and best practices through established networks and platforms that will also facilitate mentorship, peer-to-peer exchange, and professional development.

In terms of scalability, this project will demonstrate the considerable value-added by the EarthRanger technology for improved protected area management effectiveness. This is expected to promote and advance the uptake of such technologies by the public sector agencies. Deployment of the EarthRanger technology will indeed entail capital costs that are unavoidable for each protected area. However, the costs will vary with the state of existing technologies and infrastructure. With regard to the best way of spending a limited budget, it is anticipated that this project will convince decision-makers to invest in tested, robust and fit-for-purpose technology that will deliver beyond the expected outcomes.

#### 6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

Protected areas remain the cornerstone for conservation and the primary strategy implemented to halt the decline in biodiversity. Protected areas contribute to biodiversity conservation by removing extraction pressures from an area and by supporting the management of threats within and around protected areas. They are places where conscious efforts are made to preserve wild species and the ecosystems in which the species live. It is widely agreed that in parts of the world, Africa inclusive, most of the landscape has already been transformed by agriculture or industry and protected areas are the only natural or near-natural ecosystems remaining. Conservation of biodiversity?of species, genetic diversity within species, and of habitats and ecosystems?underpins ecosystem function and has many practical, utilitarian benefits. Research provides strong evidence that management of protected areas is one of the most effective means for slowing down the rate of biodiversity loss and many species continue to survive because of effective management interventions.

Improved management effectiveness of the target protected areas will make them resilient to the growing threats to biodiversity and ecosystems. The strengthened resilience will conserve biodiversity and sustain ecosystem functioning and provisioning. In addition, the EarthRanger project will contribute to 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 biodiversity loss).

Through EarthRanger technology, management of at least 4,901,650 hectares of protected areas in the project participating countries will have improved METT scores as illegal harvesting and trafficking of threatened species, poaching, and destruction of habitats through human encroachment are mitigated thus resulting in biodiversity conservation. In addition, loss and degradation of forest ecosystems and water bodies within the target protected areas will be prevented resulting in increased carbon sequestration and hence climate change mitigation. In many respects, the project will help to conserve globally significant biodiversity as well as aquatic and terrestrial ecosystems that lie within the target protected areas thereby securing ecosystem goods and services that contribute to the achievement of sustainable development and green growth.

In the past three years, the deployment of modern technology to improve protected area management effectiveness in Africa has been tested in ecosystems that are nationally or privately managed. Availability of resources and funding opportunities exposed the protected area managers to risks of

expenditures on new and untested technologies. On a classic bell curve of new technology uptake, the ecosystems have represented the risk-taking 'innovators'. The trajectory along this curve has now reached the point of 'early adoption' (which is the stage when the risk of failure is low but the vision to see the potential remains high although the technology is not yet embraced by the majority of users). This scenario is especially true for new technology adoption by public sector entities and local community end users.

In terms of sustainability, there are technical and financial dimensions. In the former, the EarthRanger software is a bespoke solution that has been engineered specifically for the conservation sector. Therefore, it is robust, user-friendly, and able to absorb multiple data inputs as new sensor and tracking technologies emerge. In this regard, 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 network/software 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 apart from routine maintenance and upkeep. EarthRanger is free for all conservation organizations, including the development, maintenance, and support of the software. The hardware is provided by commercial organizations that will expect compensation for any servicing and support.

### **The link between protected areas and the Aichi Targets**

Analyses of the broad impact of the project on biodiversity conservation indicate that protected areas have been successful in reducing habitat loss (Aichi Biodiversity Target 5), have had a positive impact on a number of species, have lowered the risk of species extinction as a result of protecting the critical sites and habitats (Aichi Target 12) (UNEP-WCMC and IUCN, 2016). Furthermore, 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 resources by the government of participating countries and leveraging of financing opportunities through major developments (UNEP-WCMC and IUCN, 2016).

**Table 7** elaborates the link between the EarthRanger project and the global environmental benefits (GEBs) outlining how the project will contribute to the GEBs against the current baseline conditions.

**Table 7: Link between the EarthRanger project and Global Environmental Benefits (GEBs)**

GEBs per GEF focal area	Baseline Scenario	How the Earth Ranger project will contribute to the GEBs/ Project alternative (with the GEF funds)
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GEBs per GEF focal area	Baseline Scenario	How the Earth Ranger project will contribute to the GEBs/ Project alternative (with the GEF funds)
<p><b>Biodiversity</b> Global environmental benefits include:</p> <ul style="list-style-type: none"> <li>? Conservation of globally significant biodiversity.</li> <li>? Sustainable use of the components of globally significant biodiversity; and</li> <li>? Fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources.</li> </ul>	<p>There is on-going loss of biodiversity through habitat destruction and unsustainable exploitation of PA resources.</p>	<ul style="list-style-type: none"> <li>? 4,901,650 Ha of PAs safeguarded through effective management resulting in 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)</li> <li>? Protection and conservation of globally significant biodiversity and threatened species within the PAs (mainly Elephants, Rhinos, Leopards, as well as endangered flora spp.)</li> <li>? Protection and conservation of forests and water bodies within the PAs hence increase carbon sinks which mitigate GHG emissions</li> <li>? Enhance community participation for effective management</li> </ul>
<p><b>Land Degradation</b> Global environmental benefits resulting from GEF's focus on this focal area include:</p> <ul style="list-style-type: none"> <li>? Improved provision of agro-ecosystem and forest ecosystem goods and services.</li> <li>? Mitigated/avoided greenhouse gas emissions and increased carbon sequestration in production landscapes, and</li> <li>? Conservation and sustainable use of biodiversity in productive landscapes.</li> </ul>	<p>PA management capacity is still low to ensure sustainable management of biological resources</p>	<p>Strengthened protected areas management capacity will progressively enable the participating countries to sustainably manage biological resources. This effort will lead to better-informed strategies, policies, and plans at national and regional levels for sustainable land management.</p> <p>The EarthRanger project will contribute to the GEBs of reduced GHG emissions and increased carbon sequestration through improved capacity of land managers to effectively manage the landscapes.</p>
<p><b>Sustainable Forest Management/REDD+</b> Global environmental benefits resulting from GEF's focus on this area include:</p> <ul style="list-style-type: none"> <li>? Reduction in degradation and deforestation.</li> <li>? Maintenance of the range of environmental services and products derived from forests; and</li> <li>? Enhanced sustainable livelihoods for local communities and forest-dependent peoples.</li> </ul>	<p>Inadequate capacity for effective protection of the PAs ? low capacity to monitor ecological and PA management activities.</p>	<p>Forest within the 6 target PAs will be protected and conserved. This project will strengthen national capacity to monitor ecological and protected area management activities</p> <p>The EarthRanger project provides a profound basis for comprehensive data collection, processing and reporting as a prerequisite for making informed decisions on sustainable natural resources management.</p>

<b>GEBs per GEF focal area</b>	<b>Baseline Scenario</b>	<b>How the Earth Ranger project will contribute to the GEBs/ Project alternative (with the GEF funds)</b>
? Enhanced capacity for ecological and management monitoring and quick response to wildlife crime and related misdemeanors.	Inadequate technical, financial, and human resources for effective management of protected areas	The project will enhance the capacity of institutions in the project participating countries to gather, analyze, store and disseminate information for timely decision making and quick response to wildlife crime and related misdemeanors.
? Enhanced control of wildlife crime and related transgressions.	Inadequate response mechanisms to wildlife crime and related transgressions.	The project will enhance information collection, processing, and use for sound planning and timely decision-making in protected area management.
? Increased awareness and more efficient sharing of high-quality data (collected, processed, and packaged) through peer learning.	Insufficient knowledge, awareness, and access to conservation technologies that support effective management of protected areas	Capacity building undertaken to enhance protected area management effectiveness.
? Preparation, review, and effective implementation of wildlife and protected area policy in the participating countries.	Inadequate information and weak policy implementation that safeguards wildlife and conserves the protected ecosystems	The project will facilitate the generation of information and enhance access to the information to strengthen decision-making and protected area management policy implementation in each project participating country.
? The agencies responsible for wildlife and protected area management in the project participating countries will learn and benefit from each other's knowledge, skills, experiences, and best practices.	Weak coordination between authorities in charge of protected area management.	Institutional coordination is enhanced and strengthened at national and protected area management levels.

In terms of GEF Core Indicators, this project will contribute to core indicators 1 (*number of hectares under improved management for conservation and sustainable use*) and 11 (*number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment*). The total size of protected areas with improved management will be 4,901,650 ha and the total number of direct beneficiaries will be 162 consisting of 138 men and 24 women (**Table 8**).

**Table 8: Status of Project Core Indicators**

<b>Project Core Indicators</b>		<b>PIF Submission</b>	<b>CEO Endorsement Submission</b>
1	<i>Terrestrial protected areas created or under improved management for conservation and sustainable use (Million Hectares)</i>	2,115,200	4,901,650
2	<i>Marine protected areas created or under improved management for conservation and sustainable use (Million Hectares)</i>		
3	<i>Area of land restored (Million Hectares)</i>		

4	Area of landscapes under improved practices (excluding protected areas) (Million Hectares)		
5	Area of marine habitat under improved practices (excluding protected areas) (Million Hectares)		
	Total area under improved management (Million Hectares)	2,115,200	4,901,650
6	Greenhouse Gas Emissions Mitigated (million metric tons of CO <sub>2</sub> e)		
7	Number of shared water ecosystems (fresh or marine) under new or improved cooperative management		
8	Globally over-exploited marine fisheries moved to more sustainable levels (thousand metric tons) (Percent of fisheries, by volume)		
9	Reduction, disposal/destruction, phase out, elimination, and avoidance of chemicals of global concern and their waste in the environment and processes, materials, and products (thousand metric tons of toxic chemicals reduced)		
10	Reduction, avoidance of emissions of POPs to air from point and non-point sources (grams of toxic equivalent gTEQ)		
11	Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment	<b>Total beneficiaries:</b> Nil	<b>Total beneficiaries:162</b> (Men: 138; women:24)

### **The target Protected areas and the selection criteria**

The number of Hectares of terrestrial protected areas that will be under improved management for conservation and sustainable use has increased from 2.1 Ha to 4.9 Ha. This is because the target protected areas have been confirmed.

The target protected areas for the deployment of EarthRanger technologies through this Project were selected through stakeholder consultative processes at the national level, involving the key decision-makers like the relevant Government ministries, departments, and agencies in Botswana, Mozambique, and The Republic of Congo. In addition, AI2 (a private sector institution) and CSOs working with the respective governments to manage protected areas at the country level were also consulted. These CSOs are Peace Parks Foundation for Zinave and Limpopo in Mozambique as well as African Parks, No? and Wildlife Conservation Society in the Republic Congo.

The target protected areas were agreed upon with each of the participating countries and are listed in **Table 9**

**Table 9: Protected areas selected for deployment of the EarthRanger technology in each target country**

Country	Name of Target Protected Area	Category	Area (ha)	WDPA ID	IUCN CATEGORY
Botswana	1. Chobe	NP	1,100,000	600	IB: Wilderness Area
Mozambique	1. Zinave	National Park	412,100	9035	II: National Park

	2. Limpopo	National Park	1,115,000	20295	II: National Park
The Republic of Congo	1. Nouabal?-Ndoki	NP	415,000	72332	II: National Park
	2. Odzala-Kokoua	NP	1,354,600	643	II: National Park
	3. Conkouati-Douli	Ramsar site	504,950	109018	Not reported
		<b>Total</b>	<b>4,901,650</b>		

The criterion for selecting the PAS is provided below:

- a. **Challenges and threats to biodiversity** ? including the type of threat (e.g., poaching, human-wildlife conflict, etc.), the species affected, the severity, frequency, and time of the year the threat takes place. It also considered the weapon (e.g., guns or snares) and the vehicles (e.g., on foot, 4-wheel cars, lorries) used by the perpetrators.
- b. **The willingness of stakeholders to embrace the technology at the site** ? discussions were held with key stakeholders for each of the sites to obtain consensus.
- c. **Availability of supportive infrastructure** ? infrastructure such as control rooms and road networks are important for the installation of protected area management technologies. The cost of building and maintaining such infrastructure is minimized where these exist already.
- d. **Access to electricity** ? the functioning of the installations requires electricity.
- e. **Staff capacity** ? including personnel and logistics for patrols, ecological monitoring, wildlife survey, safety and health, general security, and human-wildlife conflict monitoring, among others. These activities can be overwhelming where staff capacities are limited.
- f. **Co-financing opportunities** - the existence of partners from whom additional resources can be mobilized to leverage project implementation.
- g. **Sustainability** - where there is high likelihood of successful uptake over the long term. In the selected PAs, the executing partners already have long-term partnership MoUs with the respective governments and investments such as salaries of control operators that will continue to be paid after GEF project funding ends. Additionally, the non-state executing partners will continue utilizing and servicing the technology after this project ends since this project's interventions are embedded in the government's PA systems and their long-term institutional activities that that they are undertaking in the target PAs.

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#### **Biodiversity (BD) Tracking Tool for Protected Area Projects (METT)**

METT scores were calculated through virtual discussions with stakeholders for all the selected sites during the PPG phase to provide baseline estimates. Covid-19 travel restrictions impeded in-depth consultations at Protected Areas level. Therefore, further assessments will be undertaken during the project implementation phase as part of the project setup activities.

#### **The target number of beneficiaries and the selection criteria**

The number of direct beneficiaries was estimated based on the number of existing government personnel (including rangers) at the target sites. This comprises 30 trainees at a managerial level from the relevant ministries, agencies, and departments that are responsible for protected area management at the national level and 120 that are at the field staff level.

Based on the estimated number of direct beneficiaries, 15% are women and 85% are men. This is because of the existing gender proportions among the rangers at the parks. Generally, there are few women rangers in the parks however, the project will put measures to involve more women. The measures are provided in the Gender Mainstreaming Plan.

The breakdown of the direct beneficiaries per outcome is provided in **Table 10**.

**Table 10: The breakdown of direct beneficiaries**

OUTCOME	END OF PROJECT TARGET	MEN	WOMEN	TOTAL (DIRECT BENEFICIARIES)
<b>Outcome 1.1:</b> Strengthened institutional and technical capacity of participating countries to effectively manage protected areas.	<b>Target 1.1.6.1:</b> At least 42 Protected Area management staff trained to utilize EarthRanger software ( <b>Men = 36; Female = 6</b> ) (4 management staff and 3 control room staff per PA)  - 24 management staff for the 3 countries); and  - 18 control room staff for the 6 selected PAs a total of  ( <b>Total is 42</b> ).	36	6	<b>42</b>
	<b>Target 1.1.6.2:</b> At least 120 field staff with reliable voice communications and real-time SOS capability (At-least 20 in each PA per country) and they are thus 120 for the six selected PAs. ( <b>Total is 120</b> ).	102	18	<b>120</b>
<b>TOTAL</b>		<b>138</b>	<b>24</b>	<b>162</b>

## 7) Innovativeness, sustainability, and potential for scaling up

### **Innovativeness**

EarthRanger is an innovative tool that will be deployed in the target national parks. Over the past three years, the deployment of technology to improve protected area management effectiveness in Africa has been tested in various wildlife reserves that are privately managed. Access to greater and flexible funding has made it possible for the managers of the wildlife reserves to innovate and incur the risks of expenditures on new and untested technical solutions. On a classic bell curve of uptake of new technologies, these wildlife reserves represent the risk-taking ?Innovators?. Trajectory along this curve is now at the point of ?Early Adoption? (which is the point when the risk of failure is low, the potential of the technology remains extremely high but not yet embraced by the majority of users) which mirrors

the adoption of the EarthRanger technology in the early years of the project as it is deployed for improved protected areas management effectiveness.

In conjunction with the introduced Earth Ranger technology and supporting tools, emphasis will be placed on creating and demonstrating the value of conservation technology in protected area management and biodiversity conservation and how the data from the conservation technology (in this case Earth Ranger) can inform decision-making and policy formulation.

The AI2 ER regional platform and the AI2's Annual ER conferences are an input for sustainability and innovation. The use of the EarthRanger technology in promoting management effectiveness of protected areas is progressively taking root on the African continent and is already being implemented in countries such as Kenya, Rwanda, Tanzania, and Malawi among others. AI2 holds regular conferences to share experiences on the use of EarthRanger technologies in protected area management. PA management staff have opportunity to attend the conferences for information and knowledge exchange to enhance capacity in the use of the technology. AI2 will also be available to provide technical support to the protected area managers as needed.

### **Sustainability**

The sustainability of a project is an integrated process involving social, economic, cultural, legal, political, health, environmental and financial measures among others that facilitate continuity. In this EarthRanger project, sustainability refers to the ability of the protected areas in the project participating countries to continue to use the EarthRanger technology after the project has ceased and how the project impact will outlive the direct involvement of AI2 in the project.

The dimensions of sustainability considered in this EarthRanger project are:

- a) Institutional stability ? the ability of the PA management agencies of Government and the associated executing partners in the project participating countries to oversee and manage the protected areas. Institutional sustainability will be ensured because:
  - ? -The Earth Ranger software will be incorporated in the existing government PA management structure and systems in the target countries.
  - ? -The executing partners who will deploy the technology in the protected areas already have ongoing relationships with commitment through MoUs with the respective governments to manage the protected areas. The partners will play an integral role in ensuring that the EarthRanger (ER) technology is utilized after the project ends since the ER technology is also embedded in their systems and activities that they are executing in these protected areas.
- b) Continued operation and maintenance of project facilities ? this is aimed at long-term use of the EarthRanger and related technologies. Maintenance and service to ensure that EarthRanger software and associated accessories function effectively will be undertaken by the respective countries. This will ensure sustainability. Initial service support will be provided by AI2 as part of capacity building.
- c) The continuous flow of net benefits ? the protected areas will continue to benefit from the timely real-time data capture, processing, and application in planning and decision making.
- d) Equitable sharing and distribution of project benefits ? the benefits of enhanced protected areas management such as reduced wildlife crime, stable wildlife populations, sustainable wildlife-based tourism, and associated revenues will have a ripple effect on the national and local area economies.
- e) Continued community participation ? the local communities living adjacent to the target protected areas are key stakeholders in ensuring the success of the EarthRanger technology for improved protected area management.

The Project Sustainability Management (PSM) approach has been considered in this EarthRanger project. It refers to a mix of systems, structures, plans, resources, laws, regulations, technologies, and other mechanisms that should be put in place for effective and efficient management of the PAs. The project sustainability management process customizes sustainable development goals and is aligned to

national development frameworks, local conditions, and development priorities of the project participating countries. It is anticipated that the project implementing partners will establish an ethical framework as the basis for enforcing codes of conduct and maintaining dialogue among themselves and with stakeholders while accounting for the results achieved by the EarthRanger project in the project participating countries. Maintenance and service to ensure that EarthRanger software and associated accessories function effectively will be undertaken by the respective countries under each of the country's budget frameworks. This will ensure sustainability. Initial service support will be provided by AI2 as part of capacity building.

After the initial set-up costs that this project will undertake, the ongoing running cost of the software is minimal. The primary ongoing costs are staffing and personnel costs. We have intentionally designed the project so that all personnel costs are covered by field partners. In this way, we prepare partners to budget for the ongoing annual personnel costs even after the project ends. Notably, 5 out of the 6 selected Protected Areas have well-established public-private partnerships in place with the Government which we view favorably in terms of long-term sustainability. In addition, these project activities are embedded on existing structures jointly run and managed by the Government and selected partners hence it is anticipated that operationalization and management of the technology will be continued by government authorities with support from the partners and AI2 advisory support.

### **Replicability and Potential for Scaling Up**

The robustness of the EarthRanger technology is acknowledged in this project and its successful application and generation of consistent data will be the hallmark of replicability of the information to aid decision-making for effective protected area management. In the science and technology realm that includes the EarthRanger technology, replicability refers to obtaining consistent results that answer the same scientific question, each of which has obtained its own data.

This project will demonstrate the considerable value-addition of the EarthRanger technology in sound decision-making for improved PA management. The successful implementation will promote and advance the uptake of the EarthRanger and related technologies. The deployment of EarthRanger technology will entail capital costs in each protected area and the level of investments will depend on the state of existing technologies and infrastructure. However, this project will demonstrate that the EarthRanger technology is a tested and robust fit-for-purpose innovation that can deliver a satisfactory return.

There is potential for scaling up deployment of EarthRanger and associated conservation technologies for PA management effectiveness. This project, through Component 2, seeks to increase uptake and enhance awareness about the benefits of utilizing the Earth Ranger technology in protected areas management. It is also anticipated that through the dissemination of Earth Ranger's success stories, other African countries will develop interest to install and use EarthRanger and related conservation technologies to manage their protected areas.

Strategy for replicability of the EarthRanger project includes:

- a. **Strengthening of institutional framework:** successful implementation of the EarthRanger project will require effective and efficient organizational structure in the project and supportive administrative structures in the project participating countries.
- b. **Capacity building:** this will be required on two fronts (1) strengthening coordination and implementation capacity of partner institutions in the project and (2) development of human resources competence at different levels through training to enhance knowledge and skills. Capacity building of existing institutions in the selected protected areas will enhance the delivery of project outputs and outcomes.
- c. **Management Information System:** a functional database is a cornerstone of the EarthRanger project. A good management information system will augment the

capabilities of the project implementing partners. This project will support the development of a system of data management that is simple and accessible.

d. **Preparation of Needs-Based Action Plan:** to develop action plans, it is important to assess the existing technological capacity in the target protected areas. Knowledge of the existing technologies and their shortfalls will help to prepare robust action plans. The assessments will also help to identify appropriate technologies and approaches for effective protected area management.

e. **Preparation of investment plan:** studies will be commissioned to examine various alternatives with protected area managers to address technological needs and services for enhanced protected area management. Resource mobilization from internal and external sources will be explored. This process will lead to a clear understanding of the costs and benefits of investments in technologies for effective protected area management. The bottom-up approach will provide a basis for making realistic investment choices at the PA and national levels.

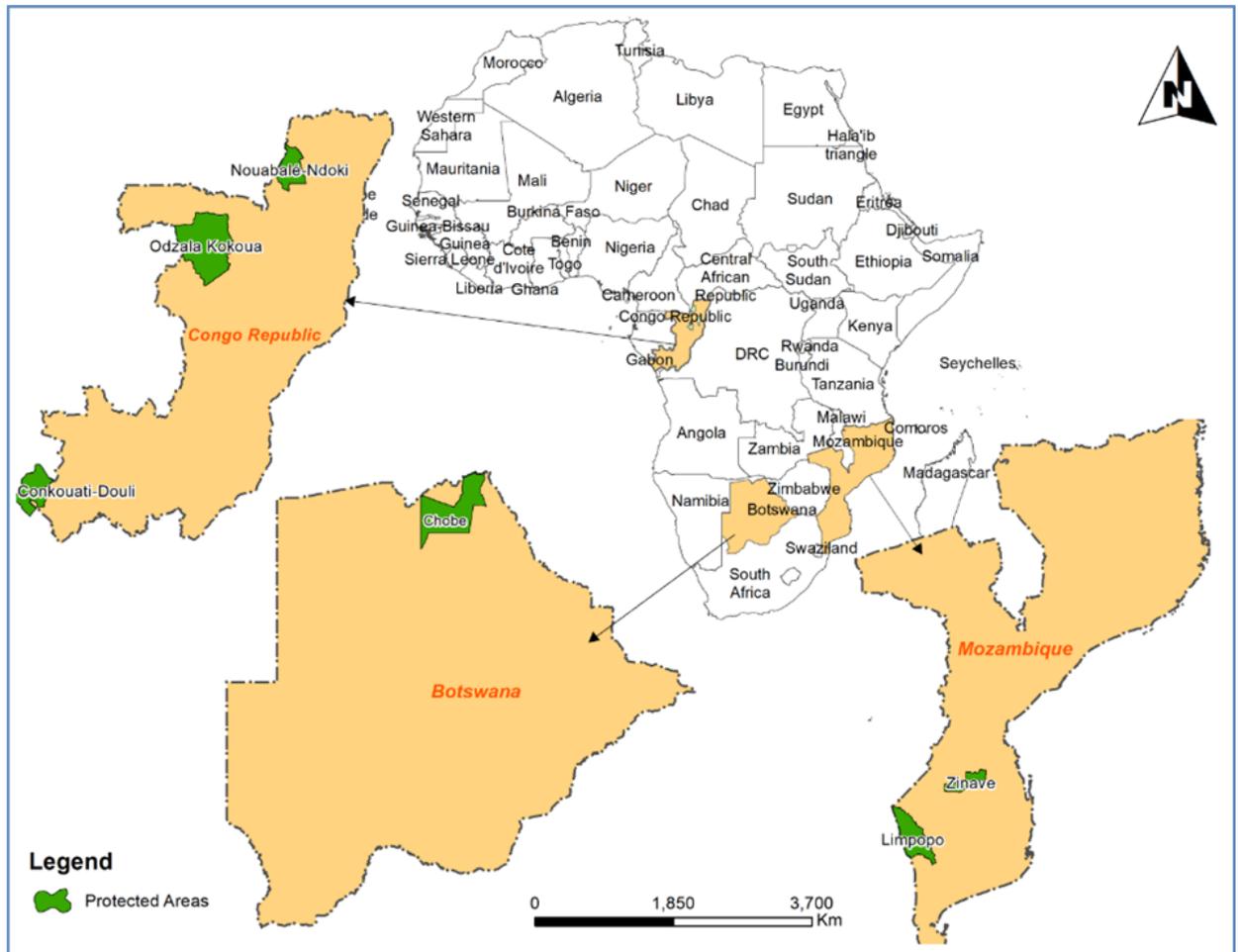
f. **Adoption of best practices:** best practices from the project selected protected areas will be documented and shared via appropriate channels and platforms with other protected area managers in the project participating countries and beyond. Innovative policy development, legal and regulatory framework, project implementation, institutional development and financing mechanisms will be examined for replication in other African countries.

g. **Scaling up and promoting ER deployment to other PAs:** The project seeks to deploy the ER technology to other PAs ? either within the 3 project countries or new countries. This project targets to enhance awareness about the benefits of utilizing the Earth Ranger technology in protected areas management. Through the dissemination of Earth Ranger?s success stories, other African countries may develop interest to install and use EarthRanger and related conservation technologies.

#### 1b. Project Map and Coordinates

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

**Figure 2: Map of Africa showing locations of Botswana, Mozambique, and Republic of Congo and the selected protected areas**



## Botswana

**Chobe National Park** (18° 40' 00" S, 24° 30' 00" E) - was gazetted in 1968 (GN No.4 of 1968) and is located on the banks of a perennial watercourse, the Chobe River, which is also a transboundary resource between Botswana, Namibia, Zambia, and Zimbabwe. From Botswana, the Chobe River converts into the Zambezi River to feed into Victoria Falls. It encompasses floodplains, swamps, and woodland in the Northern part of Botswana within the Chobe District. It is the second-largest National Park (NP) in the country and has more than 75 mammal and 450 bird species. The Department of Wildlife and National Parks (DWNP) in the Ministry of Environment, Natural Resource Conservation and Tourism is responsible for the management of the Park, in collaboration with the local Community-Based Organizations (CBOs)(Community Trust CBOs) formed at villages adjacent to the NP, under community-based natural resource management (CBNRM) arrangement. Each CBOs is governed by a Board of Trustees (BoTs), which are the legal entities to transact business on behalf of the CBOs. The DWNP leases part of the park to the CBOs, who then enter a partnership with safari tour companies (e.g., Wilderness Safari) for tourism development. The main challenges and threats to biodiversity are poaching and human-wildlife conflicts. The Park is widely known for its large elephant population, estimated to be around 50,000, and other wildlife (e.g., hippos, buffalos, zebras, giraffes, tsessebe, puku, lions, leopards, cheetahs, and wild dogs). It is however noted that elephant numbers vary due to seasonal migrations. Local communities living in the five villages in the Chobe enclave and around the

park are involved in crop cultivation and livestock rearing. Land-use constraints along with the poor performance of agriculture exacerbated by the human-wildlife conflicts that include livestock predation and crop damage by wildlife such as elephants have reduced economic activities. Villagers cannot expand communal grazing lands without encroaching on the protected areas.

## Mozambique

**Zinave National Park** (21°40'43.76"S; 33°32'20.64"E) - was established in 1972 and is an integral part of the Mozambican component of the Great Limpopo Transfrontier Conservation Area that includes Kruger National Park in South Africa. The Park is generally flat and comprises mainly a savannah type of vegetation, with flooded pans in the northeast, a riverine forest, miombo woodlands, and open woodlands. Wildlife includes spotted hyena, wildebeest, sable antelope, hartebeest, reedbuck, cheetah, giraffe, zebra, elephant, buffalo, black rhino, eland, roan antelope, and ostrich. The NP is currently under joint management by ANAC and Peace Parks Foundation (PPF), a Government-Private sector partnership arrangement through a Memorandum of Understanding (MoU). The main challenges and threats to biodiversity include illegal logging/deforestation; poaching and human-wildlife conflicts. The Park was neglected for a long time until 2010 when formal management was strengthened. Most of the large mammals were decimated by illegal hunting. Species that are locally extinct or close to extinct include black rhinoceros, Cape buffalo, cheetah, reedbuck, eland, elephant, giraffe, Lichtenstein's hartebeest, roan antelope, sable antelope, spotted hyena, wildebeest, and Selous' zebra.

**Limpopo National Park** (22° 25' 59.9952" S, 1° 22' 0.0012" E) - is one of Africa's most remarkable wilderness areas. It consists of vast mountainous to flat landscapes, with limited hills along the western border along with the Lebombo Mountain range. It is covered by a mixed forest, with dense Mopani bush and Sandveld; and the Shingwedzi River flows from W -SE through the lower third of Park. It was officially declared a national park in 2001 by the Mozambique government after the country's protracted civil war that decimated nearly 90% of the wildlife population. The Park was the battlefield during the civil war with wildlife providing food and finance for the armies. Twenty-seven thousand people lived in the park and its buffer zones resulting in rampant poaching and landscape degradation. When hostilities ceased in the 1990s, the park came under better management when a deal was struck with South African authorities to pull down the fence separating Limpopo National Park from Kruger National Park in South Africa. Animals were trans-located from Kruger into Limpopo and other wildlife slowly started moving into the neighboring land. An agreement between the governments of Mozambique, South Africa, and Zimbabwe to form a cross-border wilderness area including Kruger National Park, Limpopo National Park, and three conservation areas in Zimbabwe (covering a total area of 35 000 km<sup>2</sup>) has ensured the ecological integrity, future protection, and survival of Limpopo National Park. The NP is currently under joint management by ANAC and Peace Parks Foundation (PPF), a Government-Private sector partnership arrangement through a Memorandum of Understanding (MoU). The main threats to biodiversity include poaching (mainly on foot using snares and gin traps), and human-wildlife conflict.

## The Republic of Congo

**Nouabalé-Ndoki National Park** (2°35'8.48"N; 16°37'44.87"E) - was established in 1993 and is part of the contiguous lowland rainforest in the northern Republic of Congo. The forest is part of the larger Sangha Tri-National Forest Landscape and a stronghold for populations of large mammals including forest elephants, western lowland gorillas, and chimpanzees. There is a range of different land uses across the larger Ndoki landscape that extends outside the national park. These include biodiversity conservation. The Park also contains forest clearings that offer a window into the lives of shy forest wildlife, creating fantastic opportunities for tourism development and conservation science. The management of the NP is the responsibility of the Wildlife and Protected Areas Agency, Ministry of Tourism and Environment, in partnership with Wildlife Conservation Society - Congo, (WCS). The main challenges and threats to biodiversity include poaching of endangered species, industrial logging, and Artisanal and industrial mining. Logging operations often inadvertently facilitate illegal activities such as the commercial exploitation of ivory and bushmeat and constructing a road network that opens up previously inaccessible areas to poachers. The large logging settlements that are constructed to house the logging company employees increase the demand for bushmeat and other wildlife products. In 1999, WCS, the Government of Congo, the timber company CIB (Congolaise Industrielle du Bois), and the local community agreed to collaborate and created the *Projet Gestion des Ecosystemes Adjacents au Parc National Nouabalé-Ndoki* (Project for the Management of Ecosystems Adjacent to the Nouabalé-Ndoki National Park), or PROGEPP to protect endangered species such as elephants and great apes, as well as managing the sustainable hunting of other species such as duikers and wild pigs, which are important as food for the local population. Project staff also advise the logging company on reducing the negative impacts of logging on wildlife through the creation of hunting zones, the provision of alternative sources of protein such as beef and chicken, and the development of community conservation education programs. PROGEPP is a successful example of integrating conservation into logging concessions to the mutual benefit of both wildlife and the local community.

**Odzala-Kokoua** (Longitude 15° 49' 39.5724" latitude - 0° 13.6813') - is one of Africa's oldest national parks, designated in 1935 and received the Biosphere Reserve status in 1977. It covers an area of 1,354,600 ha. The National Park is one of the most biologically diverse and species-rich areas on the planet. In 2010, African Parks entered into a 25-year-long agreement with the Republic of the Congo's Ministry of Forest Economy, Sustainable Development and Environment to protect this globally significant park. Around 12,000 people live in the periphery of the park and survive off the natural resources the area provides. Because of limited opportunities in the region, bush meat poaching remains a major threat, where 14,500 snares and more than 50 tonnes of bush meat were seized in 2019. This is a major concern for the park's wildlife. The management of this protected area focuses on a multi-pronged strategy to protect the park from poaching, including an enhanced eco-guard team and other law enforcement techniques, such as the application of satellite collars to monitor forest elephants and the engagement of communities around the park. In particular, community projects have been implemented to address human-wildlife conflict, sustainable livelihoods opportunities with farming projects, and community capacity-building activities.

**Conkouati-Douli National Park** (03° 54' 17.992 S; 11° 28' 12.002 E) is one of the largest biodiversity reserves in Congo, with very dense flora, typical of equatorial vegetation. Its lush forests

provide a living environment for more than 8,000 chimpanzees and 2,000 western lowland gorillas. The Conkouati-Douli National Park is also home to more than 1,000 forest elephants. These pachyderms coexist with many species of migratory birds that come to squat in the numerous wetlands of the park. The main challenges and threats to the park include logging, mining, oil exploitation, and commercial fishing by Chinese trawlers. The problem of poaching is also common in Conkouati-Douli, where roads bordering and crossing the reserve facilitate the movement of poachers. The inhabitants of the villages adjacent to the park regularly complain about crop-raiding by elephants, and hence causing human-wildlife conflicts. The Ministry of Forest Economy responsible for the management of the protected areas has entered a partnership with No?, an NGO, for the management of the park.

#### **1c. Child Project?**

**If this is a child project under a program, describe how the components contribute to the overall program impact.**

#### **2. Stakeholders**

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

**Civil Society Organizations** Yes

**Indigenous Peoples and Local Communities**

**Private Sector Entities** Yes

**If none of the above, please explain why:**

**Please provide the Stakeholder Engagement Plan or equivalent assessment.**

Stakeholder Engagement Plan provided below.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

To ensure that the project complies with the GEF's Stakeholders' Engagement Policy, the EA (AI2) supported by the PPG consultant developed a **Stakeholder Engagement Plan (SEP)**. The EA will monitor and report on the following minimum stakeholder engagement indicators:

- (i) Number of government agencies, civil society organizations, private sector actors, indigenous peoples and other stakeholder groups that have been involved in the project implementation phase on an annual basis.
- (ii) Number of persons (sex disaggregated) that have been involved in project implementation phase (on a quarterly basis); and
- (iii) Number of engagement activities (e.g., meeting, workshops, consultations) with stakeholders during the project implementation phase (on a quarterly basis)

**Select what role civil society will play in the project:**

**Consulted only;**

**Member of Advisory Body; Contractor;**

**Co-financier;** Yes

**Member of project steering committee or equivalent decision-making body;** Yes

**Executor or co-executor;** Yes

**Other (Please explain)**

### **3. Gender Equality and Women's Empowerment**

**Provide the gender analysis or equivalent socio-economic assesment.**

To ensure that the project complies with the GEF's Gender Policy, a **Gender Mainstreaming Plan (GMP)** was prepared during the PPG process. Sex disaggregated data and gender information will be collected and analyzed to inform gender responsive monitoring and evaluation. The following minimum gender indicators will be monitored and reported on:

- (i) Number of men and women that participated in project activities (e.g., meetings, workshops, consultations).
- (ii) Number of men and women that received benefits (e.g., employment, income generating activities, training, equipment, leadership roles) from the project; as relevant.
- (iii) Number of strategies, plans (e.g., management plans and land use plans) and policies derived from the project that are gender inclusive.

**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** Yes

**Generating socio-economic benefits or services or women**

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

Yes

### **4. Private sector engagement**

**Elaborate on the private sector's engagement in the project, if any.**

The EarthRanger technology was developed by Vulcan Inc in partnership with many conservation partners globally. As of September 2021, the EarthRanger unit was moved to the Allen Institute for Artificial Intelligence (AI2). Both Vulcan Inc. and AI2 are private sector institutions that were founded by the late Paul G. Allen.

AI2 has committed US\$ 2.4 million co-financing to this project. AI2's co-financing letter is provided in Section 7 (part B). This letter describes the nature of the co-financing support that will be provided

by AI2. Notably, AI2 is also the Executing Agency in this project and its roles and responsibilities are captured in Section 5.

The private sector's engagement in the project started at the project conception with AI2 pledging USD 2M co-financing and participating in designing the PIF. AI2 then participated in the PPG processes including undertaking preliminary site assessments to guide site selection, engagement in discussions with PA management agencies during the preliminary site assessments, consultations with potential project execution partners and participation in the preparation of the budget for the required equipment. AI2 also participated in the preparation of the CEO endorsement package.

## **5. Risks to Achieving Project Objectives**

**Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):**

A risk assessment was undertaken during the project preparation process and risks to project implementation were identified and are summarized in **Table 11**. They include the Coronavirus pandemic (COVID-19), security of the EarthRanger System at the PA level, Staff turnover of trained staff, and lack of supportive infrastructure such as electricity at PA level among others. A brief description is provided with respect to the Coronavirus pandemic and **Table 11** provides an overview of the risks and mitigation strategies.

**Safeguards screening (including climate risk screening)** was undertaken by CIGEF during the PPG Phase. There is a potential risk of some of the project's activities to the environment in the Protected Areas as the construction activities might have adverse effects on the environment. The main risks anticipated from the construction activities of the project were identified during the PPG phase to include loss of vegetation cover and destruction of habitats, which would promote loss of biodiversity resources, soil erosion, heat stress due to increase in extreme temperatures and fluctuations, increased frequency and intensity of winds and lightning, and emergence of weather-related diseases. To mitigate these negative impacts, the project will ensure avoidance of areas with heavy vegetation when selecting the construction sites, minimize cutting of the vegetation and undertake restoration interventions for the lost vegetation cover. The detailed findings are described in a Preliminary Environment and Social Impact Assessment (ESIA) and an Environment and Social Management Plan (ESMP). The project will also engage a Safeguards Expert (part-time) to review the environmental and social safeguards and ensure compliance especially during and after the construction and other project activities during project implementation, through monitoring the safeguards indicators.

### **The Corona virus (COVID-19) pandemic:**

The project recognizes that the Corona Virus Pandemic (COVID19) may cause delays and/or slow down the implementation of project activities such as project start-up; delays in project staff recruitment; long periods may elapse before the arrival of procured EarthRanger software and hardware in the project participating countries and low stakeholder participation. Considering that the project will be implemented in protected areas, there is a possible risk that project staff may transmit coronavirus to wild animals (especially primates) during project implementation.

In-order to mitigate the risks outlined above, the project proposes the following mitigation measures: (a) COVID-19 management strategy of this project will be aligned to the Ministry of Health standard operating procedures (SOPs) in each project participating country (b) COVID-19 situational analysis will

be carried out in each project country to inform the preparation and implementation of safeguard plans which indicate activities to address the risks associated with COVID-19 pandemic. (b)The safeguards include the ESMP, Gender Mainstreaming Plan, Accountability and Grievance Mechanism, and a Stakeholder Engagement Plan; (c) the project team will prepare and submit quarterly technical and financial reports to CIGEF. The reports will indicate project implementation progress, any delays, and adaptive measures put in place by project teams. This effort will enable the Agency to guide on the best ways to adapt to the situation on the ground from technical and financial perspectives (d) the project team will develop and implement the project's COVID-19 pandemic Adaptive Management Plan indicating activities to be implemented by project managers (leads) to ensure those project activities are delivered while working remotely; (e) during implementation, the project budget will cover recurrent costs for purchasing hand sanitizers and hand-washing facilities fitted with soap dispensers and personal protective equipment such as face masks, hand gloves and others for project staff use and (f) the project will create a COVID-19 repository and prepare a communication strategy for disseminating information related to the pandemic with project teams and stakeholders. This strategy will entail communicating to stakeholders the impact of COVID-19 on the project and the adaptive measures put in place by the project.

**Table 11: Risk Assessment and Mitigation Plan H**

Risks	Rating (High (H), Substantial (S), Modest (M) Low (L))	Risk mitigation Measures
1. EarthRanger control room and software affected by climate change and variability (heavy rains and/or high atmospheric temperature, high relative humidity) and rodents	High (H)	? Procurement and installation of climate-proof equipment and technology ? Necessary measures will be put in place to prevent rodents e.g., by application of pesticides, disinfection, and regular cleaning of the control rooms among others. ? A room will be designated for relocation and storage of hardware in case the control room is damaged
2. Wildlife crime in the protected areas	High (H)	? Installation of the EarthRanger technology and building capacity of protected area management staff to utilize the technology for monitoring park boundaries, movement patterns of rangers and wildlife, enable rangers to communicate with each other over radio transmitters, enable the staff to submit timely and quality reports thereby ensuring that protected area management planning is based on complete, reliable and real-time data. ? EarthRanger technology is applied to improve the safety of rangers by making sure that their activities are coordinated, and injury caused to each other by crossfire is avoided.

Risks	Rating (High (H), Substantial (S), Modest (M) Low (L))	Risk mitigation Measures
3. Safeguard compliance especially during and after the construction activities. The construction activities might have adverse effects on the environment	High (H)	? A Safeguards specialist will be part of the project to ensure compliance with the safeguard requirements throughout the project life.
4. Lack of security of the EarthRanger hardware in the control rooms	High (H)	? Only designated personnel will have access to the control rooms ? Only designated personnel will have keys to the control room
5. High turn-over of trained staff as an expertise retention risk	High (H)	? Identification of a technology champion in each selected protected area ? The project will undertake a Training of Trainers (ToTs). Facilitators of ToTs to be identified in each PA.
6. Data Management risks	Low (L)	? EarthRanger data are securely stored in the cloud and the project will build on existing systems and enhance them to ensure that data are sent to the central repository.
7. Lack of electricity to power the control room	Modest (M)	? One of the criteria used to identify target protected areas is access to electricity. Backup power supply, such as a generator and solar equipment, will be included in the procurement if it does not exist at a site.
8. Social and Environmental impacts of installing radio and LoRa towers	High (H)	? 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 avoid, minimize and mitigate potential adverse environmental and social impacts
9. Inability to maintain proper functioning of the EarthRanger technology	High (H)	? Training of Trainers will be undertaken in each protected area ? Development and implementation of 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 protected area

Risks	Rating (High (H), Substantial (S), Modest (M) Low (L))	Risk mitigation Measures
<p>10. Coronavirus disease (COVID-19) pandemic which will cause delays and/or slow implementation of project activities including:</p> <ul style="list-style-type: none"> <li>- Delays in the project start-up</li> <li>- Delays to recruit project staff</li> <li>- Long periods elapsing before procurement and delivery of EarthRanger hardware to the project participating countries.</li> <li>- Low stakeholder turn-out and participation in the project.</li> </ul>	<p>High (H)</p>	<p>? The project will prepare the following safeguard plans clearly indicating activities put in place to mitigate risks brought about by COVID-19 pandemic:</p> <ul style="list-style-type: none"> <li>o Labor and Working Conditions</li> <li>o Accountability and Grievance Mechanism</li> <li>o Stakeholder Engagement Plan</li> </ul> <p>? Quarterly technical and financial reports submitted to CI-GEF Agency clearly indicating project implementation progress, any delays and adaptive measures put in place by project teams. This measure will enable the Agency to guide on the best ways to adapt to the situation on the ground from technical and financial perspectives.</p> <p>? The project team will develop and implement the project's Adaptive Management Plan to the COVID-19 situation. The plan will specify activities to be implemented by project managers (leads) to ensure delivery of selected project activities while working remotely.</p> <p>? During implementation, the project budget will cover procurement and recurrent costs of PPE and utilities such as automatic dispenser of hand washing soap and water, hand sanitizers, face masks, hand gloves among others, for project staff.</p> <p>? Creation of a COVID-19 repository and preparing a communication strategy for disseminating information on the pandemic among project teams and stakeholders. This strategy will also entail communicating to stakeholders the impact of COVID-19 on the project and the adaptive and mitigation measures required.</p>

Risks	Rating (High (H), Substantial (S), Modest (M) Low (L))	Risk mitigation Measures
11. Pre-liminary Due diligence of the Executing partner institutions was conducted by CI during PPG Phase.	High (H)	<p>CI- Afd had granted so some partners/grantees before and had conducted previous due diligence. However, full Financial Risk Assessments (FRA) will be completed before granting to any selected partners. Granting will only be done when partners, including the Government, have met the requirements based on the financial risk assessment. The outputs of this assessment will be:</p> <ol style="list-style-type: none"> <li>a. Partners identified and their respective detailed ToRs defining their roles developed and approved by the GoA.</li> <li>b. Budgets allocated to the Partners in correspondence with their ToRs.</li> <li>c. Financial Risk Assessments (FRA) of partner institutions conducted and applicable mitigation measures put in place.</li> <li>d. Contracts/Agreements signed.</li> </ol>

## 6. Institutional Arrangement and Coordination

**Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.**

**Project Duration:** The project duration is 45 months. It is anticipated that project set-up will take approximately 6 months, the actual implementation will take 36 months, project close-out and handover will take 3 months. The mid-term evaluation will be undertaken after 24 months, and the terminal evaluation will commence after 45 months.

### A. Execution Arrangements and Partners

#### Implementing Agency

Conservation International (CIGEF) is the GEF Implementing Agency of this project. The overall role of the CI-GEF Implementing Agency includes technical and financial project oversight and supervision, assuring compliance of the project with GEF policies and procedures as well as monitoring and evaluation of the project activities. Finally, CI-GEF will make recommendations to optimize project performance and will arbitrate and ensure the resolution of any execution conflicts. Specifically, CI-GEF will undertake the following tasks:

- Facilitate interactions with the GEF
- Provide technical and financial oversight to the Executing Agency (The Allen Institute for Artificial Intelligence) and Conservation International Africa Field Division (The Executing Agency support partner).
- Oversee and monitor implementation of the project including reviewing quarterly technical and financial project reports, undertaking annual project site visits, and monitoring the implementation of and compliance with safeguards.

- Ensure that project management practices (technical, financial, and administration) comply with GEF requirements.
- Monitor the project's implementation and achievement of the project outputs, ensure proper use of GEF funds,
- Review and approve procurement plans, budgets, and work plans.
- Quality assurance including ensuring that audits are undertaken by external auditors
- Oversee preparation of the annual project implementation report (PIR) for submission to GEFSEC.
- Commission Mid-term and Terminal project evaluations.

### **The Executing Agency**

The Allen Institute for Artificial Intelligence (AI2) is the project's Executing Agency supported by Conservation International Africa Field Division (CI AfFD).

The Allen Institute for Artificial Intelligence (AI2) as the Executing Agency will consult The Botswana Department of Wildlife and National Parks, The Mozambique National Sustainable Development Fund (FNDS), The Republic of Congo's Ministry of Tourism and Environment, and other executing partners and give guidance as needed. **The AI2 guidance should be in line with the GEF's and the Implementing Agency's policies and guidelines (CIGEF).** The specific role of AI2 is outlined below:

- a. Lead and guide the Project Management Unit (PMU).
- b. Technical backstopping, Quality Control, and Assurance of output deliverables including leading technical trainings and providing guidance and technical input across components.
- c. Provision of technical input and guidance to grantees, service providers, and Conservation International Africa Field Division during the deployment of EarthRanger.
- d. Support Conservation International Africa Field Division in undertaking the finance and operational tasks such as procurement and grants management in line with the GEF and the Implementing Agency's policies and guidelines. AI2 will review and give guidance on the procurement plans, Terms of reference, and procurement packages prepared by the Conservation International Africa Field Division.
- e. Approve Consultant/Grantee activities
- f. Support Conservation International Africa Field Division in the preparation and dissemination of knowledge management products
- g. Approve monitoring and evaluation reports before the Conservation International Africa Field Division submits to the GEF Agency (CIGEF) e.g.,
  - ? Review and approval of technical and financial periodic reports e.g., annual work plans and budgets, technical and financial progress reports before submission to CIGEF
  - ? Review and approve safeguards monitoring reports before submission CIGEF
  - ? Chair the Project Steering Committee (PSC).

### **Executing Agency support partner**

The Conservation International Africa Field Division (CI AfFD) is the Executing Agency's support partner. CI AfFD will support AI2 to undertake its day-to-day execution functions. The specific role of CI AfFD is outlined below:

- a. Host the Project Management Unit (PMU) including the provision of technical input across components and guidance on operations.
- b. Manage the project's financial resources and carry out other project management functions as guided by The Allen Institute for Artificial Intelligence (AI2).
- c. Carry out full due diligence of executing partners using the CI-GEF Financial Risk Assessment and safeguards screening forms before signing grant agreements.
- d. Support finance and operational tasks such as procurement, grants management, financial audits, build the capacity of the Government, project staff, and co-executing partners on financial management and reporting in order to ensure compliance with the GEF's fiduciary standards.
- e. Management of technical output deliverables
- f. Management and reporting of consultant and grantee activities.
- g. Undertake Monitoring and Evaluation (M&E) of the project and obtain approval from the Allen Institute for Artificial Intelligence (AI2) before submitting the M&E reports to the GEF Agency (CIGEF). This entails:
  - ? Preparation of technical and financial periodic reports e.g., annual work plans and budgets, technical and financial progress reports at a reporting frequency required by the GEF Agency.
  - ? Undertake safeguards monitoring and reporting.
  - ? Organize and coordinate the project steering committee functions.
- h. Preparation of procurement plans and obtain AI2's approval before submitting to CIGEF
- i. Preparation of Terms of reference and procurement packages and obtain AI2's approval before submitting to CIGEF
- j. Maintenance of records of all project-related documentation
- k. Liaise with stakeholders to prepare and disseminate knowledge management products
- l. Contract financial audits of the project
- m. Provide onsite technical support during and after the deployment of EarthRanger in the 6 sites.

*Project Management Unit (PMU):*

A Project Management Unit (PMU) comprising of 3 staff (1 full-time and 2 part-time) will be under the Conservation International Africa Field Division. The PMU will report to CI-AfFD and the Allen Institute for Artificial Intelligence (AI2). A description of the roles and responsibilities of the PMU staff is provided below. ToRs are provided in Appendix X for positions charging to both components and PMC.

- ? **Technical Lead/Wildlife Conservation Technology Expert| Part-time:** Overall leadership of the technical inputs of the project and partner engagement, approvals of reports, and operational approvals.
- ? **Deputy Regional Program Manager |Full time:** responsible for the day-to-day project coordination, M&E, execution of the project activities per the approved work plan and budget, Management and reporting of consultant and grantee activities, support finance and operational tasks such as procurement, grants management, financial audits,

maintenance of records of all project-related documentation and undertake project administrative tasks. At the national level, the project manager will guide and report on the performance of grantees and the implementation of safeguard plans.

? **Grants/Finance Officer | Part-time:** Responsible for the financial and grants management of the project; building capacity of sub-grantees to comply with GEF Minimum Fiduciary Standards, support procurement and coordination management and participate in M&E of the project.

#### Positions supporting the PMU

? **Safeguard Compliance Officer |Part time:** Responsible for ensuring the project complies with the safeguard's requirements. This will entail setting up the safeguard plans; implementation of the safeguards; monitoring and reporting on safeguard indicators. The safeguards compliance officer will be supported by each protected area (PA) focal point at the PA level.

#### Executing Partners

**The role of Government partners** (The Botswana Department of Wildlife and National Parks (DWNP), The Mozambique National Sustainable Development Fund (FNDS), and The Republic of Congo Ministry of Tourism and Environment). Some of the roles to be undertaken by the Government partners include:

- ? Proving overall guidance AI2, CI AfFD, and grantees.
- ? Support the delivery and realization of technical output deliverables
- ? Strengthen public-private partnerships in PA management
- ? Participate in the virtual national Project Steering Committees and virtual EarthRanger Working Group
- ? Identifying key personnel to manage Earth Ranger
- ? Providing enabling conditions for the identified personnel to learn
- ? Developing and leading the development of new technologies to support the conservation efforts of the government,
- ? Help facilitate site visits and support with logistics of site visits
- ? Support safeguards monitoring and reporting
- ? Reporting on project progress including review of the project's progress reports prepared by the PMU

**The role of sub-grantees** e.g., African Parks, No?, Peace Parks, and the Wildlife Conservation Society. These partners have a partnership agreement with the respective governments to manage the selected PAs. The partners will:

- ? Support the delivery and realization of technical output deliverables
- ? Deploy their resources e.g., personnel and equipment to roll out the earth ranger technology
- ? Strengthen public-private partnerships in PA management

- ? Participate in the virtual national Project Steering Committees and virtual EarthRanger Working Group
- ? Help facilitate site visits
- ? Support safeguards monitoring and reporting
- ? Reporting on project progress including review of the project's progress reports prepared by the PMU

**Table 12** outlines this project's Executing partners and Sub-grantees, their roles, and rationale for their Inclusion.

**Table 12: Project Executing partners and Subgrantees Roles and Rationale for their Inclusion**

Country	Protected Area	Grantee/ Subgrantee/ Partner	Specific Role	Rationale
Botswana	Chobe National Park	<b>Executing Partner:</b> The Botswana Department of Wildlife and National Parks (DWNP)	The team from the DWNP will consist of protected area managers in each project site, to provide support to the site-level implementation of work plans and budgets; ensuring the strategic installation of EarthRanger systems and related technologies and monitoring of performance.	The DWNP is the Government institution in Botswana that is responsible for conserving and managing fish and wildlife resources and their habitats in consultation with local, regional and international stakeholders for the benefit of present and future generations
		<b>Sub-grantee:</b> TBD: <i>Together with the DWNP, a project Contractor will be identified during the Inception Phase.</i>	The selected contractor will undertake site assessment, develop a project plan, produce a detailed project budget, and lead the project execution.	TBD: <i>Contractor to be identified during inception the inception</i>

Mozambique	? Limpopo National Park	<b>Executing Partner:</b> The Mozambique National Sustainable Development Fund (FNDS)	FNDS will coordinate protected area managers from the Limpopo and Zinave National Parks to provide support to the site-level implementation of work plans and budgets; ensuring the strategic installation of EarthRanger systems and related technologies and monitoring of performance.	The FNDS is the Government institution in Mozambique whose objective is to promote and finance programs and projects that ensure sustainable, harmonious, and inclusive development, to achieve sustainable development.
	? Zinave National Park			

<p><b>The Republic of Congo</b></p>	<p>All the 3 target protected areas in the Republic of Congo</p>	<p><b>Executing Partner:</b> The Republic of Congo Ministry of Tourism and Environment</p>	<p>The Republic of Congo's Ministry of Tourism and Environment will coordinate protected area managers from the 3 target national Parks to provide support to the site-level implementation of work plans and budgets; ensuring the strategic installation of EarthRanger systems and related technologies and monitoring of performance.</p>	<p>In collaboration with stakeholders, The Republic of Congo's Ministry of Tourism and Environment is mandated to ensure conservation and management of wildlife resources across all protected areas in the Country</p>
	<p>Conkouati-Douli National Park</p>	<p><b>Sub-grantee:</b> No?</p>	<p>No? has an existing partnership with the Republic of Congo to manage the Conkouati-Douli National Park. This project is building on this partnership</p>	<p>No? brings a unique skill set that covers Protected Area management, biodiversity conservation, and community economic development involving civil society and the private sector. No? has been working in the RoC and the selected protected area.</p>
	<p>Nouabal?-Ndoki National Park</p>	<p><b>Sub-grantee:</b> Wildlife Conservation Society (WCS)</p>	<p>WCS and the Republic of Congo are jointly managing the Nouabal?-Ndoki National Park. This project is building on this partnership</p>	<p>WCS is an NGO that has experience managing protected areas in Africa. WCS's goal is to conserve the world's largest wild places in 14 priority regions, home to more than 50% of the world's biodiversity.</p>

Odzala-Kokoua National Park	<b>Sub-grantee:</b> African Parks	African Parks and the Republic of Congo are jointly managing the Odzala-Kokoua National Park. This project is building on this partnership	African Parks is a non-profit conservation organization that takes on direct responsibility for the rehabilitation and long-term management of protected areas in partnership with governments and local communities.
Conkouati-Douli National Park	<b>Sub-grantee:</b> No?	No? has an existing partnership with the Republic of Congo to manage the Conkouati-Douli National Park. This project is building on this partnership	No? brings a unique skill set that covers Protected Area management, biodiversity conservation, and community economic development involving civil society and the private sector. No? has been working in the RoC and the selected protected area.

**The National Project Steering Committees (NPSCs)**

The National Project Steering Committees (NPSCs) will play a key oversight role in guiding the project and ensuring successful execution. The NPSCs will also provide continuous ad-hoc oversight and feedback on project activities, respond to inquiries or requests for approval from the Project Management Unit or Executing Agency.

The NPSC will comprise country-level representatives from the respective governments, AI2, CI AFD, and Executing partners.

The NPSC meetings will be scheduled bi-annually by the PMU and co-chaired by the respective Government and AI2. The PMU will be the rapporteur. Notably, the virtual NPSC meetings will also be held regularly if needed to troubleshoot and discuss updates on project implementation progress.

**Virtual Regional EarthRanger Working Group**

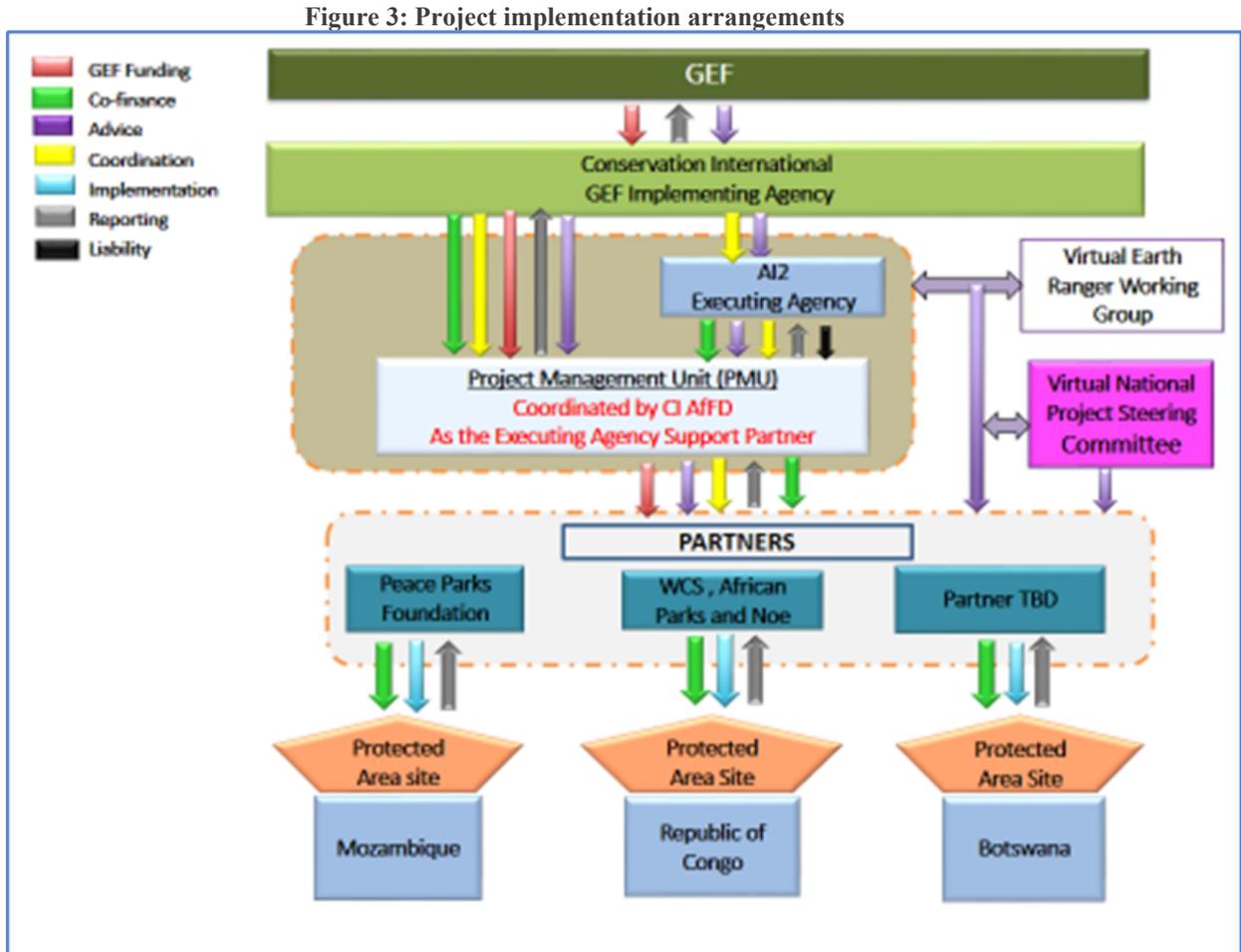
The virtual regional EarthRanger Working Group will provide support in the harmonization of implementation approaches across the 6 protected areas and share lessons/progress updates. The meetings will be held virtually and will be organized by the PMU. There will be an opportunity for a physical meeting during the Annual EarthRanger User Conference.

The virtual regional EarthRanger Working Group will bring all the project stakeholders from the 3 countries (6 protected areas) and comprise representatives from the respective governments, AI2, CI AFD, and Executing partners.

The virtual regional EarthRanger Working Group will be scheduled annually by the PMU and chaired by AI2. The PMU will be responsible for organizing this meeting and act as the rapporteur. The PMU will also prepare and disseminate a knowledge management product following this meeting.

### A. Project Execution Organizational Chart

The Project's Execution Arrangement is summarized in Figure 3



### 7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

In **Table 13** each national priority identified from the national plans and policies of participating countries, presented in the first column, is matched with the corresponding EarthRanger project consistency elaborated in the second column.

**Table 13: Consistency with National Priorities, Plans, and Policies**

National Priorities	Consistency of the project with the national priorities
<b>Botswana</b>	
<p><b>The Constitution of Botswana, 1966</b></p>	<p>The constitution of Botswana provides for ensuring the protection of natural resources and protecting citizens from deprivation of property, which includes ensuring soil conservation and the overall conservation of all-natural resources as well as associated work relating to agricultural development. The project will contribute toward the conservation of natural resources in the country.</p>
<p><b>Botswana Vision 2036:</b>            The purpose of Vision 2036 is to achieve prosperity for all and it is built on four pillars, namely:</p> <p>Pillar 1: Sustainable economic development,            Pillar 2: Human and social development,            Pillar 3: Sustainable environment, and            Pillar 4: Governance, peace, and security.</p> <p>Vision 2036 is also aligned to the global agenda for sustainable development and the principles of the Africa Union's Agenda 2063 to meet global and regional goals.</p>	<p>The EarthRanger project will contribute to the attainment of Botswana's Vision through the following:</p> <ul style="list-style-type: none"> <li>a) Improved management of protected areas will support sustainable economic development (Pillar 1).</li> <li>b) Strengthening human capacities to address the protected area management challenges, and enhance access to technological solutions for tracking wildlife and curtail poaching (Pillar 2);</li> <li>c) Strengthening institutional cooperation and coordination for improved management of the protected areas, reducing human/wildlife conflict, enhancing ecological monitoring, promoting quality of the environment, and achieving sustainable development (Pillars 1 and 3); and</li> <li>d) The project will promote cooperation through peer learning and knowledge sharing for effective protected area management (Pillars 3 and 4).</li> </ul>

National Priorities	Consistency of the project with the national priorities
<p><b>Wildlife Conservation and National Parks Act 1992</b></p> <p>The Act provides a comprehensive framework for wildlife and national parks management under the supervision of the Director of Wildlife and National Parks. Part II designates specific areas as National Parks and gives power to the President to declare any State or bequeathed land as a national park.</p> <p>Botswana has the largest population of elephants in Africa with about 200,000 individuals. To protect this large herd, along with other iconic wildlife species, the government has put in place strong legal measures to protect wildlife against criminal threats such as poaching and trafficking. The Wildlife Conservation and National Parks Act 1992 (Chapter 308:01) provides for conservation and management of Botswana's wildlife, gives effect to CITES and other international conventions for the protection of fauna and flora to which Botswana may from time to time be a party and provides for the establishment, control, as well as management of national parks and game reserves.</p>	<p>The EarthRanger project will contribute to the management effectiveness of the protected areas through improving monitoring, identifying elements of poaching and illegal wildlife trade, and providing a real-time response. The Project is, therefore, consistent with the provisions of the Botswana Wildlife Conservation and National Parks Act.</p>
<p><b>CBNRM Policy approved by parliament in 2014</b></p> <p>The policy provides for the participation of local communities in natural resources management particularly those living adjacent to the PAs. Participation is enabled through issuing of licenses to the communities.</p>	<p>The EarthRanger will contribute to fostering a close working relationship with communities in terms of information sharing and conflict management.</p>
<p><b>National Development Plan 11 (NDP 11):</b></p> <p>Under the Sustainable Environment thematic area, the NDP focuses on developing, reviewing, and implementing relevant environmental legislations, improving coordination and governance of the environment sector, strengthening data requirements and technical capacity within key implementing sectors, developing knowledge and skills for securing sustainable environment and productivity, as well as management and conservation of natural resources. To address these issues, the Government is committed to formulating and implementing conservation policies as well as the biodiversity strategy and action plan.</p> <p>Under sustainable use of natural and cultural resources, the NDP focuses on strengthening the existing and development of new policies and legislation to address threats to wildlife and enhance environmental conservation.</p>	<p>The EarthRanger project will contribute to the attainment of Botswana's NDP 11 aspirations by:</p> <ul style="list-style-type: none"> <li>a) Improving the human resource capacity and enhancing the application of science, technology, and innovations in ecological monitoring and protection of wildlife</li> <li>b) Enhancing wildlife-related information collection, management, and utilization in decision making as protected areas support wildlife-based tourism that contributes to sustainable development</li> <li>c) Strengthening institutional cooperation and coordination will enhance good governance of the environment and natural resources in the country.</li> <li>d) Contributing to employment opportunities, sustainable use of natural resources, and economic growth.</li> </ul>

National Priorities	Consistency of the project with the national priorities
<p><b>National Biodiversity Strategy and Action Plan (NBSAP)[3]<sup>5</sup></b></p> <p>The National Biodiversity Strategy and Action Plan (NBSAP) is a multi-sectoral planning instrument for protection of biodiversity in Botswana. The NBSAP's vision is based on the principles of sustainable development, integrated conservation and development, equity across generations, and biodiversity as the foundation of life and livelihoods. The vision is, "by 2025, ecosystems, species and genetic diversity are 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". The goal of the NBSAP is to ensure that 1) Biodiversity is mainstreamed and valued across all sectors of society; 2) The pressure on biodiversity is reduced and natural resources are used sustainably; 3) Ecosystems, species and genetic resources are protected through sound management; 4) Fair and equitable access to the benefits of biodiversity is secured; 5) Participatory planning, knowledge management and capacity-building are in place to support NBSAP implementation.</p>	<p>The EarthRanger project will immensely contribute to the achievement of the five elements of NBSAP's goal.</p>

National Priorities	Consistency of the project with the national priorities
<p data-bbox="240 277 716 338"><b>National strategic plans on protected area management</b></p> <p data-bbox="240 369 651 430"><b>National Policy and Strategy for the Conservation and Management of Elephants in Botswana 2003</b></p> <p data-bbox="240 459 800 852">The elephant population in Botswana is not threatened and is regarded as a natural resource of great economic potential. Being perhaps a third of the continental total population, Botswana's elephants are of great significance and represent a very great conservation success for the country. At the same time the elephants are the primary agent of ecological change over a large part of the country, are one of the major causes of human-wildlife conflict and source of international controversy. This presents unique management challenges, calling for a strategy that will be able to reconcile a number of complex issues.</p> <p data-bbox="240 884 764 915"><b>National Anti-Poaching Strategy (NAPS) 2013</b></p> <p data-bbox="240 917 800 1281">Natural resource management in Botswana is characterized by high levels of competition and conflict between conservation goals, economic development, and livelihoods. In response to the escalation of the wildlife crime in the country, the Government of Botswana, developed NAPS in 2013 aimed at curtailing illegal wildlife off-take and other related illegal activities. The primary rationale of NAPS is to attain conservation of natural resources in Botswana, sustain the country's wildlife populations and contribute positively to sustainable development.</p> <p data-bbox="240 1312 769 1373"><b>Wildlife Conservation Research Strategic Plan 2016-2020[5]</b></p> <p data-bbox="240 1388 800 1692">The Republic of Botswana's Wildlife Policy, 2013 provides clear guidelines under section 5.10 for the strengthening of research and monitoring. The objective is to research wildlife species, habitat, ecosystems and the value of wildlife resources. This strategy seeks to respond to the many policy directives provided in the Wildlife Policy of 2013 and the NBSAP by focusing research on long-term and short-term goals and six research themes.</p>	<p data-bbox="834 277 1295 308">The EarthRanger project will contribute to:</p> <p data-bbox="834 308 1385 396">(1) Improvement of anti-poaching activities (e.g., Earth Ranger will help the anti-poaching team to better monitor park boundaries).</p> <p data-bbox="834 396 1369 789">(2) Implementation of the National Anti-Poaching Strategy through (i) a coordinated approach to the enforcement of policies and legislation on wildlife conservation (ii) mobilisation of resources for the conservation and sustainable management of natural resources ? wildlife in particular ? and maintenance of Botswana's wilderness and protected areas (including WMAs); and (iii) ensuring a holistic and coordinated law enforcement approach to combating wildlife crime-related activities and therefore raise the profile of the country as a tourism destination</p> <p data-bbox="834 789 1369 974">(3) Wildlife Research Long-term Goal: To contribute to the conservation of biodiversity and sustainable use of wildlife in Botswana by conducting exemplary research and providing scientific information and advice to policymakers, resource managers, stakeholders, and the public.</p> <p data-bbox="834 974 1385 1310">(4) Wildlife Research Short term/Immediate Goal: To develop and implement a research strategy that will:(a) Provide science-based information on wildlife conservation and management options to support the implementation of the 2013 Wildlife Policy and the 2014 National Biodiversity Strategy and Action Plan;(b) Focus and coordinate wildlife research in Botswana on key wildlife conservation and management issues; and (c) Build wildlife research capacity in the country.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Policy on Gender and Development Policy (NPGAD)[6]<sup>6</sup> 2015</b>  The policy provides a framework for including a gender perspective in all activities of Government and other sectors, as well as civil society, thereby promoting equitable participation of women and men in transformative development. NDP 11 advocates for the development of effective National Gender Machinery and to ensure participation of partners and stakeholders.</p>	<p>The EarthRanger project under Safeguard Compliance Plans will support gender mainstreaming and enhance gender inclusivity thereby improving the implementation of Botswana's commitment to international and regional obligations.</p>
<b>Mozambique</b>	
<p><b>The Constitution of Mozambique</b>  Chapter I, Article 10, d) provides for the 'promotion of equitable economic, social and regional development of the country'. Chapter II, article 19, 1) seeks to strengthen the relationships with other countries for the consolidation of national independence, democracy and to recover, use and control natural wealth on behalf of the citizens. The constitution also caters to environmental management for the benefit of the people.</p>	<p>By ensuring that at least 2 Protected Areas are safeguarded through the provision of equipment, technologies, and technical capacity to the management staff, the EarthRanger project will contribute to sustainable management and utilization of natural resources and strengthening the relations with other countries as stated in the Constitution.</p>
<p><b>National Development Plan</b>  National Strategy for Development 2015 ? 2035 recognizes ecological richness, management, and tourism as treasures for the development of Mozambique.</p>	<p>Effective management of protected areas will improve the survival, abundance, and distribution of threatened species, many of which, e.g., elephants, lions, etc., are important tourist attractions in Mozambique. The EarthRanger project will support the reduction of illegal activities such as poaching, ensuring that forestry and wildlife survive and increasingly attract tourists.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Policies and laws for natural resource management, including conservation and management of Protected areas/wildlife conservation area</b></p> <p>1. Law No. 5/2017, replaces law No.16/2014, of 20<sup>th</sup> June on protection, conservation, and sustainable use of biodiversity. It also guides the establishment and management of the protected area</p> <p>2. Regulations of Law Nr. 16/2014 of 20 June, amended and republished by Law Nr. 5/2017 of 11 May, the Law on the Protection, Conservation and Sustainable Use of Biological Diversity</p> <p>3. National Strategy for Adaptation and Mitigation of Climate Change 2013 ? 2025 has the vision: ?Mozambique prosperous and resilient for climate change with the green economy in all social and economic sectors?.</p> <p>4. Law No. 35/2014: the law of the revision of penal code which criminalizes all the crimes against the natural resources in Mozambique.</p>	<p>The Project will contribute to sustainable management of protected areas and enhance conservation of biological diversity, environmental values and contribute to Mozambique?s green economy in line with the national policies and laws on natural resource conservation. The Project introduces the Protected area systems and associated technologies that improve the effectiveness of monitoring wildlife movement and providing a real-time response to illegal activities and human-wildlife conflict. The Project will build the capacity of key stakeholders, specially protected area staff, in the application of EarthRanger technology.</p> <p>With the real-time response, this project will help to reduce illegal and destructive activities, optimize the use of financial and human resources for restoration of degraded areas and mitigate climate change impacts.</p> <p>Data and evidence will be consistently available for the Ministry of Justice and Attorney General to operationalize the Penal Code and prosecute criminals.</p>
<p><b>National strategic plans on protected area management</b></p> <p>Strategic Plan for National Administration of Conservation Areas 2015 ? 2024: Mission: Organize and develop National System for Conservation areas and ensure sustainable and participatory use of biodiversity Development objectives: -Strengthen the national capacity to support conservation areas. -Set up a network of conservation areas -Ensure that benefits and costs are balanced. -Improve the well-being of local communities</p> <p>Strategic Agenda 2019 ? 2035 and National Forestry Programme for Mozambique The strategic objectives are: -Enhance food security and socio-economic development with a focus on local community involvement. -Strengthen resilience to effects of climate change and natural hazards -Build capacity and integrate principles of good governance in the forestry development</p>	<p>This project includes the provision of technical and technological capacity to make the National Administration for Conservation (ANAC) more active, effective, and operational in the protection and monitoring of protected areas.</p> <p>Given the infrastructure and technical capacity of ANAC, this project contributes to its institutional development.</p> <p>With a reduction of illegal activities and an increase in the number of visitors to the protected areas, more financial resources will be generated, and the benefit-sharing scheme boosted (e.g. 20% of the income received by protected areas is shared with local communities).</p> <p>The project will facilitate monitoring of forestry resources and stakeholders will benefit from data and information generated from the project.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Biodiversity Strategy and Action Plan (NBSAP)</b></p> <p>National Strategy and Action Plan for Biological Diversity of Mozambique (2015-2035).</p> <p>-Vision: In 2035, the ecological, socioeconomic, 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 use.</p> <p>-Mission for the next 20 years: To ensure the conservation of biodiversity through the integration, training, financing, and the strengthening of partnerships between the different sectors of society.</p> <p>The following are the priority action targets for Mozambique and the Aichi Biodiversity targets:</p> <p>-Target 3: By 2025, adopt and effectively implement policies and legal instruments for preventing and mitigating the impacts of human activities likely to cause biodiversity degradation.</p> <p>-Target 5: By 2035, reduce by at least 20% the area of critical ecosystems (that provide essential goods and services) under degradation and fragmentation.</p> <p>-Target 6: By 2025, have in place at least 30% of habitats of endemic and/or threatened flora and fauna species with strategies and action plans for their conservation.</p> <p>-Target 12: By 2030, rehabilitate at least 15% of the degraded ecosystems/habitats, restore its biodiversity and ensure its sustainability with a view to mitigating the effects of climate change and combating desertification.</p> <p>-Target 20: By 2020, strengthen national and international partnerships and establish innovative mechanisms for financing and supporting biodiversity programs.</p>	<p>Improvement in the management of the protected areas in Mozambique is consistent with provisions of NBSAP 2015 ? 2035. This project will improve the quality of law enforcement, relationships, and communication with local communities as well coordination amongst different institutions with a stake in sustainable management of protected natural resources and contribute to the achievement of Aichi targets.</p> <p>Furthermore, the project will contribute to resource mobilization through partnership arrangements to improve protected areas management.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Policy on Gender and Development</b></p> <p>Policy on Gender and Implementation Strategy  <b>Vision:</b> a society where women and men enjoy equal rights and opportunities, contribute and benefit from the development process  Key strategic interventions outlined in the Gender Policy relevant to this project are:</p> <ul style="list-style-type: none"> <li>-Legislation</li> <li>-Governance</li> <li>-Training and education</li> <li>--Productive resources and employment</li> <li>-Peace and conflict mediation</li> <li>-Information Communication and Technology</li> <li>-Environment and climate change</li> </ul>	<p>The Project will support gender equity and benefit men and women through training, employment, and access to resources without discrimination.</p>
<b>The Republic of Congo</b>	
<p><b>The Constitution of the Republic adopted on October 25, 2015</b></p> <p>The Constitution provides for the protection of rights of citizens and stipulates that, among other things, "every citizen has the right to a healthy, satisfactory and sustainable environment and has the duty to defend it". In addition, Title II, Article 35 provides for environment protection and conservation.</p>	<p>The EarthRanger Project will contribute to the effective management of the protected areas and attainment of the aspirations of the Constitution.</p>
<p><b>National Development Plan</b></p> <p>National Strategy for Sustainable Development (SNDD 2016-2025) designed to guide Government and other stakeholder actions for accelerated growth, job creation, and poverty reduction. It identifies the forestry and tourism sectors as engines of growth while emphasizing the importance of their sustainable management. The vision for forestry is to make the Congo one of the world leaders in certified tropical timber production, driven by an industry that applies sustainable forest management principles, conserves biodiversity, and ensures carbon sequestration. The Plan also emphasizes nature-oriented tourism, for which wildlife and its habitat are a <i>sine qua non</i>, making their effective management imperative.</p>	<p>The EarthRanger Project will support the implementation of National Development Plan strategies through effective management of the protected areas, increased conservation of tourist attractions, and promotion of the tourism industry. The Project will contribute to sustainable management of natural resources and biodiversity conservation in the Equatorial Forest landscape.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>Environmental Policies and Strategies:</b></p> <ul style="list-style-type: none"> <li>? National Environmental Action Plan (PNAE) adopted in 1996 by the Government</li> <li>? National Strategy and Action Plan for Biological Diversity, developed in 1999 and updated in October 2001</li> <li>? National Strategy and Action Plan on Climate Change</li> <li>? National Strategy for Sustainable Development (SNDD 2016-2025)</li> <li>? National Land Use Planning Scheme (SNAT),</li> <li>? National Hygiene Policy and Strategy</li> <li>? REDD+ strategy</li> </ul>	<p>The EarthRanger Project will support the government's policy of sustainable management of natural resources and environmental protection in collaboration with communities. The Republic of Congo is located within the Congo Basin, the world's second-largest forest basin, which is covered by dense Equatorial forests, the second-largest rainforest in the world to the Amazon, which has an exceptional diversity of fauna and flora spread over an area of 1,700,000 km<sup>2</sup>.</p> <p>The creation of protected areas has enabled biodiversity conservation alongside other forest uses such as timber concessions, mining, oil, and agro-industrial grants to companies thus setting values of natural resources.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National policies/plans and laws relating to natural resource management, including conservation and management of protected areas/wildlife conservation areas</b></p> <p><b>1- National Policies and Plans</b></p> <ul style="list-style-type: none"> <li>- National Forest Action Plan (PAFN)</li> <li>- National action program to combat desertification (PAN)</li> <li>- National plan for scientific and technical development (PNDST)</li> <li>- Strategic plan for agricultural recovery</li> <li>- National Strategy and Action Plan on the management of the bush-meat</li> <li>- Great Apes Survival Plan (GRASP)</li> <li>- Interim Post Conflict Program (PIPC)</li> <li>- National Food Security Program (PNSA)</li> <li>- UNESCO Man and Biosphere Program (MAB)</li> <li>- Forest-Environment Sector Program (PSFE)</li> <li>- Rural Development Master Plan (SDDR)</li> </ul> <p><b>2- Laws</b></p> <p>? Law 003/91 of 23 April 1991 on <b>environmental protection</b></p> <p>? Law 37/2008 of November 28, 2008 <b>on fauna and protected areas</b> defines the actors of wildlife protection by specifying that " <b>without prejudice to the powers of the judicial police</b> , the wildlife and hunting police are provided by the competent services of the Ministry in charge of Water and Forests ? (Article 95) and that? eco- guards ? contribute to the practice of wildlife and hunting police ?(Article 96), supplemented by Law No. 003/91 of 23 April 1991 on protection of the environment and Law No. 8-2010 of July 26, 2010 on the protection of the national cultural and natural heritage. This law modifies the provisions of law 48/83 of April 21, 1983 by defining the conditions for conservation and exploitation of wildlife, as well as Law 49/83 by fixing the taxes provided for by Law 48/83 of April 21, 1983,</p> <p>? Law n? 33-2020 of 8 July 2020 modifies provisions of law n ? 16-2000 of 20 November 2000 on the <b>revised Forest Code</b>.</p> <p>? Law n ? 16-2000 of 20 November 2000 on <b>the revised Forest Code</b>. Congolese criminal law comprises Law no. 1-63 of January 13, 1963, on the code of criminal procedure and the penal code. Law No. 1-63 of January 13, 1963, on the <b>Code of Criminal Procedure</b> defines the mission of the Congolese law enforcement authorities. It was updated by law no. 19/99 of August 15, 1999, amending and supplementing certain provisions of Law n ? 0-22 / 92 of August 20, 1992 on organization of judicial power. <b>The penal code</b> applicable in Congo is the ?penal code of French Equatorial Africa? as it applied during the colonial</p>	<p>The EarthRanger Project is in line with various environment and natural resource sector policies and strategic plans that promote wild fauna and flora conservation. In particular, the Project will enhance the management of protected areas as set out in the fundamental principles and general conditions for conservation and sustainable management of fauna, habitats, and ecosystems. The Project will also support surveillance of illegal activities and mitigate organized wildlife and forestry crime, and build institutional capacity for effective protection of resources under their mandate.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Strategic Plans for Management of Protected Areas</b></p> <p>The network of protected areas covers 43,275 km<sup>2</sup> or 13 % of the national territory. It distinguishes 17 types of areas: 04 national parks, 04 wildlife reserves, biosphere reserve, forest reserve, 03 sanctuaries of fauna (nature reserves), 01 community reserve, and 03 hunting grounds.</p> <p>To achieve 20% protected area coverage, the country is considering the creation of other protected areas. Increase in PA area will help to raise the level of biodiversity conservation in the country.</p> <p>The Ministry of Forest Economy is responsible for PA management where management involves Public-Private Partnership (PPP) in seven protected areas, representing 83.5% of the total area of the protected areas. There are other 10 protected areas under state management. PPP involves local communities and depends on the resources available.</p>	<p>The Project will support sustainable management of protected areas in line with the national strategic plans. The involvement of partners is based on the private-public partnership arrangement by Government.</p>
<p><b>National Biodiversity Strategy and Action Plan (NBSAP)</b></p> <p>Vision of the NBSAP: by 2030, the security of Congo's biological resources is ensured through better knowledge of their components and sustainable management that integrate human capacity development, socio-economic development and equitable redistribution of profits while complying with international commitments. Strategic directions of NBSAP include reduce threats to biodiversity, strengthening cooperation and mobilization of actors for biodiversity conservation and strengthened local and national governance of biodiversity<sup>[7]</sup>.</p>	<p>The project will contribute to sustainable development and poverty reduction through better management of biological diversity. The NBSAP aims to safeguard and enhance terrestrial ecosystems, inland water ecosystems and marine and coastal ecosystems. In addition, it will promote access to biological diversity resources and the equitable sharing of the benefits arising from its exploitation, enhance agro-systems and strengthen institutional and legal framework.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>Regional Legal Frameworks</b></p> <p>At the continental level, the Republic of the Congo has adhered to the general convention of cooperation in matters of justice known as of Antananarivo of 1961, and to the extradition convention between the governments of the member states of the Economic and Monetary Community of Central Africa (CEMAC) of January 28, 2004. As a member of the African Union, the country is party to the African Union Convention on the prevention and fight against corruption of 2003. Congo is a member of the Lusaka Agreement (September 8, 1994) on concerted enforcement operations targeting illegal trade in wild flora and fauna.</p>	<p>The Project promotes regional integration and international initiatives to protect wildlife and sustainably manage natural resources for the benefit of national and international stakeholders. Improved management through application of EarthRanger technology will support tracking and control of illegal activities inland and across borders including trade in endangered species of wild fauna and flora.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>International Legal Frameworks</b></p> <p>The Government of the Republic of Congo has ratified various conventions/international agreements and protocols on environment including:</p> <ol style="list-style-type: none"> <li>i. Washington Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES),</li> <li>ii. Convention on Biological Diversity (CBD), ratified on June 25, 1996.</li> <li>iii. Convention on the World and Cultural Heritage (CPMC);</li> <li>iv. Convention on Migratory Species of Wild Animals.</li> <li>v. London Convention for the Conservation of Fauna and Flora in their Natural State.</li> <li>vi. Ramsar Convention or convention on wetlands of international importance particularly as waterfowl habitat.</li> <li>vii. The International Plant Protection Convention and the Montreal Protocol on Substances that Deplete the Ozone Layer.</li> <li>viii. United Nations Framework Convention on Climate Change (UNFCCC).</li> <li>ix. Vienna Convention for the Protection of the Ozone Layer</li> <li>x. Desertification Convention.</li> <li>xi. Convention on Drought and / or Desertification in Africa</li> <li>xii. Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal.</li> <li>xiii. Stockholm Convention on Persistent Organic Pollutants.</li> <li>xiv. Rotterdam Convention on the Prior Informed Consent Procedure Applicable to Certain Hazardous Chemicals and Pesticides in International Trade.</li> <li>xv. Kyoto Protocol.</li> <li>xvi. Protocol on Sustainable Development.</li> <li>xvii. Cartagena Protocol on Biosafety.</li> <li>xviii. Nagoya Protocol on the Equitable Sharing of Natural Resources.</li> <li>ix. United Nations Convention against Transnational Organized Crime and related protocols</li> </ol>	<p>The Earth Ranger project will support the country to comply and further fulfill the rules in the implementation of activities thereby domesticating the international agreements.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National Policy on Gender and Development</b> Strategy paper for poverty reduction and gender (2008 - 2010)</p> <p>The promotion and integration of women in development are elaborated in the National Policy whose objectives are:</p> <p>(a) Strengthening the capacities of women and the fight against inequality in social relations between the sexes through all its manifestations, whether individual, collective or institutional.</p> <p>(b) Gender mainstreaming in all sectors by all institutions, civil society organizations, the private sector, etc.</p> <p>On the other hand, the strategic axes of the national policy on gender revolve around:</p> <ol style="list-style-type: none"> <li>1. Mainstreaming gender in development institutions, programs and projects.</li> <li>2. Improving the productivity of women to increase their income.</li> <li>3. Improving access to production support services.</li> <li>4. Improving access to social services.</li> <li>5. Promotion of equitable participation in the management of power, respect for rights and suppression of violence.</li> <li>6. Strengthening institutional mechanisms</li> </ol>	<p>The project will integrate gender issues to reduce economic, cultural and social inequalities.</p>

National Priorities	Consistency of the project with the national priorities
<p><b>National REDD + strategy[8]<sup>s</sup></b>  Vision: By 2030, the diversification of the Republic of Congo's economy, following the standards and principles of conservation and sustainable ecosystem management, participatory management and poverty alleviation, is effective through green economy. The strategic and technical tools of the REDD process are in place and operational for the benefit of the national and international community."  The strategic options are:</p> <ol style="list-style-type: none"> <li>1. Strengthening governance and implementing sustainable financing mechanisms.</li> <li>2. Sustainable management and development of forest resources.</li> <li>3. Improving agricultural systems.</li> <li>4. Rationalization of woodlot production and use and promotion of clean energy; and</li> <li>5. Development of a green mining sector</li> </ol> <p>Under Option 2, the Strategy aims to improve forest conservation in protected areas through development and implementation of management plans, reduce management costs through local and indigenous peoples' participation, piloting co-management and generating economic benefits through ecotourism. The Strategy promotes conservation and sustainable use of biodiversity and the economic development of protected areas through ecotourism development. The Strategy also focuses on combating illegal logging and strengthening law enforcement, traceability via the Computer System for Verification of Legality and Traceability (SIVLT) and promoting good governance in the forestry sector.</p>	<p>Deployment of EarthRanger technology for effective management of protected areas will enhance conservation of biological diversity in protected areas and promote wildlife-based tourism to spur economic development. The Project will also help to mitigate illicit trade in wildlife and forest products.</p>

This project is consistent with and augments several regional and global environmental agreements related to biodiversity conservation and management of protected areas elaborated below.

- **Convention on Biological Diversity (CBD):** The goals are 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 human resource capacities of the PA authorities to conserve biodiversity and promote socio-economic development, human wellbeing, and ecological integrity. All the project participating countries (Botswana, Mozambique, and Republic of Congo) are party to the CBD and have developed 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 14:**

**Table 14 : Vision of each Target Country's NBSAP**

Country	Vision of the National Biodiversity Strategy and Action Plan (NBSAP)
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Country	Vision of the National Biodiversity Strategy and Action Plan (NBSAP)
<b>Botswana</b>	By 2025, ecosystem, species and genetic diversity is valued, protected, and used sustainably and equitably, through involvement of all sectors of society and provision of sufficient resources for its sound management (Botswana DEA, 2016[1]).
<b>Mozambique</b>	By 2035, the ecological, socio-economic and cultural value of biodiversity in THE country will contribute directly to improving the quality of life of citizens derived from its integrated management, conservation and fair and equitable utilization (Ministry of Land, Environment and Rural Development, 2015[2]).
<b>Republic of Congo</b>	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 and redistribution of equitable benefits while honoring international commitments (Ministre du Tourisme et de l'Environnement, 2015).

- **The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization**: it was adopted by the Parties to the Convention on Biological Diversity (CBD). The project participating countries (Botswana, Mozambique and Republic of Congo are party to the CBD and the Nagoya Protocol. The Nagoya protocol seeks to promote fair and equitable sharing of benefits arising from utilization of genetic resources.
- **African Convention on the Conservation of Nature and Natural Resources**: all the project participating countries (Botswana, Mozambique and Republic of Congo) are party to this convention. The objective of the 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. The convention recognizes the importance of natural resources e.g., flora, fauna, water and soil, to the well-being of Africans.
- **Convention on International Trade in Endangered Species (CITES)**: all the project participating countries (Botswana, Mozambique and Republic of Congo) are party to CITES. The 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.
- **Ramsar Convention**: it protects wetlands as important ecosystems for the maintenance of biodiversity. It recognizes the ecological importance of wetlands as regulators of hydrological regimes and habitats of specific flora and fauna species. All the project participating countries (Botswana, Mozambique and Republic of Congo) are party to the Ramsar convention.
- **United Nations Framework Convention on Climate Change (UNFCCC)**: it 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 gas effect caused by human activities and evaluates the extent to which they adversely affect the natural ecosystems and humankind. It also recognizes the role of terrestrial and marine ecosystems as carbon sinks. All the project participating countries (Botswana, Mozambique, and the Republic of Congo) are party to the UNFCCC and other key climate change conventions namely: **The Kyoto Protocol and The Paris Agreement**.
- **United Nations Convention to Combat Desertification (UNCCD)**: it seeks to combat desertification and mitigate the effects of drought in countries undergoing serious drought and/or desertification, particularly in Africa. UNCCD recognizes that desertification is caused by complex

interactions among physical, biological, political, socio-economic, and cultural factors. All the project participating countries (Botswana, Mozambique, and the Republic of Congo) are party to UNCCD.

- **Cartagena Protocol on Biosafety:** it establishes mechanisms to protect biodiversity and human health risks of Genetically Modified Organisms (GMOs). The Convention seeks to contribute to ensuring an adequate level of protection in terms of 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 project participating countries (Botswana, Mozambique, and the Republic of Congo) are party to the Cartagena Protocol on Biosafety.

- **Bonn Convention on Migratory Species (CMS):** Recognizes the importance of conservation of special habitats of migratory species. All the project participating countries (Botswana, Mozambique, and the Republic of Congo) are party to the CMS.

## 8. Knowledge Management

### **Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.**

The key knowledge management activities under this project will involve: hands-on training on EarthRanger Technology; sharing of project's lessons and success stories through participation at the Annual EarthRanger user conference by the project participating countries and other African countries. There will also be dissemination of information on EarthRanger and other conservation technologies through various modes of communication.

Success stories and lessons learnt from this project will be disseminated through the EarthRanger Website (<https://earthranger.com/About-Us.aspx>), other media outlets and social media platforms to be identified during the project implementation Phase. The project will also explore the potential of various national-level platforms and regional platforms, such as Southern African Development Community (SADC) Newsletter, <https://www.sadc.int/news-events/newsletters/>, and the global platforms such as the Knowledge Sharing Platform of the GEF-World Bank Global Wildlife Program (GWP), to share best practices and lessons learned. SADC Secretariat produces a monthly newsletter, 'Inside SADC', which could be utilized to share experiences and good practices to benefit the countries within and beyond the region. GWP has been instrumental in tackling the wildlife issues of poaching and illegal wildlife trade in countries of Asia and Africa (Botswana, Mozambique, and Republic of Congo inclusive) and coordinating outreach with partners, collaborators, and donors. The Project will also take advantage of any other social media platforms and other media outlets as they unveil during implementation.

It is anticipated that through widespread dissemination of EarthRanger's success stories, other African countries will gain interest to install and use conservation technologies to effectively manage their protected areas. Regarding storage of data, the project will build on and enhance existing systems to ensure that data are sent to the central repository following a systematic channel and at each level, a copy of the data will be retained as back-up. Knowledge management for the project will be achieved through relevant outputs with activities and targets focused on information collation and sharing. The details are provided by Project Component in **Table 15**.

**Table 15: Knowledge management outputs with associated timelines and indicative budget allocation**

Relevant KM Outputs	Activities for knowledge management	Target	Timing[1]	Budget (USD)[2]
<b>Component 2: Learning, knowledge sharing and scaling the EarthRanger technology across Africa</b>				

<b>Output 2.1.1:</b> Annual learning and knowledge sharing event (EarthRanger User Conference) undertaken by each PA	Support stakeholders from the target PAs to attend the Annual regional EarthRanger User Conference	Stakeholders from the target PAs attend the Annual regional EarthRanger User Conference	Annual	<b>331,382</b>
<b>Output 2.1.2:</b> Information sharing events undertaken to enhance learning and promote scaling up.	a. Hold Annual national and Regional virtual events on Earth Ranger experience b. Regional women's ranger learning/knowledge exchange summit c. Consolidate commitment of African countries to utilize EarthRanger Technology	Events will provide opportunity for knowledge sharing among the stakeholders Printing of materials	Annual	
<b>Output 2.1.3:</b> Success stories, lessons learnt and best practices published and shared on blogs, websites and other digital platforms (where the Earth Ranger software informed decisions in management effectiveness of PAs).	(i) Develop the capacity of PA staff for effective documentation and digital information sharing (ii) Prepare and disseminate an article that highlights 1-2 women who have benefitted from the project (and the targeted efforts of the project to support women in this field). (iii) Document progress of Earth Ranger implementation experience (Newsletter, stories, fact sheets, brochures, etc.) (iv) Translation of documents (English, French, Portuguese) (v) Protected area Management Authorities to upload Earth Ranger experiences on their websites as appropriate (vi) PA partners to Upload Earth Ranger Experiences onto their websites as appropriate	? Newsletters ? Fact sheets ? Stories ? Blog posts ? Printing of training materials	Bi-annual	
<b>TOTAL</b>				<b>331,382</b>

**Note:** The USD 331,382 under Component 2 covers staff time, conferences, and consultancies (such as translation services).

## 9. Monitoring and Evaluation

### Describe the budgeted M and E plan

Project monitoring and evaluation will be conducted in accordance with established Conservation International and GEF procedures. The project's M&E plan will be presented and finalized at the project inception workshop, including a review of indicators, means of verification, and the full definition of project staff M&E responsibilities.

#### A. Monitoring and Evaluation Roles and Responsibilities

**The Project Management Unit (PMU)** will be responsible for initiating and organizing key monitoring and evaluation tasks but will utilize the country-level project counterparts (Partners) at each of the PAs. 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.

**The National Project Steering Committees** play a key oversight role for the project, with regular meetings to receive updates on project implementation progress and approve annual work plans. The Project Steering Committee also provides continuous ad-hoc oversight and feedback on project activities, responding to inquiries or requests for approval from the Project Management Unit or Executing Agency.

**Key project executing partners** are responsible for providing information and data for timely and comprehensive project reporting, including results and financial data, as necessary and appropriate.

**The CI-GEF Project Agency** plays an overall quality assurance, backstopping, and oversight role in monitoring and evaluation of project activities and resource use.

**The CI General Counsel's Office with the Grants and Contracts Unit** is responsible for contracting obligations and providing oversight of the independent mid-term and end of the project evaluations.

#### B. Monitoring and Evaluation and Project Management Cost's (PMCs) activities

The Project M&E and PMC Plan include the following components:

##### a. Inception workshop

Project inception workshops will be held with the project stakeholders at the country level within the first three months of project start. The overarching objective of the inception workshop is to assist the project team to understand and take 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. Inception workshop Report

The Executing Agency (PMU) shall produce an inception report documenting all changes and decisions made, during the inception workshop, to the planned project activities, budget, results framework, and other key aspects of the project. The inception report shall be produced within one month of the inception workshop, as it will serve as a key input to the timely planning and execution of project start-up and detailed project activities.

c. **Project Results Monitoring Plan** (Objective, Outcomes, and Outputs)

A Project Results Monitoring Plan will be developed by the Project Agency, which 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 and analysis, responsible parties, and indicative resources needed to complete the plan. Appendix III is the Project Results Monitoring Plan that will be reviewed and updated during the start-up period. **Table 16** is a summary of the Monitoring Plan, and the associated costs and **Table 17** indicates the project management costs.

In addition to the objective, outcome, and output indicators, the Project Results Monitoring Plan will also include all indicators identified in the Safeguard Plans prepared for the project, thus permitting consistent and timely monitoring.

Monitoring of these indicators throughout the life of the project will be necessary to assess if the project has successfully achieved the expected results.

**Baseline establishment:** in the event that baseline data are not collected during the PPG phase, it will be collected and documented by the relevant project partners within the first year of project implementation.

d. **GEF Core Indicator Worksheet**

The relevant section of the GEF Core Indicator Worksheet was updated for the CEO endorsement submission. This worksheet will also be updated two times during project implementation: i) prior to project mid-term evaluation, and ii) at project completion.

e. **Project Steering Committee Meetings (national level)**

Project Steering Committee (NSC) meetings will be held annually in each of the participating countries. Meetings shall be held to review and approve project annual work plans and budgets, discuss implementation issues and identify solutions, and to increase coordination and communication between key project partners.

f. **CI-GEF Project Agency Field Supervision Missions**

The CI-GEF PA will conduct annual visits to the project country and field sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess, firsthand, the project's progress. Oversight visits will be conducted to coincide with the timing of PSC meetings to enable members of the PSC to participate in the field visits. Field Visit Report will be prepared by the CI-GEF Project Agency staff participating in the oversight mission and circulated to the project team and PSC members within one month from the time of the visit.

g. **Quarterly Progress Reporting**

The Project delivery partner will submit quarterly technical and financial reports to the CI-GEF Project Agency, including requests for disbursement of funds to cover expected quarterly expenditures. The Project delivery partner may be required to submit financial reports more frequently as deemed fit.

h. **Annual Project Implementation Report (PIR)**

The Project delivery partner will prepare an annual PIR to monitor progress made since the project start and for the reporting period (July 1st to June 30th). The PIR will summarize the annual project results and progress. A summary of the report will be shared with the Project Steering Committee.

i. **Final Project Report**

The Executing Agency support partner (CI AfFD) will prepare a final report at the end of the project. The report will be one of the resource materials consulted by the terminal evaluation consultant.

j. **Independent External Mid-term Review**

The project will undergo an independent mid-term review within 30 days of the mid-point of the grant term. The mid-term review will report the progress made towards the achievement of outcomes and will identify and elaborate on the mitigation measures to address shortcomings in the project. The mid-term review will highlight issues to be addressed by the EA, Executing Agency Support partner (CI AfFD), PSC, and other stakeholders, actions required, and lessons learnt in project design, implementation, and management. Findings and recommendations of the mid-term review will be addressed to secure maximum project results and sustainability during the second half of project implementation.

k. **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 project's results as initially planned and as corrected after the mid-term evaluation. The Executing Agency and the Executing Agency Support partner (CI AfFD) in collaboration with the PSC, will provide a formal management response to the queries raised in the evaluation report indicating the extent to which they have been addressed.

l. **Financial Statements Audit**

Annual Financial reports submitted by the executing Agency will be audited annually by external auditors appointed by the Executing Agency Support partner (CI AfFD). This is part of the PMC budget.

The Terms of References for the evaluations will be drafted by the CI-GEF Project Agency in accordance with GEF requirements. The procurement and contracting for the independent evaluations will be handled by CI's General Counsel's Office. The funding for the evaluations will come from the project budget, as indicated at project approval.

**Table 16: M&E Plan Summary**

Type of M&E	Reporting	Responsible	Indicative Budget
	Frequency	Parties	from GEF (USD)
a. Inception workshop	Within three months of signing of CI Grant Agreement for GEF Projects	? Project Team	2,500
		? Executing Agency	
		? CI-GEF PA	
b. Inception workshop Report	Within one month of inception workshop	? Project Team	13,148
		? CI-GEF PA	
c. Project Results Monitoring Plan (Objective, Outcomes and Outputs)	Annually (data on indicators will be gathered according to monitoring plan schedule shown on Appendix IV)	? Project Team	26,295
		? CI-GEF PA	
d. GEF Indicator Tracker	i) Project development phase; ii) prior to project mid-term evaluation; and iii) project completion	? Project Team	7,168
		? Executing Agency	
		? CI-GEF PA	
f. CI-GEF Project Agency Field Supervision Missions	Approximately annual visits	? CI-GEF PA	<i>*paid by Agency fees</i>
h. Annual Project Implementation Report (PIR)	Annually for year ending June 30	? Project Team	7,168
		? Executing Agency	
		? CI-GEF PA	

i. Project Completion Report	Upon project operational closure	? Project Team	13,147
		? Executing Agency	
j. Independent External Mid-term Review	Approximate mid-point of project implementation period	? CI Evaluation Office	20,500
		? Project Team	
		? CI-GEF PA	
k. Independent Terminal Evaluation	Evaluation field mission within three months prior to project completion.	? CI Evaluation Office	24,310
		? Project Team	
		? CI-GEF PA	
<b>Summary M&amp;E total</b>			<b>114,236</b>

**Table 17: Project Management Costs (PMC) Summary**

Type of PMC	Reporting	Responsible	Indicative Budget
	Frequency	Parties	from GEF (USD)
a. Project Steering Committee Meetings	Annually	? Project Team	51,730
		? Executing Agency	
		? CI-GEF PA	
b. Quarterly Progress Reporting	Quarterly	? Project Team	51,731
		? Executing Agency	
c. Financial Statements Audit	Annually	? Executing Agency	10,775
		? CI-GEF PA	
<b>Summary PMC total</b>			<b>114,236</b>

**10. Benefits**

**Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?**

At the 1992 Earth Summit, the governments of the world agreed on a new agenda for sustainable development which included the Convention on Biological Diversity (CBD) which, among others, called on governments to establish systems of protected areas and to manage these in support of conservation, sustainable use and equitable socio-economic benefit sharing. The governments recognized protected areas as socio-economic institutions which have a key role to play in the alleviation of poverty and maintenance of the global community's critical life-support systems. This vision for protected areas requires an awareness and understanding of the socio-economic values of protected areas.

Delivery of socio-economic benefits to local communities and at the national level is an integral aspect of both AI2 and GEF-funded projects. Demonstrating the socio-economic importance of protected areas in this project will significantly increase political and stakeholder support, help to resolve conflicts between different interest groups, lead to positive changes in policies and decision-making and unravel alternative and sustainable sources of financing the management of the protected area. Insights provided by this project will help to identify a combination of actions and land-use practices that best support sustainable and equitable access to, and utilization of socio-economic benefits derived from protected areas while retaining the conservation goals.

Protected areas (PAs) are the cornerstone of biodiversity conservation. This project recognizes the role of protected areas in the protection of species and ecosystems and will contribute to the achievement of Convention on Biodiversity's Aichi strategic Goals A, B, C, D, and E and Targets 1, 11, and 12 that will, in turn, enhance the socio-economic benefits of protected areas' species and ecosystems in the project participating countries.

Given the dependence of the national economies on natural resources, including wildlife-based tourism in protected areas, in the project participating countries, improved management of the resources will enhance benefits to the economy and the local population. In protected areas where local communities receive direct socio-economic benefits through established benefit-sharing arrangements in the form of support to alternative livelihoods and improved agricultural methods, improved management will enhance the socio-economic benefits through the sustainable generation of revenue.

The project will improve protected area management approaches, enhance adaptive capacity, reduce the vulnerability of wildlife and the target protected areas in the project countries and enhance their resilience. In this regard, resilience refers to the ability of a protected area system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event or trend or disturbance in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions while maintaining the capacity for adaptation, learning, and transformation. Three dimensions of resilience that will be considered in this project are buffer capacity (resources that will buffer shocks and stresses); self-regulation (the degree to which protected area managers will direct their actions and outcomes), and learning (experimenting, innovating, and integrating experiences into action).

In order to deliver the socio-economic benefits of the project, the following will be taken into account during project implementation:

- **Climate Resilience:** In the context of this project, climate resilience is the ability of protected area managers to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience of protected areas involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks. Climate change is a fundamental phenomenon in protected area management because it results in ecologically significant changes in species abundance, composition, diversity, physiology, community composition, biotic interactions, and behavior including feeding and breeding success which the EarthRanger technology will help to monitor. Wild animals, therefore, face new challenges for survival because of differential responses by species to climate change which alter the ecosystems and habitats.
- **Ecological resilience:** is the capacity of a system to undergo disturbance and reorganize so as to still maintain essentially the same functions, structures, and controls. Effective management of protected areas requires an understanding of the ecosystem's response to the stressors and disturbances in order to guide technology-assisted management actions. The application of EarthRanger technology provides the additional ability for managing protected areas to enhance their resilience to cope with stressors and disturbances. The EarthRanger technology will facilitate real-time data collection and processing, which will deepen understanding of the factors influencing the ecological resilience of the target protected areas, interactions of biological resources, their variability, and the capacity to support habitats and species.

Furthermore, the EarthRanger technology will enable the integration of geospatial information with data on resources, habitats, species, and ecosystem disturbance all of which constitute the foundation for resilience-based management of the target protected areas. Effective management (particularly enhanced response to wildlife crime) and monitoring and analysis of the status of resources will contribute to a sustained flow of ecological goods and services and the attendant benefits to the project participating countries.

- **Social-ecological resilience:** this connotes the capacity to continue functioning despite stresses or shocks. To ensure ecological resilience to environmental change, protected area managers in the project participating countries will require a proactive response to new conditions that will maintain ecosystem functionality, connectivity, and adaptive capacity.
- **Improved management frameworks:** The project will enhance decision-making and planning for improved protected area management, resource use, and sustainability of socio-economic activities such as tourism and ecotourism. Natural resources data collected and analyzed in this project using the EarthRanger will be shared with different government entities to guide and inform policy, strategic planning, and decision making. Building human capacity through training and technical support to collect, assess and report quality data and to identify, respond and manage the current and future threats to protected areas will increase science-based decision-making thus enhancing the coping strategies of the adjacent local communities in the project participating countries.
- **Food security:** Food and nutrition security is a critical socio-economic parameter of livelihoods and food insecurity can drive local people to engage in wildlife crimes such as bushmeat hunting. The EarthRanger project will increase the capacity of project countries to plan, monitor, analyze and link protected area data to agricultural production and productivity in the surrounding areas which largely account for sustainable food and nutrition security. Furthermore, forestry and related natural resources are critical to the project countries' socio-economic development as they provide environmental support to food production, biodiversity conservation, protection of water catchments, and soil and water conservation among others. Health is interrelated with the environment, climate, water, and food and nutrition security. A combination of these factors increases local communities' resilience to the effects of climate change impacts and related shocks that may affect the protected areas in their proximity.

## 11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

### Overall Project/Program Risk Classification \*

PIF	CEO Endorsement/Approva I	MTR	TE
<b>Medium/Moderate</b>			

#### Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

Justification: The proposed project has the potential to cause adverse environmental and social impacts on human populations or environmentally or socially important areas. However, these impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects.

During the Project Preparation Grant (PPG) phase of the project, the proposed project activities were screened using the CI-GEF's Safeguard Screening Form. The screening forms were submitted to the CI-GEF Project Agency, after which the recommended safeguard plans were developed. The summary of the screening results is presented in **Table 18**. The detailed Safeguard screening results report is provided in Appendix VI.

**Table 18: Safeguard Screening Results**

ESS Standards	Yes	No	TBD	Justification
ESS 1: Environmental & Social Impact Assessment	X			<i>The project is proposing activities that cause physical and economic displacement and other impacts i.e. construction or refurbishment of infrastructure in protected areas.</i>
ESS 2: Protection of Natural Habitats and Biodiversity Conservation		X		<i>The project is not proposing activities that cause physical and economic displacement or other impacts on natural or critical natural habitats. The project complies with applicable international environmental treaties and does not plan to introduce or use potentially invasive, alien species.</i>
ESS 3: Resettlement and Physical and Economic Displacement		X		<i>The project will not engage in the resettlement of people or cause physical and economic displacement.</i>
ESS 4: Indigenous Peoples		X		<i>The project does not plan to work in lands traditionally owned, customarily used, or occupied by indigenous peoples.</i>
ESS 5: Resource Efficiency and Pollution Prevention		X		<i>There are no proposed activities related to the use, storage, handling, or disposal of restricted or prohibited substances, chemicals, or hazardous materials.</i>
ESS 6: Cultural Heritage		X		<i>The project does not plan to work in areas containing cultural heritage, both tangible and intangible, or other sensitive cultural resources.</i>
ESS 7: Labor and Working Conditions		X		<i>The EA has in place the necessary policies, procedures, systems and capabilities that meets the requirements of the ILO Conventions.</i>
ESS 8: Community Health, Safety and Security		X		<i>The project does not anticipate risks to community health, safety and security but the pandemic measures will be implemented during the implementation of project activities.</i>
ESS 9: Private Sector Direct Investments and Financial Intermediaries		X		<i>The project does not plan to make either direct investments in private sector firms, or channels funds through financial intermediaries.</i>
ESS 10: Climate Risk and Related Disasters		X		<i>Moderate risk: The project areas are projected to experience increased temperatures and variable precipitation patterns that may lead to flooding, droughts (desertification), and other climate-related risks. The project is specifically designed to strengthen the institutional and technical capacity of the countries to assess and manage the projected impact of climate change. The project will implement measures to manage the management effectiveness of priority projects and to serve to mitigate against the impact of climate change.</i>

**Supporting Documents**

Upload available ESS supporting documents.

Title	Module	Submitted
<b>20211201_ Earth Ranger Safeguard Screening Analysis Results</b>	<b>CEO Endorsement ESS</b>	
<b>20211122_ Safeguard Screening_ER Form_CIGEF_</b>	<b>CEO Endorsement ESS</b>	
<b>20211201_ ESIA_ESMP_EarthRanger</b>	<b>CEO Endorsement ESS</b>	
<b>20200320 Earth Ranger Preliminary Safeguard Screening Analysis Results</b>	<b>Project PIF ESS</b>	

**ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).**

<b>Project Objective:</b>	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.		
<b>Indicator(s):</b>	<ol style="list-style-type: none"> <li>1. Number of countries with EarthRanger protected area management system and related technologies compliant with PA needs.</li> <li>2. Area of terrestrial protected areas under improved management effectiveness by use of EarthRanger protected area management system and related technologies (Target: 4,901,650 ha<sup>[1]</sup>).</li> <li>3. Total number of direct beneficiaries (disaggregated by gender) skilled to utilize EarthRanger Protected Area Management system and related technologies (Target: 162 direct beneficiaries (at-least 15% Female<sup>[2]</sup>).</li> <li>4. Number of additional African countries interested and committed to install Earth Ranger technology or other PA management technologies. (Target: At least 3 African countries).</li> </ol>		
<b>Expected Outcomes and Indicators</b>	<b>Project Baseline</b>	<b>End of Project Target</b>	<b>Expected Outputs and Indicators</b>
<b>Component 1: Installation of EarthRanger software together with other required technologies and infrastructure to achieve EarthRanger readiness</b>			

<p><b>Outcome 1.1.:</b> Strengthened institutional and technical capacity of participating countries to effectively manage protected areas.</p> <p><i>Outcome Indicator 1.1:</i> Hectares of protected areas with improved METT[3] score</p> <p><i>Outcome Indicator 1.2:</i> Number of protected areas in the participating countries utilizing EarthRanger technology to manage the PAs</p>	<p><b>Baseline Indicator 1.1:</b> All the 6 target PAs with cumulative total of 4,901,650 Ha have not installed the Earth Ranger technology hence might register a low METT score.</p>	<p><b>Target 1.1:</b> At least 4,901,650 hectares of protected areas with improved METT scores</p> <p><b>Target 1.2:</b> All the 6 target protected areas in the participating countries utilizing EarthRanger technology to manage the PAs</p>	<p><b>Output 1.1.1:</b> Earth Ranger software incorporated in the existing PA management structure in the target countries.</p> <p><i>Indicator 1.1.1.: Number of PAs utilizing EarthRanger technology to manage the PAs.</i></p> <p>Target 1.1.1: All the 6 target protected areas in the participating countries utilizing EarthRanger technology to manage the PAs</p> <p><b>Output 1.1.2:</b> A dedicated, secure, and functional control room facility established to be used by management to improve real-time situational awareness through deployment of EarthRanger technology in each PA in the target countries.</p> <p><i>Indicator 1.1.2: Number of functional control rooms running on EarthRanger software, equipped with reliable power and LAN together with the required computer hardware.</i></p> <p>Target 1.1.2: All the 6 Protected Areas in the target countries with fully equipped control rooms running EarthRanger software</p> <p><b>Output 1.1.3:</b> Required built infrastructure and internet network capabilities installed in the selected protected areas in the target countries.</p> <p><i>Indicator 1.1.3. Number of PAs with built infrastructure and internet network (WAN) capabilities installed and functional.</i></p> <p>Target 1.1.3: Built infrastructure and internet network capabilities installed and functional in the six selected PAs in the target countries</p>
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**Component 2: Learning, knowledge sharing and scaling the EarthRanger technology across Africa**

<p><b>Outcome 2.1:</b> Additional PAs in Africa are identified and the respective Countries commit to install the EarthRanger technology.</p> <p><i>Outcome Indicator 2.1:</i> Number of additional PAs identified, and number of African countries committed to install the EarthRanger software and other technologies (GEF8 LoEs, Co-financing pledges)</p>	<p><b>Baseline Indicator 2.1:</b> Not all protected area management institutions and managers in Africa are utilizing the Earth Ranger Technology to enhance PA management effectiveness.</p>	<p><b>Target 2.1:</b> At least 6 new PAs identified, and 3 African countries committed to install Earth Ranger Technology in GEF8</p>	<p><b>Output 2.1.1.:</b> Annual learning and knowledge sharing event (EarthRanger User Conference) undertaken by each PA</p> <p><i>Indicator 2.1.1.:</i> Number of Learning visits (EarthRanger User Conference) undertaken by each PA.</p> <p>Target 2.1.1: At least 1 learning visit (EarthRanger User Conference) undertaken by each PA once during the duration of the project</p> <p><b>Output 2.1.2:</b> Information sharing events undertaken to enhance learning and promote scaling up.</p> <p><i>Indicator 2.1.2:</i> Number of information sharing events</p> <p>Target 2.1.2: At least 1 information-sharing event held per target country per year.</p> <p><b>Output 2.1.3.:</b> Success stories, lessons learnt and best practices published and shared on blogs, websites, and other digital platforms (where the EarthRanger software informed decisions in the management of PAs).</p> <p><i>Indicator 2.1.3.:</i> Number of success stories, lessons learnt and best practices published and shared on blogs, websites (where the Earth Ranger software informed decisions in management of PAs).</p> <p>Target 2.1.3: At least 6 success stories, lessons learnt, and best practices shared by the project team during the project's lifetime (At least 2 success stories, lessons learnt, and best practices shared by the project annually)</p>
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<b>Component 3: Monitoring and Evaluation</b>			
<p><b>Outcome 3.1:</b> An integrated monitoring and evaluation framework for the project</p> <p><i>Outcome indicator 3.1:</i> Number of M&amp;E reports submitted to the CIGEF Agency for review and approval, and the Number of Evaluations conducted by CIGEF</p>	<p><b>Baseline Indicator 3.1:</b> No M&amp;E framework for the Project</p>	<p><b>Target 3.1:</b> Periodic technical and financial reports submitted to CIGEF for review and approval: <i>At least 3 Annual Workplans and Budget, 12 Quarterly Reports, 3 Annual Progress Implementation Reports (PIRs)</i></p> <p><b>Target 3.2:</b> At least 2 Evaluations conducted by CIGEF: <i>1 Mid-Term Evaluation and 1 Terminal Evaluation</i></p>	<p><b>Output 3.1.1:</b> Periodic M&amp;E reports submitted to CIGEF Agency</p> <p><i>Indicator 3.1.1:</i> Number of Annual and Quarterly M&amp;E Reports submitted to CIGEF for review and approval.</p> <p>Target 3.1.1: At least 3 Annual Workplans and Budget, 12 Quarterly Technical and Financial Reports; and 3 Annual Progress Implementation Reports (PIRs) submitted to CIGEF for review and approval.</p> <p><b>Output 3.1.2:</b> Mid-Term Evaluation and Terminal Evaluation conducted by CIGEF</p> <p><i>Indicator 3.1.2:</i> Number of Mid-Term and Terminal Evaluations conducted by CIGEF</p> <p>Target 3.1.2: One Mid-Term Evaluation and One Terminal Evaluation conducted by CIGEF</p>

[1] Based on the selected PAs

[2] Presented in the core indicator sheet ? Appendix V

[3] 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>

## **ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).**

**Response to Project Reviews: STAP**

PART	STAP COMMENTS	RESPONSE	SECTION IN THE PRODOC & PARAGRAPH
<b>STAP Overall Assessment and Rating</b>	An explicit theory of change is not provided and many of the important details will be provided during the PPG phase, including the specific protected areas and stakeholders. This is an omission and shortcoming of the proposed project, as it seems to have been developed in haste. However, given the very targeted nature of the intervention and the past success of EarthRanger, STAP feels it is likely that the details can reasonably be worked out during PPG phase	A theory of Change is provided in the ProDoc	Section 2 (part H)
<b>Part 1: Project description. Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)</b>	The threats are well articulated for each of the target countries in general and share some similarities (i.e., habitat destruction, HWC) as well as some unique challenges in each. <i>Underlying drivers are not described in any detail, though population growth and political instability are mentioned. Lack of funding is a chronic problem.</i>	The threats and underlying drivers (root causes) have been elaborated at country level and for the selected protected areas	Section 2 ( part D and E)

PART	STAP COMMENTS	RESPONSE	SECTION IN THE PRODOC & PARAGRAPH
<p><i>Are the barriers and threats well described, and substantiated by data and references?</i></p>	<p>Barriers are not country-specific and don't explicitly say what they are a barrier to, but presumably they are barriers to achieving the overall objective, which is to strengthen Protected Area management effectiveness in Africa's National Parks.</p> <p>? The link that is missing is between doing this (strengthened management) and reducing the various threats across countries (habitat loss, poaching, fire, climate change, logging, HWC, sustainable agriculture, pollution, IAS). The project would be greatly improved by carefully and explicitly articulating how the incorporation of EarthRanger into PA management would address these threats.</p>	<p>The relevant sections have been revised, with case studies to demonstrate the contribution of Earth Ranger to strengthening management. The examples from the provided case studies demonstrate that the deployment of EarthRanger reduced Human-Wildlife conflict in Malawi, improved park boundary monitoring in Tanzania and thus reducing poaching, improved ecological monitoring in Kenya and thus address issues of fire and habitat loss. The ER will thus build capacity at PA level to enhance ecological monitoring and information sharing to help address the identified threats across the six selected PAs.</p>	<p>Section 2 (E), paras 80 - 85</p>

PART	STAP COMMENTS	RESPONSE	SECTION IN THE PRODOC & PARAGRAPH
<p><i>What is the theory of change?</i></p>	<p><i>No theory of change is presented. This is a major limitation of the project proposal. It assumes a straight line between technology deployment and results (in this case improved management and with it the additional underlying assumption that improved management will result in decrease in biodiversity loss).</i></p> <p><i>The project does not consider other elements that may be necessary for improved PA management such as those related to governance, policies, etc. Will these be addressed through other projects or other means? Will benefits still be achievable without these other factors being addressed?</i></p>	<p>? A text on Theory of Change has been added to show the link between the problem to be addressed, barriers or root causes and the project interventions and the anticipated positive changes. It also identifies key enablers for project success and the assumptions that will influence attainment of the expected outcomes and thus provides a link to governance and the policy frameworks.</p> <p>? A diagrammatic representation of the ToC is provided.</p>	<p>Section 2 (H)</p>
<p><i>What is the sequence of events (required or expected) that will lead to the desired outcomes?</i></p>	<p>Since the PAs have yet to be identified, STAP recommends that as a first step, <i>project proponents outline criteria for selection of parks with the greatest need as well as the highest likelihood of successful uptake over the long term</i> (i.e., where salaries of control operators will continue to be paid after GEF project funding ends).</p>	<p>6 Protected areas have been identified and a criterion for their selection provided.</p> <p>Co-financing and Sustainability are one of the aspects in the selection criteria</p>	<p>Section 3 (D) Paras 154 - 157</p>
	<p>Is there a recognition of what adaptations may be required during project implementation to respond to changing conditions in pursuit of the targeted outcomes?</p>	<p>A risk assessment was undertaken during project development and mitigation of risks proposed. In addition, the multi-stakeholder implementation framework has been designed to assure a consultative approach to project implementation in which key partners including PA managers, Civil society and private sector are engaged in the implementation.</p>	<p>Section 3 (F) and Section 5</p>

PART	STAP COMMENTS	RESPONSE	SECTION IN THE PRODOC & PARAGRAPH
	With regards to durability, the only cost to continuing the project after the initial GEF investment is and the salaries of control room operators. This is of some concern given financial constraints facing many parks	Text provided in the ProDoc on implementation approaches and sustainability	Section 3 (Part G) on Sustainability and Section 5 on implementation.
<b>Project Map and Coordinates. Please provide geo-referenced information and map where the project interventions will take place</b>	Simple map of Africa with three countries highlighted is provided showing the selected PAs. As these are PAs, geo-coordinates can be identified using the WDPA dataset	A detailed map is provided.	Section II & Appendix XI
<b>Stakeholders</b>	<p>Have all the key relevant stakeholders been identified to cover the complexity of the problem, and project implementation barriers?</p> <p><i>To be identified during PPG phase as the PAs have not yet been identified. Stakeholders have been divided by government institutions, CSOs, private sector and other. Presumably local governments and communities and organizations will be included but this has not been made explicit.</i></p>	The Stakeholder Engagement Plan has been developed. The relevant stakeholders for each participating country have been identified, and categorized into Government institutions, CSOs, private sector and community organizations.	Stakeholder Engagement Plan, Appendix VII
<b>Gender Equality and Women's Empowerment:</b> Have gender differentiated risks and opportunities been identified, and were preliminary response measures described that would address these differences?	<p>Gender mainstreaming plan to be developed during PPG phase.</p> <p>If gender considerations hinder full participation of an important stakeholder group (or groups), how will these obstacles be addressed? <b>&gt;&gt;captured in the GMP</b></p>	<p>Gender Mainstreaming Plan developed to address the issues raised.</p> <p>Gender analysis has been conducted</p>	Appendix VII? Gender Mainstreaming Plan and relevant updates made in the project results framework

PART	STAP COMMENTS	RESPONSE	SECTION IN THE PRODOC & PARAGRAPH
<b>Risks:</b> Are there social and environmental risks which could affect the project?	No climate risk screening but not clear how that would be relevant for this project	A text is available on the relevance of climate to the project context. In addition, a risk assessment was undertaken during the project preparation	Section 1B- Paras 27- 55 provides for the project context In addition, Section 3F on risk assessment provides for risk mitigation
<b>Coordination. Outline the coordination with other relevant GEF-financed and other related initiatives</b>	This project will tap into the Global Wildlife Program, which encompasses Botswana, Mozambique and Congo and the Congo Basin Sustainable Landscapes IP which are ongoing. <i>Other projects are described but it's not clear that there is a connection between this proposed project and these other related GEF projects and how exactly they will relate.</i>	The relevant sections have been reviewed and updated to reflect the various projects at global, regional, and national level, and how these are linked to the EarthRanger Project. The project will also benefit from relevant global and regional platforms for information sharing on success stories and lessons learnt under component 2.	Section 3 (L), on linkages with other GEF Projects and relevant Initiatives; Paras 185; Table 13. Section 3 Paras 121 to 126 provide for approaches to information sharing.
Is there adequate recognition of previous projects and the learning derived from them?	<i>Yes, but mainly GEF projects. There are many other donors and organizations working in this space and in these countries.</i>	The lists have been reviewed and updated	Section 3 (B) on Associated baseline projects, para 133; and 134 Table 4.  Section 3 (L), on linkages with other GEF Projects and relevant Initiatives; Paras 185; Table 13

#### Response to Project Reviews: GEF Council Members

COMMENTS GEF COUNCIL MEMBERS	RESPONSE	SECTION IN THE PRODOC
<b>Germany</b>		
1. Some chapters of the PIF are incomplete or in a confusing order, such as 1. Project Description. 1 a) short project description is missing B	The sections have been rearranged and content revised to follow the CI-GEF template for preparing the Full-sized projects.	ProDoc Table of Contents

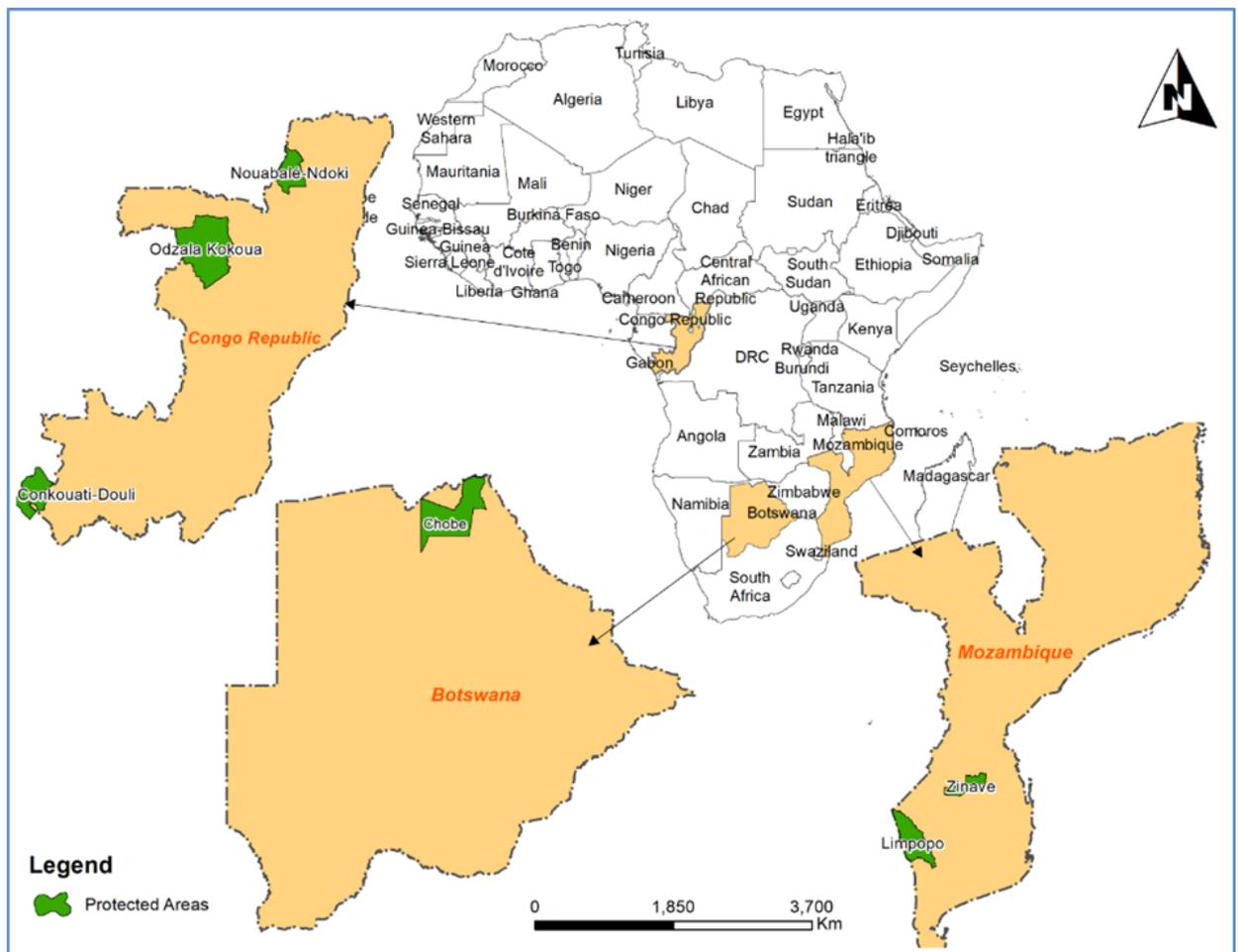
COMMENTS GEF COUNCIL MEMBERS	RESPONSE	SECTION IN THE PRODOC
<p>2. Baseline Scenario. It does not describe the baseline in the selected countries and what the status quo of the Monitoring System is. It should also reference to what extent existing forest Monitoring Systems could help create synergies ? particularly applied to Mozambique and RoC, where considerable effort has been put into MRV for REDD+ (FCPF Carbon Fund)</p>	<p>Base-line scenario reviewed and updated</p>	<p>Section 2 (F) on Current Baseline (Business-as-Usual Scenario)/Future Scenarios without the Project; paras 86 ? 91.</p>
<p>3. Chapter G Sustainability: The section does not explain how continuous operations of the EarthRanger System are ensured beyond the lifetime of the project (quantify operational budget necessary).</p>	<p>Text has been reviewed and updated to provide system maintenance by the countries to ensure sustainability.</p>	<p>Section 3(G) on Sustainability; Para 172-173.</p>
<b>USA</b>		
<p>1. Earth Ranger is often emphasized as a tool to direct real-time ranger effort in response to acute threats ? but given that many of the threats to the protected areas described here are also longer term (e.g., climate change, encroachment, fragmentation), we would encourage the implementers to leverage Earth Ranger?s integrated data collection &amp; management capabilities to support longer term applied conservation research and action ? to shape PA management beyond responding to immediate threats.</p>	<p>The text has been reviewed and updated with the application of the EarthRanger technology highlighted and linkages with other initiatives. Additionally capacity building under output 1.1.6 on the use of EarthRanger technology and adoption of standard operating procedures as well as collection of data on various aspects of PA management will shape future PA management.</p>	<p>Section 2 (F) - Paragraphs 89? 91 and Section 3 (A) Para 118</p>
<p>2. The ?control centers? required to operate an integrated Earth Ranger system seem to require hefty technology infrastructures. What are the baseline levels of functionality/infrastructure that PAs must have in place to use Earth Ranger? How much training does it take to train rangers or other protected area officials in these tools and the hardware maintenance /troubleshooting? Is capacity being built so that park officials can use this platform independently, or will they need sustained assistance from Vulcan/CI?</p>	<p>The basic requirements have been outlined under the criteria for selecting the PAs for project intervention. Further detailed site-level assessments to determine the Earth Ranger requirement of the 6 parks will be undertaken during project inception. The 6 sites will be further assessed by AI2 to confirm the specific infrastructure requirements, staffing levels, and training needs, to enable effective deployment of the EarthRanger technology.</p>	<p>Section 3 (D) Paras 157</p>

**ANNEX C: Status of Utilization of Project Preparation Grant (PPG).**  
**(Provide detailed funding amount of the PPG activities financing status**  
**in the table below:**

PPG Grant Approved at PIF: \$69,705			
Project Preparation Activities Implemented	GETF/LDCF/SCCF Amount (\$) 69,705		
	Budgeted Amount	Amount Spent To date	Amount Committed
During PPG Phase, the following activities were conducted: stakeholder mapping and engagement; Preparation of the ProDoc and budget; Filling the METT Tool; Desk studies including policy analysis baseline assessment, socio-economic assessment; and the Preparation of safeguards plans (Limited ESIA/ESMP, GMP, SEP, AGM);	69,705	48,816	20,889
<b>Total</b>	<b>69,705</b>	<b>48,816</b>	<b>20,889</b>

**ANNEX D: Project Map(s) and Coordinates**

Please attach the geographical location of the project area, if possible.



## ANNEX E: Project Budget Table

Please attach a project budget table.

Expenditure Category	Detailed Description	Component (USDeq.)					Total (USDeq.)	Responsible Entity <a href="#">(Executing Entity receiving funds from the GEF Agency)</a> <sup>1</sup>
		Component 1	Component 2	Sub-Total	M&E	PMC		
		Outcome 1.1	Outcome 2.1					
Personnel and Professional Services	Staff-Deputy Regional Program Manager	39,721	27,579	67,300	4,630	37,479	109,409	CI-African Field Division
	Staff- Technical Lead/Wildlife Conservation Technology Expert	15,517	16,683	32,200	2,525	19,611	54,336	
	Staff- Safeguards Lead	17,813	17,707	35,519			35,519	
	Staff-Finance and Grants Lead <sup>1</sup>	15,724	14,364	30,088	14,793	26,704	71,586	
	International Consultant - Terminal Evaluation			-	24,310		24,310	
	International Consultant - Mid Term Evaluation			-	20,500		20,500	
	Contractual Services - Translation for Conferences and Workshops	15,000	15,000	30,000			30,000	
	Contractual Services - Annual GEF Audit			-		10,775	10,775	
	Contractual- Gender Assessment	2,500	2,500	5,000			5,000	
			-			-		
Travel, Meetings and Workshops	Travel- Partner Financial monitoring			-		9,370	9,370	CI-Africa Field Division
	Regional Women's Ranger workshop	20,080		20,080			20,080	
	Regional earth ranger conference -Congo		4,880	4,880			4,880	
	Regional earth ranger conference -Bostwana		4,524	4,524			4,524	
	Regional earth ranger conference -Mozambique		5,306	5,306			5,306	
	EarthRanger Conference		9,881	9,881			9,881	
	Earth Rangers annual conference		30,518	30,518			30,518	
				-			-	
				-			-	
Grants and Agreements	Earth Rangers Installation and Training-Zinave Mozambique - Peace Parks Foundation	186,805	16,378	203,183	4,377		207,560	Third party grantees via CI-Africa Field Division
	Earth Rangers Installation and Training Republic of Congo -Odzala-Kokoua - African Parks	204,143	26,019	230,162	5,745		235,907	
	Earth Rangers Installation and Training Republic of Congo -Nouabalé-Ndoki - Wildlife Conservation Society	195,868	26,019	221,887	5,745		227,632	
	Earth Rangers Installation and Training Republic of Congo -Conkouati-Douli - Noe	174,648	24,380	199,028	4,104		203,132	
	Earth Rangers Installation and Training Botswana-Chobe National Park	485,243	52,983	538,226	11,067		549,293	
	Earth Rangers Installation and Training Mozambique-Limpopo - Peace Parks Foundation	463,058	27,035	490,092	6,759		496,851	
				-			-	
Equipment	Staff-Laptop New hire	625	625	1,250	625	625	2,500	CI-Africa Field Division
				-			-	
	Rent and Operations <sup>2</sup>	10,762	9,000	19,762	3,662	9,671	33,096	
	Inception workshop internet costs <sup>3</sup>			-	2,500		2,500	
Other Operating Cost	Final workshop Internet costs			-	2,894		2,894	CI-Africa Field Division
				-			-	
			-				-	
<b>Grand Total</b>		1,847,506	331,382	2,178,888	114,236	114,236	2,407,360	

<sup>1</sup>Finance and Grants Lead contributes to technical outputs through capacity building of the technical staff and the grantees to comply with GEF

<sup>2</sup>Rent and Operations or Country office support costs are costs such as office rent, utilities, office supplies, certain office equipment, and support staff

<sup>3</sup>Internet cost are communication costs for participants attending virtual meetings such as the inception and final workshops remotely if travel will not be feasible.

**ANNEX F: (For NGI only) Termsheet**

Instructions. Please submit a finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

**ANNEX G: (For NGI only) Reflows**

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

**ANNEX H: (For NGI only) Agency Capacity to generate reflows**

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).