

Funding Proposal

FP158: Ecosystem-Based Adaptation and Mitigation in Botswana's Communal Rangelands

Botswana | Conservation International Foundation (CI) | Decision B.28/04

6 April 2021



**GREEN
CLIMATE
FUND**

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Note to Accredited Entities on the use of the funding proposal template

- Accredited Entities should provide summary information in the proposal with cross-reference to annexes such as feasibility studies, gender action plan, term sheet, etc.
- Accredited Entities should ensure that annexes provided are consistent with the details provided in the funding proposal. Updates to the funding proposal and/or annexes must be reflected in all relevant documents.
- The total number of pages for the funding proposal (excluding annexes) **should not exceed 60**. Proposals exceeding the prescribed length will not be assessed within the usual service standard time.
- The recommended font is Arial, size 11.
- Under the [GCF Information Disclosure Policy](#), Project and programme funding proposals will be disclosed on the GCF website, simultaneous with the submission to the Board, subject to the redaction of any information that may not be disclosed pursuant to the IDP. Accredited Entities are asked to fill out information on disclosure in section G.4.

Please submit the completed proposal to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

“FP-[Accredited Entity Short Name]-[Country/Region]-[Dates]”

Acronyms:

AE	Accredited Entity
AFD	<i>Agence Française de Développement</i> (“French Development Agency”)
AFOLU	Agriculture, Forest, and Other Land Use
AMA	Accreditation Master Agreement
ASSAR	Adaptation at Scale Botswana Programme
BAITS	Botswana Animal Identification and Livestock Traceability System
BMC	Botswana Meat Commission
BUAN	Botswana’s University of Agriculture and Natural Resources
CBNRM	Community-Based Natural Resources Management
CBT	Commodity Based Trade
CCVA	Climate Change Vulnerability Assessment
CEDA	Citizen Enterprise Development Agency
CICE	Centre for In-Service and Continued Education
DAP	Department of Animal Production
DAR	Farmer Training, Department of Agricultural Research
DDC	District Development Committee
DFRR	Department of Forestry and Range Resources
DVS	Department of Veterinary Services
EbA	Ecosystem-based Adaptation
EDC	Enterprise Development Committee
EE	Executing Entity
ERP	Enterprise Resource Planning
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FAO	Food and Agriculture Administration of the United Nations
FEA	Financial and Economic Analysis
FFT _s	Farmer Facilitation Teams
FMD	Foot and Mouth Disease
FPIC	Free Prior Informed Consent
GAP	Gender Action Plan
GDP	Gross Domestic Product
GDSA	Gaborone Declaration for Sustainability in Africa
H4H	Herding for Health
ICT	Information and Communication Technologies
IE	Impact Evaluation
IPCC	The United Nations Intergovernmental Panel on Climate Change
LEA	Local Enterprise Authority
LIMID	Livestock Management and Infrastructure Development



LUCIS	Land-use Conflict Information System
M&E	Monitoring and Evaluation
MET	Department of Meteorological Services
MENT	Ministry of Environment, Natural Resources Conservation and Tourism
MNP	Meat Naturally Pty
MoA	Ministry of Agricultural Development and Food Security
NASA	United States National Aeronautics and Space Administration
NDA	National Designated Authority
NDC	National Determined Contribution
NDP	National Development Plans
NPGAD	National Policy on Gender and Development
NSO	National Strategy Office
OIE	World Organization for Animal Health
PMU	Project Management Unit
PSC	Project Steering Committee
RDC	Rural Development Council
RECC	Rural Extension Coordination Committee
RSA	Rangeland Stewardship Agreement
SADC	Southern African Development Community
SMME	Small, Medium, and Micro-Enterprises
TNC	Botswana's Third National Communication
VDCs	Village Development Committees
WIMS	Water Information Management System

A. PROJECT/PROGRAMME SUMMARY			
A.1. Project or programme	Project	A.2. Public or private sector	Public
A.3. Request for Proposals (RFP)	Not applicable		
A.4. Result area(s)	<p>Check the applicable GCF result area(s) that the <i>overall</i> proposed Project/programme targets. For each checked result area(s), indicate the estimated percentage of <i>GCF budget</i> devoted to it. The total of the percentages when summed should be 100%.</p>		
	<p>Mitigation: Reduced emissions from:</p> <p><input type="checkbox"/> Energy access and power generation:</p> <p><input type="checkbox"/> Low-emission transport:</p> <p><input type="checkbox"/> Buildings, cities, industries and appliances:</p> <p><input checked="" type="checkbox"/> Forestry and land use:</p> <p>Adaptation: Increased resilience of:</p> <p><input checked="" type="checkbox"/> Most vulnerable people, communities and regions:</p> <p><input type="checkbox"/> Health and well-being, and food and water security:</p> <p><input type="checkbox"/> Infrastructure and built environment:</p> <p><input checked="" type="checkbox"/> Ecosystem and ecosystem services:</p>	<p>GCF contribution:</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p>30%</p> <p>40%</p> <p><u>Enter number</u>%</p> <p><u>Enter number</u>%</p> <p>30%</p>	
A.5. Expected mitigation impact	21.5Mt CO ₂ e over 20 years	A.6. Expected adaptation impact	247,000 ¹ direct (54% women) and 2,290,000 ² indirect
			Of national population: 10% Direct, 100% Indirect
A.7. Total financing (GCF + co-finance)	\$97.6 Million USD	A.9. Project size	Medium (Upto USD 250 million)
A.8. Total GCF funding requested	\$36.8 Million USD		
A.10. Financial instrument(s) requested for the GCF funding	<p>Mark all that apply and provide total amounts. The sum of all total amounts should be consistent with A.8.</p>		
	<input checked="" type="checkbox"/> Grant \$36.8 million USD <input type="checkbox"/> Loan <u>Enter number</u> <input type="checkbox"/> Guarantee <u>Enter number</u>	<input type="checkbox"/> Equity <u>Enter number</u> <input type="checkbox"/> Results-based payment <u>Enter number</u>	
A.11. Implementation period	8.5 years	A.12. Total lifespan	20 years+
A.13. Expected date of AE internal approval	2/11/2021	A.14. ESS category	B
A.15. Has this FP been submitted as a CN before?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has Readiness or PPF support been used to prepare this FP?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

A.17. Is this FP included in the entity work programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.18. Is this FP included in the country programme?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
A.19. Complementarity and coherence	<i>Does the Project/programme complement other climate finance funding (e.g. GEF, AF, CIF, etc.)? If yes, please elaborate in section B.1.</i> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
A.20. Executing Entity information	<i>Conservation International, acting through its Botswana country office</i>		
A.21. Executive summary			

Context and Rationale:

Addressing the accelerating degradation of rangeland ecosystems is the most urgent climate change priority for the people of Botswana. More than 70% of household income in the country's rural areas comes from farming, which in Botswana refers primarily to the traditional, communal production of livestock. The people of Botswana have reared cattle on the country's rangelands for more than a thousand years, and this culturally and economically critical activity is under existential threat from the impacts of climate change. As climate stresses increase, pressures on geographic areas designated for wildlife and tourism which make up over 12% of the country's economy increase, creating a cascade of negative economic impact and vulnerability for the country, particularly in rural geographies.

The Government of Botswana recognizes the reliance of its population on rangelands, and through this GCF Project, seeks a transformational change in the way its rangelands are managed to sustainably support the socioeconomic well-being and climate resilience of its people, increase the health of its ecosystems, and to reduce national GHG emissions³.

Botswana's rangelands and the people dependent on these ecosystems for their livelihoods are extremely vulnerable to current and projected changes in climate. Climate change and poor management of rangelands are already causing serious losses of livestock assets, and further climate impacts may trigger a collapse into chronic poverty for rural populations. While there has always been natural variation in the occurrence of drought and severe storms, anthropogenic climate change has led to the intensity of droughts increasing by 85% and extreme precipitation events by 18% since 1980⁴. 2019 was the hottest year on record for Botswana with the worst drought in decades, Lake Ngami dried completely for the first time in nearly 40 years, and thousands of families lost livestock due to heat stress and starvation.

Climate model projections show that higher temperatures, longer dry seasons, and increased frequency of drought and fire are all expected in the future and will increase rangeland degradation and associated sequestration potential, exacerbate populations' vulnerability, and increase exposure to extreme events. There is a critical need for new models of livestock husbandry and rangelands management systems that work at broad spatial scales to restore Botswana's

¹ Estimated 80% of the population of the 3 project areas as direct beneficiaries of project interventions, and through enhanced policy and improved national strategies and systems for climate mitigation and adaptation affecting the entire Botswana population.

² StatsBotswana 2020 population estimate (<http://www.statsbots.org.bw>)

³ See Annex 2, Section 1, Appendices 1.2 and 1.3 – Botswana draft GCF Country Programme and Key Priority areas for climate finance.

⁴ SPEI dataset (2020) <https://spei.csic.es/database.html>

degraded lands and empower the rural population to implement ecosystem regeneration and climate-resilient livestock production to optimally respond to climate change risks and mitigate greenhouse gas (GHG) emissions.

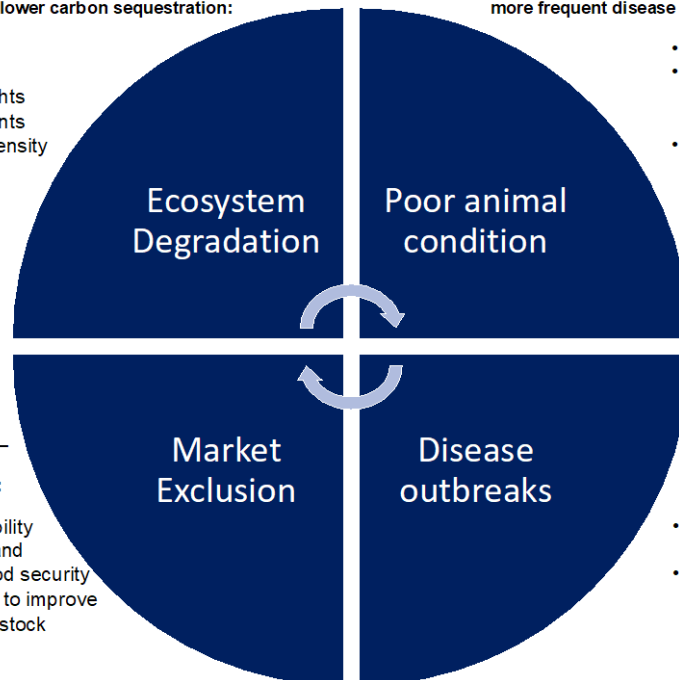
As depicted in Figure 1, increasing temperatures and changing rainfall patterns are contributing to ecosystem degradation, poor animal condition, disease outbreaks, and market exclusion – creating a vicious cycle of degradation, increased livestock emissions, reduced habitat sequestration potential, and reduced livelihoods for the most vulnerable populations in Botswana living in last-mile communities. The climate-induced degradation of ecosystems also drives increased wildlife poaching, encroachment into conservation areas by cattle which affects natural wildlife movements, and increased trapping, poisoning, and hunting of predators that negatively affect biodiversity and extend threats to ecotourism activities in the country. This cycle must be broken through a paradigm shift to collective management of natural rangeland resources, implemented in a context-driven, gender responsive way that reflects the needs and capacities of all stakeholders. This paradigm shift is critical for people and nature in Botswana and throughout Africa.

Climate change effects that exacerbate rangeland degradation – leading to worse animal condition and lower carbon sequestration:

- Temperature increase
- Evaporation increase
- Extended dry season / droughts
- Increased severe rainfall events
- Increased fire frequency / intensity

Climate change effects that worsen animal condition – leading to more frequent disease outbreaks and higher enteric emissions

- Max temperature increase
- Doubling of days per year > 30 degrees by 2050 when cattle are unable to absorb nutrition
- Increased animal energy expenditure while searching for food



Cumulative impacts of climate change – leading to lower adaptive capacity and continuation of poor grazing practices:

- Increased livelihood vulnerability
- Increased wildlife poaching and bushmeat for income and food security
- No markets reduce incentive to improve management or invest in livestock health

Climate change effects that increase disease outbreaks leading to market closure for communal farmers:

- Higher temperatures are more suitable for disease vectors
- Increased interactions between livestock, wildlife, and humans in search of land and water resources

Figure 1: Climate change impacts create a cycle of ecosystem degradation and vulnerability in the communal rangelands of Botswana

Proposed Approach:

The Project interventions are designed to significantly increase the adaptive capacity of the people of Botswana to respond to the negative impacts of climate change in the country's communal

lands. The Project will exclusively service "last-mile communities" who farm on non-tenured Village Grazing Areas⁵ and achieve its objectives through activities holistically designed to:

- 1) Strengthen institutions and support systems for climate-responsive planning and management in communal rangelands;
- 2) Reduce emissions and negative livelihood impacts through rangeland rehabilitation and improved livestock management;
- 3) Sustain enhanced adaptive capacity and low-emissions development through value-chain and policy transformation.

The Project will be implemented in three target areas of Botswana: Ngamiland (northwest), Kgalagadi (southwest), and Bobirwa (east central). The three areas were prioritised for GCF Project intervention by national stakeholders in 2016 due to their high climate vulnerability. Collectively, the areas cover 41.3% (~240,000 km²) of the country and have an average population density of 2.6 people/km². In the communal lands of the three areas, poverty levels exceed 50%⁶, with socio-economic conditions largely attributed to the effects of drought on traditional agriculture, limited alternative economic opportunities in rural areas, and lack of access to formal markets.⁷ Although similar socio-economic characteristics of the three areas allows for similar policy and institutional development approach, the carbon sequestration benefits will differ across the three ecosystems, with Ngamiland generating the largest returns per hectare, followed closely by Bobirwa, as a result of differences in vegetation cover, soils present, and regional herd size.

⁵ In Botswana, private and group ranches that supply the commercial beef sector occupy lands close to road and market infrastructure in urban areas and away from wildlife management areas due to conflicts and trade barriers. Communal rangelands that are the target of the project are in more remote areas, often adjacent to wildlife areas but excluded from high-value lands, such as areas closer to the Okavango Delta, where tourism concessions are granted to private operators.

⁶ Statistics Botswana (2015) & Mapping Poverty in Botswana 2010, World Bank Poverty Global Practice Africa Region.

⁷ Botswana National Atlas, 2019 page 11

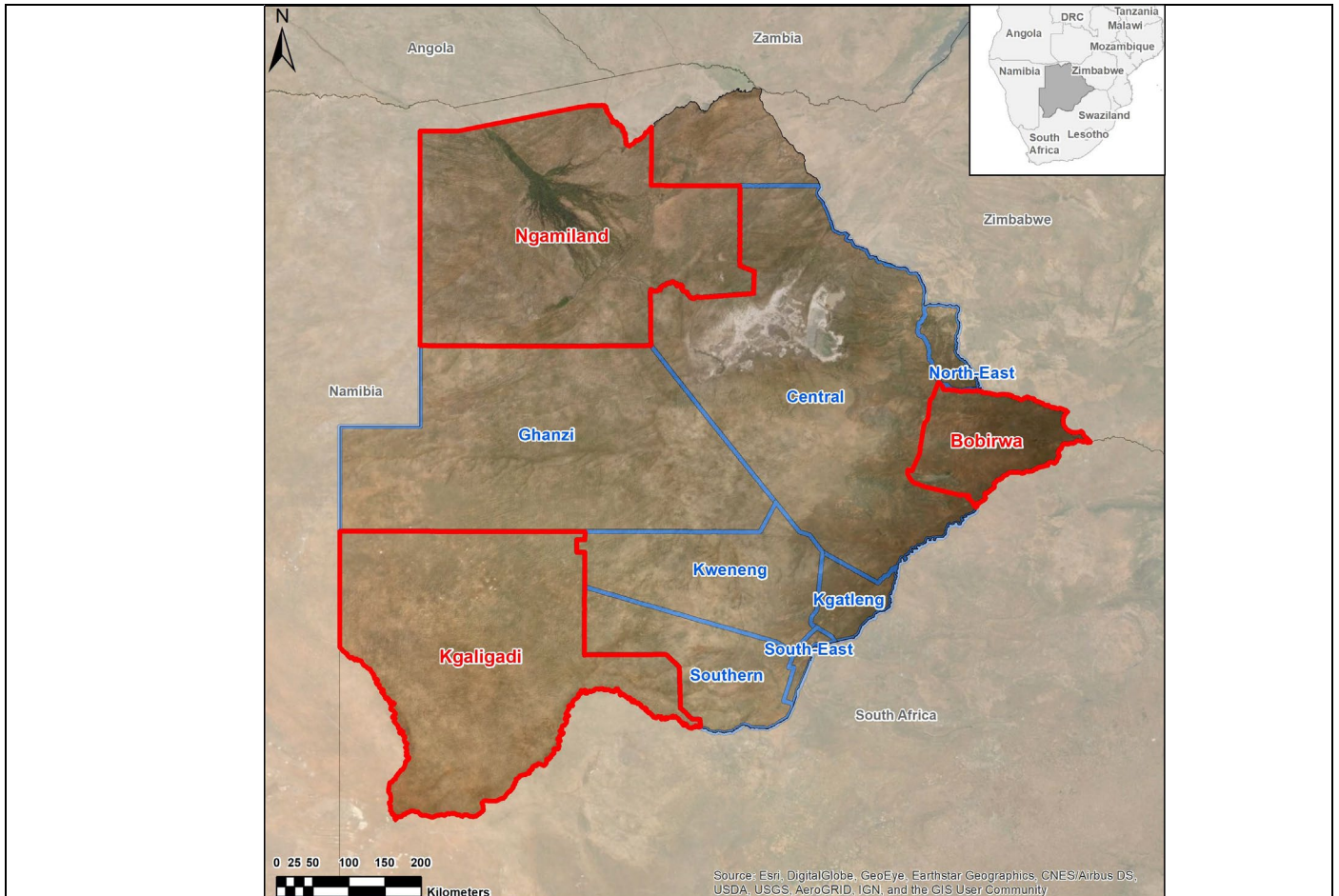


Figure 2. Project Target Areas (red borders)

CI, with the extensive support of farming communities, the Government of Botswana, civil society organizations, and NGOs will replicate and scale the demonstrated success of the Herding For Health (H4H) model of communal rangelands management that was pioneered in South Africa by Conservation International and its partners. All Project activities are designed to respect established Environmental and Social Safeguards (ESS) in compliance with CI's Environmental and Social Management Framework (ESMF).

There are three key elements to this model:

- Utilise donor funding and government job creation investments to scale capacity building and career development in professional herding and rangelands rehabilitation that draws on indigenous knowledge and practices.
- Work with communities, NGOs, and government agencies to develop communal grazing plans and improved veterinary services for traditional farmers' livestock. With planned, collective grazing and herd health overseen by professional herders, rangelands are allowed time to recover between grazing cycles, restoring degraded ecosystems that in turn provide improved fodder and soil organic carbon (SOC) sequestration, and reduce livestock-based GHG emissions.
- Work with government and private sector actors to create flexible but consistent access to markets that sustainably incentivise collective management, reward environmental

improvements, and increase adaptive capacity by enabling sale/offtake during times of climate stress.

The Project activities will also include the development and deployment of a Rangeland Stewardship Portal, through which data will be collected on ecosystem health, climatic conditions, cattle herd size and locations, fires, disease outbreaks, and economic returns from livestock sales by farmers. This Portal will allow open access to herders, communities, government, and organizations to inform their decision making and planning. The Portal will also contribute to an innovative, participatory Project Monitoring and Evaluation system wherein information flows both to and from Project beneficiaries. As part of the Project M&E system, an innovative Impact Evaluation will be undertaken to better determine project-attributable change by comparing targeted areas with similar control areas in Botswana.

The Project approaches emphasize the importance of collective planning and action that respects the indigenous knowledge and self-determination of its beneficiaries. By working directly with communities to build governance and technical capacity to coordinate their grazing and livestock activities, these communities will be empowered to increase the value of their existing stock; reduce risks from disease, theft, wildlife conflict, and predation; and conserve the natural resources that sustain their way of life. Involvement of relevant officials and policy engagements will ensure alignment of support and embedding of new approaches to climate-resilient land and livestock management. The Project will also create opportunities for Botswana's pastoralists, community leaders, and local government officials to understand the threats from climate change and how their communities can contribute to the mitigation of GHG emissions through improved rangelands management.

The sustainability of interventions is considered by the Project at all levels. Addressing the demand side of the market is critical to this effort. CI and Project partners will work with the private sector and government to increase the value of livestock produced and bring market access to the communities rather than farmers being dependent on intermediaries or forced to travel long distances to sell their livestock assets, an intervention that is particularly important during times of climate stress when livestock are unable to travel long distances and often die from lack of food and water. Awareness raising, market readiness training, facilitating offtake arrangements, and creating financial assistance and operational protocols for private sector and consumer shifts to low-emissions, climate-smart meat products will also contribute to the long-term success of the Project.

The Government of Botswana (GoB) and stakeholders at all levels have been engaged throughout Project development and are very supportive of the Project approach. The government has committed \$54 million in co-finance to the Project to fund the training and deployment of Ecorangers and associated personnel through the government's *Ipelegeng* wages-for-public works program. This contribution represents nearly 60% of the total Project costs and is critical to the Project's Theory of Change. The GoB's investment will create the human resource capacity required for the successful delivery of the Project's adaption and mitigation impacts. Botswana's Ministry of Agricultural Development and Food Security (MoA) will lead government coordination of the Project and will convene a Project steering committee that includes representatives of the Ministries of Local Government, Environment, and Trade and Industry, Lands, Water and Sanitation, and Gender Affairs. This level of government engagement and support is critical to the success of the Project and will support the ability of the government to align climate response strategies in communal rangelands and replicate successful Project

coordination structures and interventions in other regions of the country. Private sector partners have also been extensively engaged to design strategies and policy reforms to unlock market access for communal farmers and to be able to purchase from the Project's farming communities.

Project Impacts:

The Project approaches will simultaneously reduce degradation of Botswana's rangelands while improving the condition of livestock to increase the resilience of Botswana's most vulnerable populations and the local economies where they live. The Project activities will also result in significant emissions reductions by increasing the carbon sequestration potential of the landscape and by reducing enteric emissions from livestock through improved management and fodder. Finally, the Project will generate significant co-benefits for biodiversity, ecosystem health, water conservation, and overcoming barriers to move towards an inclusive and diversified climate-resilient economy for Botswana.

Over the 8.5-year implementation period, the Project is expected to directly increase the climate change resilience of 247,000 people (80% of the Project area population, see Table 1) and improve the management of 46,000 km² of natural ecosystems at a cost efficiency of ~\$8.00 per hectare.

Table 1: Beneficiary populations within the Project areas

Project area	Livestock production beneficiaries		Economic impact beneficiaries		Total beneficiaries within project area		Total population within project area	
	Number	% of total pop.	Number	% of total pop.	Number	% of total pop.	Number	% of total pop.
Bobirwa	36,009	48%	14,457	19%	50,466	67%	75,018	100%
Kgalagadi	28,162	48%	11,307	19%	39,469	67%	58,671	100%
Ngamiland	112,333	64%	45,100	26%	157,433	90%	175,520	100%
Areas combined	176,504	57%	70,864	23%	247,367	80%	309,209	100%

Through improved livestock management and increased capacity of beneficiaries to offtake during drought, the Project will significantly reduce loss of livestock assets of the rural poor, based on results from Herding for Health (H4H) pilot activities in South Africa and Botswana, and elsewhere in Africa^{8,9}. Notably, emissions reductions during Project implementation (4.7 MtCO₂e) from improvements to livestock management and restoring ecosystems in the target landscapes will contribute more than 45% of Botswana's National Determined Contribution (NDC) to mitigating global impacts of climate change which targets a reduction of national emissions to 15% below the country's 2010 baseline. Over the course of its 20-year lifespan, emissions reductions resulting from the Project are projected to be ~21.5 Mt CO₂e. The below table presents the distribution of Project staff, secondments, *Ipelegeng* employees and Project impacts across the three target Districts.

⁸ Food and Agriculture Organization (FAO). 2018. Horn of Africa: Impact of Early Warning Early Action. UN Food and Agricultural Organisation

⁹ See Annex 2 – Feasibility Study – Section 2 - Financial and Economic Analysis & Feasibility Study Appendix 4.4

District:	Bobirwa	Kgalagadi	Ngamiland
Project Sites:	2 clusters, 15 Village Areas	3 clusters, 34 Village Areas	4 clusters, 55 Village Areas
CI Project Staff (all phases)	9	12	13
Secondments (all phases)	6	6	6
Ipelegeng Employees (all phases, estimated): Trained, Supervised, and Managed	1000	1800	3200
Direct Beneficiaries	50,466	39,469	157,433
Emissions Reductions – 20 years	3 MtCO ₂ e	7 MtCO ₂ e	11 MtCO ₂ e

The Project has the long-term potential to indirectly increase the climate change resilience of the entire national population of Botswana (~2.3M people) and improve the condition of 175,038 km² of natural ecosystems and associated mitigation impacts. The Project will do this through the development of climate change tools, increasing the availability of climate and rangeland data, support for national policy development including Commodity Based Trade (CBT) reforms, and the enhancement of existing government programmes and value-chains that support sectors including agriculture and tourism.

GCF investment in this Project is critical to catalyze the coordination and capacity building of the people and Government of Botswana to address the impacts of climate change. The models and data developed through this project will influence government policy, create innovation in the way that *Ipelegeng* funds are deployed, and farmers will see first-hand the value in creating well managed landscapes for generations to come.

B. PROJECT/PROGRAMME INFORMATION

B.1. Climate rationale and context

Baseline and Current Impacts

1. The United Nations Intergovernmental Panel on Climate Change (IPCC) observed that increased temperature, increased temporal and spatial variation in precipitation, and more frequent climatic disasters are taking place across Africa, particularly where oceanic moderating effects are less¹⁰. Southern Africa is highly vulnerable to climate change¹¹ and Botswana as an inland, dryland country within Southern Africa is especially exposed to climatic risks¹². According to the ND-GAIN index, Botswana is the 67th most vulnerable country globally, and the 84th most ready to respond, which shows that while Botswana has capacity to adapt, national adaptation needs are profound and urgent action is required¹³.
2. Botswana is currently experiencing significant impacts from anthropogenic climate change¹⁴. Average temperatures have risen by more than 1 degree Celsius above pre-industrial levels¹⁵, drought frequency has increased significantly (see Figure 4), severity has intensified by ~85% since 1980, and precipitation has become more variable with longer dry seasons and heavier rainfall - resulting in an 18% increase in the severity of extreme precipitation events since 1980¹⁶. Botswana's greatest exposure to climate risks comes from the impacts of intensified and more frequent heatwaves, droughts, and increased risk of flooding.
3. Over the last 66 years in Botswana, 21 years (or 32%) were classified as abnormally, moderately, severely, extremely, or exceptionally dry. Seventeen years (25%) over this period were classified as wetter than normal. From 1980 to present, 43% of years have been classified as dry compared to 14% being wetter and 43% being near normal. From the 1950s to present, the ratio of wet to dry years is 1:1.24. However, from 1980 to present, the ratio is 1 wet year for every 3.06 dry years. Furthermore, in the full record (66 years) there have been 43 months classified as Severely, Extremely or Exceptionally Dry, with 31 of those (72%) occurring between 2010 to 2019¹⁷.

¹⁰ Ning, I., O.C. Ruppel, M.A. Abdrabo, A. Essel, C. Lennard, J. Padgham, and P. Urquhart, 2014: Africa. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1199-1265.

¹¹ Niang, I., O.C. Ruppel, M.A. Abdrabo, A. Essel, C. Lennard, J. Padgham, and P. Urquhart, 2014: Africa. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Barros, V.R., C.B. Field, D.J. Dokken, M.D. Mastrandrea, K.J. Mach, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1199-1265

¹² Botswana INDC

¹³ <https://gain-new.crc.nd.edu/country/botswana>

¹⁴ See Annex 2, Section 1 for detailed Climate Change Vulnerability Assessment (CCVA) and Appendix 1.5 for validation of the downscaled GCMs used to quantify local climate change and projections.

¹⁵ Hulme, Mike & RM, Doherty & Ngara, T.N.M. & New, Mark & Lister, David. (2001). African Climate Change: 1900-2100. CLIMATE RESEARCH. 17. 145-168. 10.3354/cr017145.

¹⁶ SPEI dataset 2020

¹⁷ SPEI dataset 2020

4. An investigation of the effects of El Niño–Southern Oscillation (ENSO) trends shows strong correlation between ENSO and the climate of Botswana. Rainfall decreases and temperature increases in El Niño years and vice versa in La Niña years. Over the 116 years of data, 60 years are classified as + ENSO (El Niño), and 56 as - ENSO (La Niña)¹⁸. Of the El Niño years, ~61% more years show a decrease in precipitation than an increase (37:23). The years are ~27mm drier than normal years and ~21% drier than El Niño years that do show an increase in precipitation. The La Niña years saw ~7% more wet years than dry (29:27). However, these wetter years are ~33mm wetter than normal, and ~78% wetter than the La Niña that do have a decrease in the precipitation. There is also a strong positive correlation between temperature¹⁹ and the ENSO phase. El Niño phase sees 47 out of 60 years showing higher temperatures (~0.28°C). Conversely La Niña years are cooler in 41 of 56 years by ~0.32°C. Ngamiland (Average of 703 mm/year) has the highest sensitivity to the ENSO phase with the largest inverse correlations (~80mm per year) to ENSO in 1950, 1970, and 1990. Kgalagadi also shows a large inverse correlation to the ENSO phase (see 1970, 1980 and 2010), however, with the low precipitation climatology (Average of 474 mm/year) this is likely more significant on the ground.

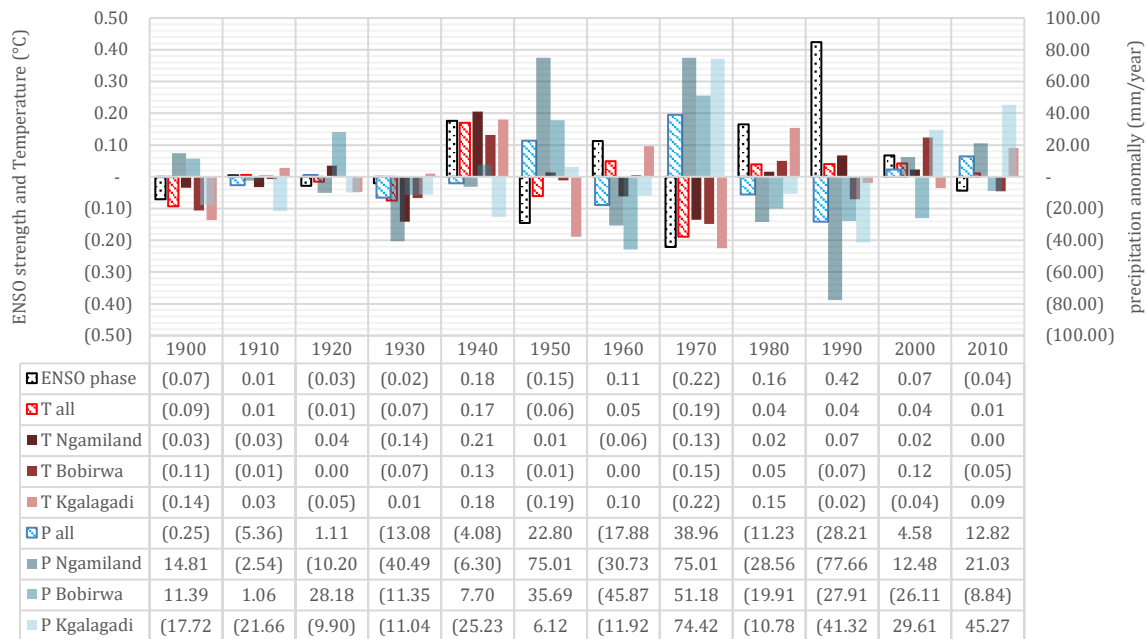


Figure 3. Decadal average temperature* (T) and precipitation (P) compared to the Bivariate ENSO Timeseries average for each of the Project sites

5. Seventy-three per cent (73%) of Botswana’s total land area of 572,000 km² is covered by arid and semi-arid rangelands grazed by both livestock and wild animals. Communal livestock production is the dominant land use across these rangelands and contributes socio-economically to ~70% of rural livelihoods^{20, 21} and the importance of communal livestock production in provisioning food, income and risk assurance to Botswana’s rural poor is well documented²². The current degradation of Botswana’s communal rangelands

¹⁸ The Neutral years are categories as either El Niño or La Niña to remove any selection bias

¹⁹ When climate change signal is removed though removing the 20-year running average

²⁰ World Bank 2019. Botswana Country Profile.

²¹ Government of Botswana. 2012. Agriculture and Food Security Policy Brief: Reflecting on the challenges of attaining a Green Economy for Botswana.

²² See Annex 6. Environmental and Social Assessment and Management Plan

reduces the population's capacity to maintain their livelihoods in the face of climate change²³. In addition to supporting livelihoods, livestock plays a central role in the cultural practices of the Batswana people²⁴. Approximately 85% of Botswana's agricultural output is derived from livestock production²⁵ and beef is the only net positive agricultural export for the country. Animals in the traditional livestock system account for ~90% of the total national herd. As a result, Botswana's beef production depends strongly on the success of communal livestock producers²⁶. This dual role of livestock as a social safety net and economic driver is reflected in Botswana's current policies and programmes that aim to expand the economic productivity of the national herd.

6. The impacts of recent drought intensity and frequency are threatening livelihood activities and increasing pressure on livestock and wildlife populations. Recent drought events in Botswana have affected ~1.3 million people^{27,28} and caused ~US\$47 million in damages²⁹. Among other factors, droughts and fires, particularly in communal rangelands, are increasing concentrations of domestic and wild animals around water sources, resulting in increased human-wildlife conflict and competition for water. Droughts and fires also lead to a decrease in vegetation cover and subsequent desertification of rangeland ecosystems, with evidence from satellite imagery confirming this has occurred and has been accelerating since at least the mid-1980s³⁰. The mobility of animals driven by their search for water has decreased livestock and wildlife conditions³¹ and increased disease outbreaks that, in turn, lead to market exclusion (Foot and Mouth Disease (FMD) in particular) and resultant loss of income for livestock producers.³²

²³ Liniger, HP. and Mekdaschi Studer, R. 2019. Sustainable rangeland management in Sub-Saharan Africa – Guidelines to good practice. TerrAfrica; World Bank, Washington D.C.; World Overview of Conservation Approaches and Technologies(WOCAT); World Bank Group (WBG), Washington DC, USA and Centre for Development and Environment (CDE), University of Bern, Switzerland.

²⁴ See Annex 6. Environmental and Social Assessment and Management Plan

²⁵ United States Department of Agriculture Foreign Agricultural Service, 2015. Botswana: Agricultural Economic Fact Sheet.

²⁶ See Annex 2: Feasibility Study, Section 5. Market Assessment and Sustainability Plan

²⁷ Juana, J., et al. (2014). "Socioeconomic Impact of Drought in Botswana." *International Journal of Environment and Sustainable Development*, 11(1).

²⁸ Mogotsi, K., et al. (2011). The perfect drought. Constraints limiting Kalahari agropastoral communities from coping and adapting. *African Journal of Environmental and Science Technology* 5.

²⁹ Masih, I., S. Maskey, F. E. F. Mussá, and P. Trambauer. 2014. "A Review of Droughts on The African Continent: A Geospatial and Long-Term Perspective". *Hydrology and Earth System Sciences* 18 (9).

³⁰ C. Vanderpost, S. Ringrose, D. Kgathi & W. Matheson (2007) The nature and possible causes of land cover change (1984 –1996) along a rainfall gradient in southeastern Botswana, *Geocarto International*, 22:3 See also Annex 2, Feasibility Study, Section 1 Country Profile and Climate Vulnerability Assessment

³¹ Abel, N.O.J., and P.M. Blaikie, 1990. Land degradation, stocking rates and conservation policies in the communal rangelands of Botswana and Zimbabwe. Pastoral Development Network Paper 29a (May 1990), Overseas Development, Institute, London; Perkins, Jeremy (1996), Botswana: Fencing Out the Equity Issues: Cattleposts and Cattle Ranching in the Kalahari Desert (*Journal of Arid Environments*, 33: 503 - 517); Cullis and Watson (2005)), Winners and losers: privatising the commons in Botswana, IIED, Hertfordshire; Doughill, Andrew J, Lawrence Akanyang, Jeremy S. Perkins, Frank D. Eckardt, Lindsay C. Stringer, Nicola Favretto, Julius Athlapheng and Kutlwano Mulale (2016), *Land use, rangeland degradation and ecological changes in the southern Kalahari, Botswana*. *African Journal of Ecology* 54, 59–67; Basupi et al (2017), *ibid.*; Darkoh, BK. and Joseph E Mbaiwa (2010), Land-use and Resource Conflicts in the Okavango Delta, Botswana. Harry Oppenheimer Okavango Research Centre, Maun.

³² Livestock feeding that required covering long distances leads to a decrease in weight with an average cow using more calories than it consumes >10 km traveling. This increases when fodder condition is poor, as in the case of drought, and grasses available are of low quality. Animals <300 kg are unlikely to be able to be sold, and farmers often end up losing such animals to starvation. See Annex 2, Section 5 for more detail.

Year	Impact Area
1961-1965	Drought year (North East, Central)
1968-1971	Non-drought years
1979-1980	Drought year (Bobirwa)
1981-1987	Drought years (Whole Country)
1991-1999	Drought years (Whole Country)
2001-2005	Drought years (Whole Country)
2007-2008	Drought year (Whole Country)
2008-2009	Non-drought year
2009-2010	Whole Country
2010-2011	Whole Country
2011-2012	Whole Country
2012-2013	Drought year (Whole Country)
2013-2014	Non-drought year
2014-2015	Drought year (Whole Country)
2015-2016	Drought year (Whole Country)
2016-2017	Drought year (Partial)

Source: Environment Statistics, Central Statistics Office 2000; Rural Development Council

Figure 4: All Official Drought Declarations in Botswana 1961 – 2017

7. An estimated 710,000 livestock units (approximately 36%) are affected annually by droughts in Botswana³³. For the rural poor, the effects can be disastrous and severe. Droughts in three of the last five years have led to significant livelihood issues in marginalized communities (often in communal lands), including loss of livestock, water scarcity, and malnutrition³⁴. In the poorest district of Botswana, Ngamiland, more than 40,000 cattle perished in 2019, representing approximately 20% of the total herd, devastating the livelihoods of thousands³⁵. Loss of livestock to predation also increases in times of drought as livestock weaken and travel into wildlife areas in search of fodder and water³⁶. And although research is still ongoing, there are likely knock-on effects of drought including increased human wildlife competition and interactions³⁷ including elephant and rhino poaching, bush-meat hunting, and over-harvesting of Mphane worms³⁸.

³³ CIMA, UNISDOR (2018) Botswana Disaster Risk Profile.

³⁴ FAO, September 2016. Southern Africa. Situation report. <http://www.fao.org/3/a-br082e.pdf>

³⁵ <https://www.voanews.com/africa/botswana-drought-makes-wasteland-harvests-livestock>

³⁶ Liniger, HP. and Mekdaschi Studer, R. 2019. Sustainable rangeland management in Sub-Saharan Africa – Guidelines to good practice. TerrAfrica; World Bank, Washington D.C.; World Overview of Conservation Approaches and Technologies(WOCAT); World Bank Group (WBG), Washington DC, USA and Centre for Development and Environment (CDE), University of Bern, Switzerland.

³⁷ See Annex 6 Environment and Social Assessment and Annex 8 Gender Assessment and Action Plan

³⁸ Mphane, or Mopane, is an emperor moth caterpillar and nutritious traditional food that is also increasing in value for regional export markets. Individuals knowledgeable in the trade noted an increase in number of individuals harvesting the worms after the 2015 and most recent 2019 drought. Mphane harvesting is a livelihood activity mostly carried out by women. There are large number of mphane harvesters in Botswana, especially in Bobirwa according to: IDRC, DFID and CARIAA. 2015. Vulnerability and Risk Assessment in Botswana's Bobirwa Sub-District: Fostering People-Centred Adaptation to Climate Change. Available at: http://www.assar.uct.ac.za/sites/default/files/image_tool/images/138/Botswana/ASSAR%20Botswana%20Vulnerability%20Risk%20Assessment.pdf



Figure 5: Key climate change impacts on communal livestock production and value-chains from heat and drought

8. The recorded increased intensity of rainfall events results in floods that negatively impact lives and the economy. Despite increasing temperatures and dry season duration, annual average precipitation in Botswana has not changed significantly. However, the frequency and severity of rainfall events are changing. Of the 11 major flood events recorded since 1972, eight have occurred since the year 2000³⁹. Based on consultations with local stakeholders, the observed larger rainfall events, concentrated in fewer months, cause flooding events which result in negative effects on livestock-based livelihoods (Figure 5). These impacts disproportionately affect women who are responsible for finding clean water and food after wells and gardens are destroyed⁴⁰.

³⁹ EM-DAT: The Emergency Events Database - *Universite catholique de Louvain* (UCL) - CRED, D. Guha-Sapir - www.emdat.be, Brussels, Belgium

⁴⁰ Annex 8. Gender Assessment and Action Plan.

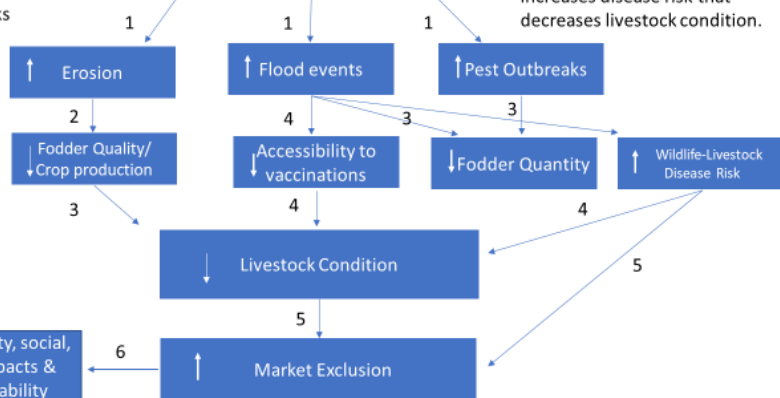
1 Climate change effects from increased Ghg emissions increases intensity of rainfall events which has expanded areas of erosion an increased frequencies of flood events and pest outbreaks

2,3 Erosion, floods, and associated insects more directly impact crop-based agriculture the women responsible for this activity. Depending on length of flood, it can affect livestock fodder, but generally rainfall increases natural fodder bank

Negative biodiversity, social, and economic impacts & increased vulnerability

6 Poverty drives gender-based violence, additions, and poaching which impacts tourism and ecosystem resilience

↑ Intensity of rainfall events



4. Floods can prevent farmers from getting animals to mandatory dipping and/or force them to graze in drier areas in wildlife areas. This increases disease risk that decreases livestock condition.

5 Poor livestock condition, disease outbreaks impact market access and viability

Figure 6. Climate change impacts on communal livestock production and value-chains from flooding events

9. The draft GCF Country Programme for Botswana recognizes that a critical lack of baseline climate data is one of the primary challenges that the country faces. Local and regional literature as well as primary analyses based on available data were used to mitigate data gaps for this assessment. Water availability varies considerably across Botswana⁴¹. Mean annual rainfall ranges from less than 250 mm in the southwest of the country to more than 650 mm in the northeast. Groundwater resources are estimated at 100 billion m³ and annual surface run-off at ~700 million m³/yr⁴². Official estimates of the rate of aquifer recharge differ between 96–1600 million m³/yr, depending on the source, with the most recent estimate from the Department of Water Affairs being on the lower end of this wide range⁴³. Most groundwater resources are, however, located in confined aquifer systems that were recharged under paleoclimatic conditions, referred to as fossil water, and do not experience modern recharge⁴⁴. The majority of surface run-off is unable to be captured in part because of insufficient storage, topography, high rates of evapotranspiration and high spatio-temporal variability of run-off^{45,46}. The surface water storage capacity of the country is recognized as one of the most limited in the region⁴⁷. This is further complicated by the fact that Botswana is heavily dependent on transboundary water sources, including groundwater aquifers and rivers⁴⁸. Surface water sources in the country, except for the Okavango Delta, experience periodic drying as a result of the spatiotemporal variation in water run-off, which is being exacerbated by climate change impacts⁴⁹. Despite ~90% of water supply in urban

⁴¹ See Section 1: Climate Vulnerability Assessment Report

⁴² Ministry of Environment Natural Resources Conservation and Tourism, "Botswana's Third National Communication to the United Nations Framework Convention on Climate Change."

⁴³ Ibid.

⁴⁴ Ministry of Environment Natural Resources Conservation and Tourism, "Botswana's Biennial Update Report (BUR) to the United Nations Framework Convention on Climate Change."

⁴⁵ Department of Water Affairs - Ministry of Minerals, "Botswana Integrated Water Resources Management & Water Efficiency Plan."

⁴⁶ Du Plessis and Rowntree, "Water Resources in Botswana with Particular Reference to the Savanna Regions."

⁴⁷ Ministry of Environment Natural Resources Conservation and Tourism, "Botswana's Third National Communication to the United Nations Framework Convention on Climate Change."

⁴⁸ Ministry of Environment Natural Resources Conservation and Tourism, "Botswana's Third National Communication to the United Nations Framework Convention on Climate Change."

⁴⁹ Ministry of Environment Natural Resources Conservation and Tourism, "Botswana's Biennial Update Report (BUR) to the United Nations Framework Convention on Climate Change."

areas coming from surface water, the majority (~65%) of Botswana's total water supply is sourced from groundwater⁵⁰. In addition to national water resources, Botswana receives an annual water quota of up to 7.3 million m³/yr from the Molatedi Dam in South Africa⁵¹. The water sources of greatest direct importance to the communal livestock sector are the Okavango Delta and groundwater aquifers.

- 10.** The Okavango Delta, a global RAMSAR and Natural World Heritage Site, and a critical source of water supply to key rangelands in private and community tourism concessions being impacted by climate change. Rainfall from the source of the Okavango Delta in Angola in 2018-2019 season was the lowest in the last 38 years, lower than the 1995-96 drought that resulted in an inflow that was the lowest on record^{52,53,54,55}. The total volume of water entering the Delta has decreased as well as the magnitude of the wet season pulse⁵⁶. This has implications for the surrounding vegetation and ecology, which varies in its structure and function depending on the extent, distribution, frequency and duration of inundation⁵⁷. Reduced flow into the Okavango delta is shown to increase wildlife dispersal into adjacent communal rangeland areas and cattleposts with artificial water points, increasing the number of conflicts between wildlife, humans, and livestock as these populations compete over water and grazing resources⁵⁸. The number of fire detections⁵⁹ and average fire brightness have also consistently increased in the Delta over the last decade. There is limited academic consensus on whether all observed changes can be fully attributed to climate change and there is speculation that many wildfires are set by encroaching farmers to stimulate regeneration of nutritious "green flush". In either case, direct or indirectly, climate change impacts on the characteristics of fire in the peatland-rich Delta system are increasing Botswana's emissions profile and warrant changes to management approaches that are integrated across communal-grazing-ecotourism landscapes⁶⁰.
- 11.** The direct impacts of anthropogenic increases in GHG emissions and associated warming are altering Botswana's communal rangeland ecosystems and affecting this ecosystem's mitigation potential⁶¹. Botswana's rangeland degradation is driven by expansion of bush encroachment, alien plant invasions, and bare ground. A reduction in the number of frost days due to climate change^{62,63} and increased atmospheric CO₂ is contributing to the

⁵⁰ Du Plessis and Rowntree, "Water Resources in Botswana with Particular Reference to the Savanna Regions."

⁵¹ WAVES - The World Bank, "Accounting for Water in Botswana," 2014.

⁵² Murray-Hudson, Wolski, and Ringrose, "Scenarios of the Impact of Local and Upstream Changes in Climate and Water Use on Hydro-Ecology in the Okavango Delta, Botswana."

⁵³ Hydrological Services Namibia Flood Bulletin (2019)

⁵⁴ Lotta Andersson et al., "Impact of Climate Change and Development Scenarios on Flow Patterns in the Okavango River," *Journal of Hydrology* 331, no. 1–2 (2006): 43–57, <https://doi.org/10.1016/j.jhydrol.2006.04.039>.

⁵⁵ Susan Ringrose, "Characterisation of Riparian Woodlands and Their Potential Water Loss in the Distal Okavango Delta, Botswana," *Applied Geography* 23, no. 4 (2003): 281–302, <https://doi.org/10.1016/j.apgeog.2003.08.006>.

⁵⁶ Okavango Delta Monitoring and forecasting <http://okavangodata.ub.bw/ori/>

⁵⁷ Michael Murray-Hudson, Piotr Wolski, and Susan Ringrose, "Scenarios of the Impact of Local and Upstream Changes in Climate and Water Use on Hydro-Ecology in the Okavango Delta, Botswana," *Journal of Hydrology* 331, no. 1–2 (2006): 73–84, <https://doi.org/10.1016/j.jhydrol.2006.04.041>.

⁵⁸ Pixels depicting a local fire detected via remote sensing with fire confidence greater than 50%

⁵⁹ Photon count acting as proxy for fire pixel temperature

⁶⁰ Dube, O.P. 2013. Challenges of wildland fire management in Botswana: Towards a community inclusive fire management approach. *Weather and Climate Extremes*, 1:26–41

⁶¹ See Annex 2 Section 2 Carbon and Water Baseline for more information and references.

⁶² Nkemelang T, New M and Zaroug M. 2018. "Temperature and precipitation extremes under current, 1.5 °C and 2.0 °C global warming above pre-industrial levels over Botswana, and implications for climate change vulnerability," *Environmental Research Letters* 13 (6). <https://doi.org/10.1088/1748-9326/aac2f8>

⁶³ Republic of Botswana. 2019. Botswana's Third National Communication to the UNFCCC. Available at: https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/3567491_Botswana-NC3-1-BOTSWANA%20THIRD%20NATIONAL%20COMMUNICATION%20FINAL%20.pdf

proliferation, densification, and encroachment of trees into traditional rangeland areas⁶⁴. Although conversion of rangelands by bush encroachment and invasions will lead to increased carbon stocks within above-ground biomass pool, soil organic carbon typically accounts for 12–20 times the stored carbon within these ecosystems. The herbaceous layer contributes significantly more soil organic matter than the woody layer; a recent study in South Africa⁶⁵ found that 60–90% of the SOC in the top 20 cm of the soil was composed of grass organic matter. It is therefore likely that the conservation and restoration of ancient, open rangeland ecosystems will result in greater carbon benefits than allowing for their conversion to a treed state (e.g. through afforestation). Higher maximum temperatures and increasing drought intensity and frequency are increasing the area of natural rangelands converted to bare ground (reducing biomass by over 30%) and negatively affecting water systems⁶⁶. These shifts are increasing ground temperatures and reducing forage quality and quantity. As a result, ecosystem carbon stocks are decreasing, and livestock methane emission intensity from enteric fermentation is higher than in the past, when livestock were able to graze in cooler conditions on more digestible, high-quality forage.

- 12.** Botswana is committed to reducing their GHG emissions. The Government of Botswana set a target of 15% emissions reduction from its 2010 baseline by 2030 in its NDCs to the UNFCCC. The Agriculture, Forest, and Other Land Use (AFOLU) sector accounts for 13.4% of emissions and is the second largest source of GHG emissions in the country, behind energy production^{67,68,69}.

Projected Climate Change Impacts in Botswana

- 13.** Despite the intent of the Paris Agreement to reduce emissions to a level resulting in less than 2 degree warming, global temperatures are on pace to increase by the 1.5 degree threshold by the end of the next decade and 3.2 degrees by the end of the century, with higher temperature increases expected in Botswana⁷⁰. There is therefore an urgent need for Botswana to prepare and to adapt. While current impacts of climate change in Botswana are already severe, downscaled projections from various global models (RCP4.5) show that additional, potentially catastrophic climate impacts can be expected by 2050⁷¹ (see Figure 6).

- 14.** Temperatures across Botswana are likely to increase by between 1.5 and 3.5 °C by 2050. Daytime maximum temperatures are likely to increase by ~2.0°C in the southwest and

⁶⁴ J Andringa, "The Climate of Botswana in Histograms," Botswana Notes and Records 16 (1984): 117–25, <http://journals.co.za/docserver/fulltext/botnotes/16/1/748.pdf?expires=1512601715&id=id&accname=guest&checksum=C606DC53AD270E341F433DF0D3E11203>.

⁶⁵ Vetter et al, 2020. 'With Power Comes Responsibility – a Rangelands Perspective on Forest Landscape Restoration' <https://doi.org/10.3389/fsufs.2020.549483>

⁶⁶ Setshwaelo LL. 2001. *A study of Grassland/livestock vulnerability and adaptation to climate change*. Government of Botswana.

⁶⁷ Ministry of Environment, Natural Resources, and Tourism (MENT, 2019). Third National Communication.

⁶⁸ National Development Plan

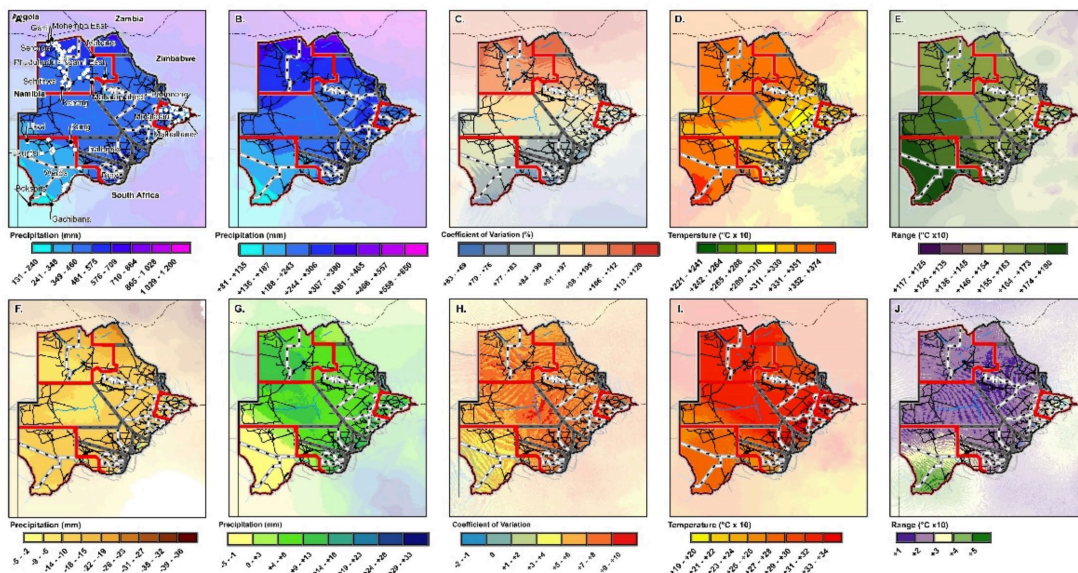
⁶⁹ Republic of Botswana. 2019. Botswana's Third National Communication to the UNFCCC. Available at: https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/3567491_Botswana-NC3-1-BOTSWANA%20THIRD%20NATIONAL%20COMUNICACION%20FINAL%20.pdf

⁷⁰ ASSAR, 2019. Adaptation at Scale in Semi-Arid Region 2014-2018: Insights from Botswana. Available at <http://www.assar.uct.ac.za/Botswana>

⁷¹ See Annex 2. Feasibility Assessment, Section 1 Country Profile and Climate Vulnerability Assessment

~3.4°C in the northern (Ngamiland) and eastern regions (Bobirwa) by 2050 under RCP 4.5 (Figure 7). Increased day time temperatures are closely matched by increased night-time temperatures with the average diurnal/nocturnal range rising by 0.1–0.2°C across most of Botswana. Climpact analyses indicate that the extreme maximum temperatures (90th percentile) experienced historically are becoming increasingly common over persistent periods (six days). The number of days contributing to such events used to range from 0-40 days/year (1950-2000) and are expected to increase to 40-100 days/year under RCP 4.5 and 80-150 days/year under RCP 8.5 by 2050⁷².

15. Annual average precipitation will decrease 5-18 mm annually (3-15% as presented in the Botswana’s Third National Communication (TNC) to the UNFCCC), but a 4–13 mm increase across three peak rainfall months associated with summertime convective precipitation. This decrease in projected precipitation is greater in northern areas where a decrease of ~32 mm is expected. However, the three-month precipitation peak is projected to increase across most of Botswana by 4–13 mm during these high-rainfall months. The coefficient of variation, already high in the central to northern areas of Botswana, will increase further (in some areas up to 10%) which will further worsen the year-on-year precipitation variability and longer dry seasons can be expected across the country.



Baseline Climate Analysis (1985 - 2005)
A. Annual Precipitation
B. Precipitation of the wettest 3 months
C. Coefficient of Variation
D. Max Temperature of Warmest Month
E. Mean Diurnal Range

Project Climate Analysis (2040 - 2060)
RCP4.5
F. Annual Precipitation Anomaly
G. Wettest 3 months Anomaly
H. Coefficient of Variation Anomaly
I. Warmest Month Anomaly
J. Change in Mean Diurnal Range

N
 1:16 640 925
 0 145 290 580 870
 Kilometers

⁷²Ibid.

Figure 7: Principle current variables (top) and projected climate anomalies (bottom) for Botswana⁷³.

16. Extreme heat waves are expected to significantly increase under RCP 4.5 and 8.5 scenarios from ~2 heatwaves/year historically to 5-10 heatwaves/year by 2050⁷⁴. Future probability of drought occurrence, including severity and duration of drought events, increase under most RCP scenarios. Even with a projected increase in annual precipitation in a model, increasing temperatures intensifies evapotranspiration and leads to increased drought frequency (see Figure 7). The maximum heatwave durations used to be <20 days before the year 2000, but are expected to significantly increase in future. The rate of increase under RCP 8.5 scenario is approximately 2.5 times greater than under RCP 4.5⁷⁵. Within Ngamiland, the temperature will increase over time with the maximum average anomaly being ~3.3°C by 2050 under RCP 4.5 in every month, with the largest increases being in October (see Figure 8). This increase will be expressed in extreme temperatures and heatwaves, and the expected number of days above 36°C (extreme heat stress) from ~3 to +20 days (RCP 4.5) by 2050. In addition, 3-day heat waves are projected to increase by ~143% by the mid-2050's⁷⁶. Increased temperatures and heat waves will result in an increase in evaporation of surface water, reducing water infiltration and further complicating the predictability of water availability which is critical to the broader regional population and economy.

⁷³ Hijmans, R.J., S.E. Cameron, J.L. Parra, P.G. Jones and A. Jarvis, 2005. Very high-resolution interpolated climate surfaces for global land areas. *International Journal of Climatology* 25: 1965-1978

⁷⁴ Climpact HWD-EHF Analysis (2020)

⁷⁵ Ibid

⁷⁶ SPEI dataset 2020 - <https://spei.csic.es/>

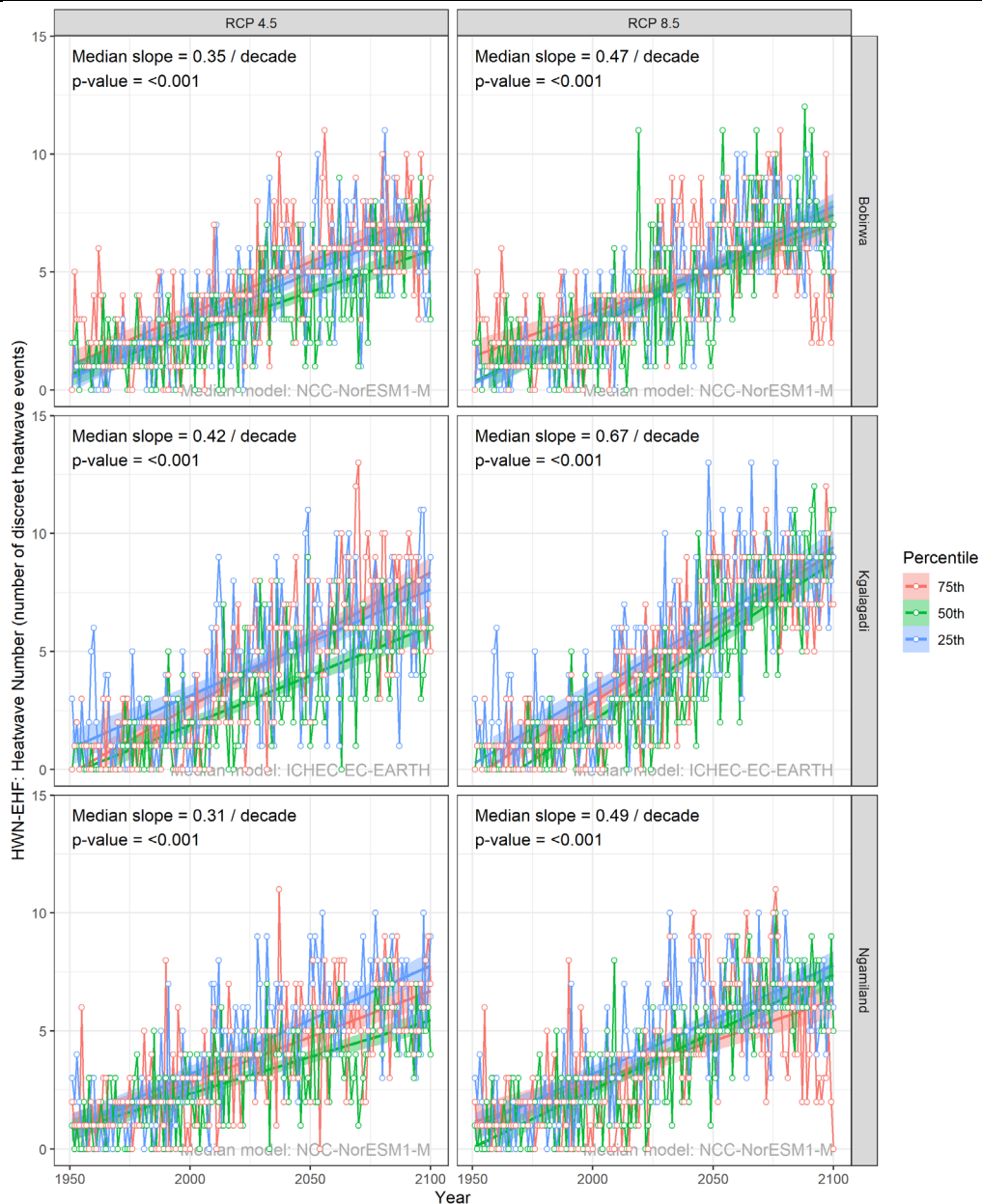


Figure 8: Projected number of discrete heatwave events across the Project Areas from 1951-2100⁷⁷

17. Extreme water scarcity is expected to become increasingly common and severe across the Project Areas as a result of hydrological drought conditions. A *Climpact* analysis of the meteorological water balance between precipitation and evapotranspiration, using SPEI, reveals that the intensity, duration and frequency of drought conditions are projected to worsen relative to the historical conditions (see Figure 9). This will reduce the resilience of rangeland ecosystems to the impacts of grazing and fire, likely resulting in accelerated degradation cycles under current management regimes. The rural “last-mile” communities targeted by the Project are likely to be disproportionately impacted by these changes due to their limited baseline adaptive capacity, access to drought relief programmes, and alternative livelihood options.

⁷⁷ Climpact HWN-EHF Analysis (2020)

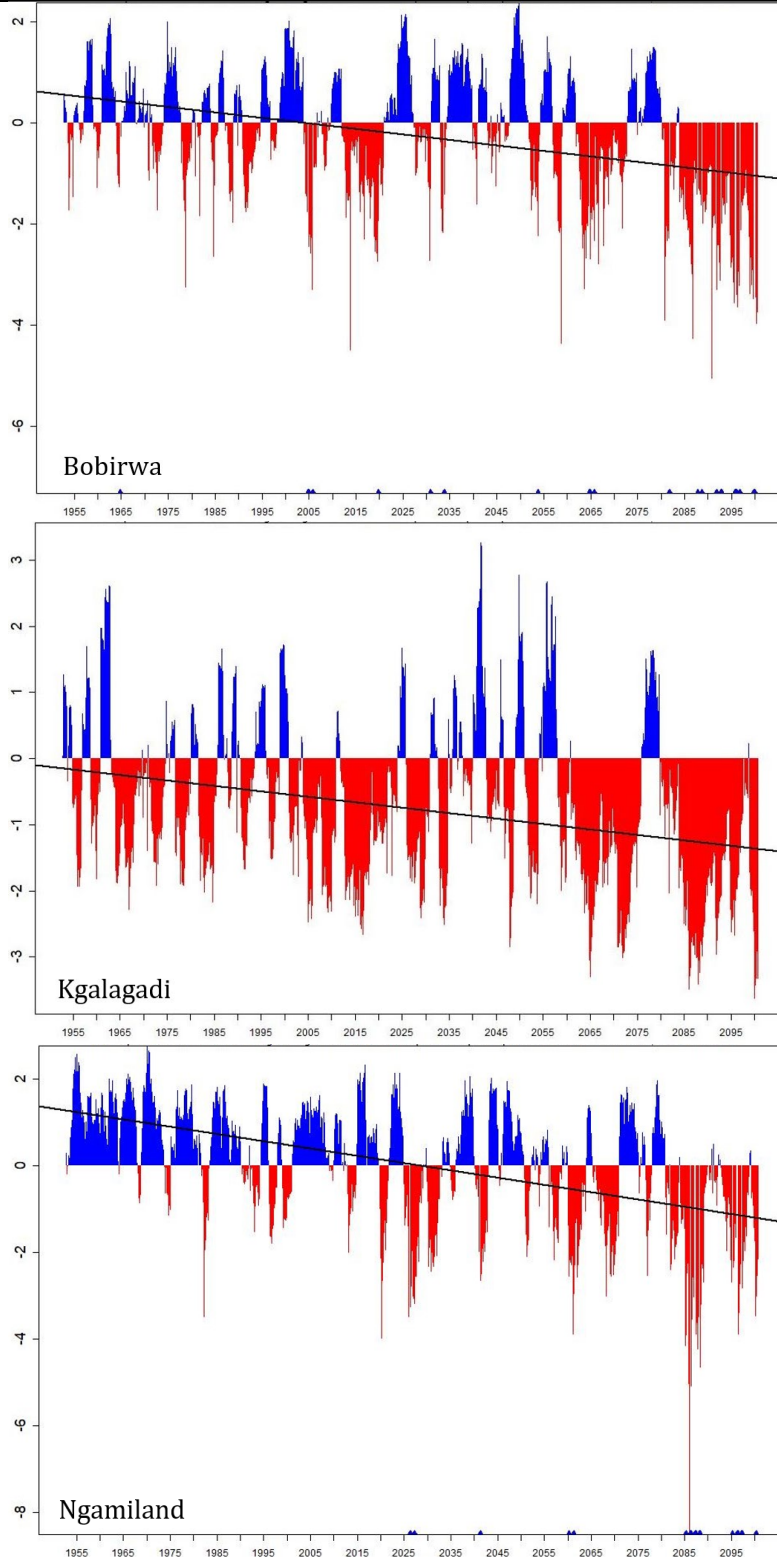


Figure 9: Projected Standardised Precipitation-Evapotranspiration Index (SPEI) across Project Areas from 1951-2100⁷⁸

18. Botswana's rangeland ecosystems will continue to experience negative impacts from climate change. The increased concentration of carbon dioxide in the atmosphere may shift

⁷⁸ Climpact SPEI Analysis (2020)

vegetation composition favouring plants with the C₃ photosynthetic pathway (e.g., shrubs) over plants that possess the C₄ photosynthetic pathway (many grasses). This will promote proliferation of shrubs, invasive plants, and the loss of biodiversity⁷⁹. These negative impacts will be worse for already degraded communal rangelands as the undesirable plants have an advantage due to reduced competition for water and nutrients. The increased drought frequency is also expected to significantly reduce rangeland productivity across the three Project areas and throughout the country. Projected increased temperatures, increased evaporation and low rainfall will also increase soil temperature and reduce forage quality and quantity because of limited soil moisture⁸⁰. More intense rainfall events will increase erosion and potentially create conditions for increased outbreaks of devastating pests (such as corn cricket swarms that destroy vegetation and tick outbreaks that are carriers of diseases such as heartwater and rain scald (bovine dermatophilosis)⁸¹.

19. Livestock sector productivity will decrease and GHG emissions will increase due to climate stress. The direct greenhouse gas contribution of the livestock sector, in the case of ruminants such as cattle, sheep and goats, is from enteric fermentation and manure management⁸², which account for approximately half (39% and 10% respectively) of total livestock emissions globally⁸³. The production, processing, and transport of livestock feed accounts for approximately 90% of the remaining emissions, none of which is applicable in extensive communal grazing systems in Botswana. Similarly, manure management is not a consequential contributor to greenhouse gas emissions in extensive compared with intensive systems⁸⁴. The impact of climate change on Botswana's livestock sector is felt in terms of reduced productivity and will result in increased enteric fermentation-based emissions where poor grazing quality and energy expenditure required to obtain water and nutrition increases the amount of enteric fermentation per unit intake, reducing production efficiency and increasing overall emissions intensity⁸⁵.

20. Increased temperatures above a threshold of 32°C⁸⁶ results in heat stress for cattle, especially for the exotic breeds that are less tolerant to heat than local breeds (Tswana). The projected number of high temperature days and consecutive dry days (CDD). Climact analysis shows a significant increase in the number of days over 30 degrees across all three project areas (Figure 10). This will result in reduced feed intake, decreased growth/mass, reduced reproduction rates, and increased susceptibility to diseases⁸⁷ which can dramatically impact poor farming households and reduce the profitability of the livestock sector overall. Increased temperatures also increase livestock exposure to parasites and

⁷⁹ Ward, "A Resource Ratio Model of the Effects of Changes in CO₂ on Woody Plant Invasion," *Plant Ecology* 209, no. 1 (2010): 147–52, <https://doi.org/10.1007/s11258-010-9731-z>.

⁸⁰ See Annex 2 Feasibility Study, Section 3 Carbon and Water Baseline

⁸¹ Monde Rapiya, Heidi-Jayne Hawkins, Voster Muchenje, John F Mupangwa, Munyaradzi C Marufu, Kennedy Dzama & Cletos Mapiye (2019) Rotational grazing approaches reduces external and internal parasite loads in cattle, *African Journal of Range & Forage Science*, 36:3, 151-159, DOI: 10.2989/10220119.2019.1628104

⁸² Giampiero Grossi et al., "Livestock and Climate Change: Impact of Livestock on Climate and Mitigation Strategies," *Animal Frontiers* 9, no. 1 (2019): 69–76, <https://doi.org/10.1093/af/vfy034>.

⁸³ P.J. Gerber et al., *Tackling Climate Change through Livestock: A Global Assessment of Emissions and Mitigation Opportunities*, Most, vol. 14 (Rome, Italy: Food and Agriculture Organization of the United Nations (FAO), 2013), <https://doi.org/10.1016/j.anifeedsci.2011.04.074>.

⁸⁴ GRA and SAI, "Reducing Greenhouse Gas Emissions from Livestock: Best Practice and Emerging Options," 2015, <https://ccacoalition.org/es/resources/reducing-greenhouse-gas-emissions-livestock-best-practice-and-emerging-options>.

⁸⁵ N. Wrage et al., "Phytodiversity of Temperate Permanent Grasslands: Ecosystem Services for Agriculture and Livestock Management for Diversity Conservation," *Biodiversity and Conservation* 20, no. 14 (2011): 3317–39, <https://doi.org/10.1007/s10531-011-0145-6>.

⁸⁶ Archer van Garderen, E.R.M. 2011. Reconsidering cattle farming in Southern Africa under a changing climate. *Weather, Climate & Society* 3(4): 249-253

⁸⁷ Sejian V, R Bhatta, N.M Soren, P.K Malik, J.P Ravindra, C.S. Prasad, R Lal. 2015. Introduction to Concepts of Climate Change Impact on Livestock and Its Adaptation and Mitigation. (eds.), *Climate Change Impact on Livestock: Adaptation and Mitigation*

disease especially vector-borne diseases that may further limit productivity⁸⁸ and exacerbate livestock emissions. Overall, future climate conditions are expected to negatively affect 1,725,000 livestock units (83% of total current national herd⁸⁹ and correspondingly increase emissions from the sector as poor animal conditions are exacerbated by climate impacts⁹⁰. For the Project's targeted cattle herd (~320,000 units), the BAU scenario projects increased emissions of ~340,000 tCO₂e/year⁹¹.

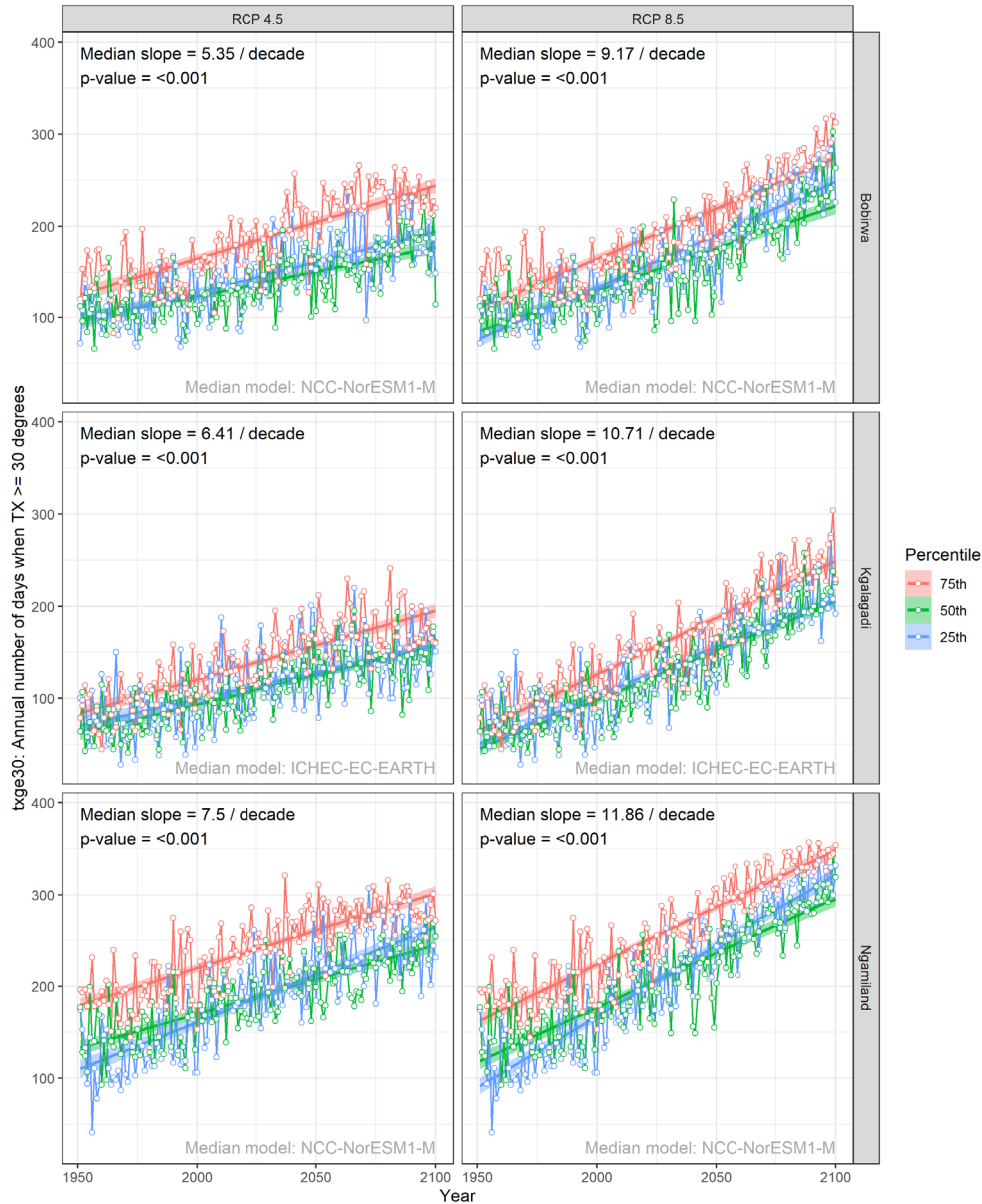


Figure 10. Annual number of days when the daily maximum temperature is greater than or equal to 30°C between 1951 and 2100 are consistently increasing across the Project Areas, negatively impacting livestock capacity to absorb nutrition and increasing enteric GHG emissions.

21. Climate change will continue to contribute to the degradation of Botswana's rangelands, and further reduce this ecosystem's ability to sequester carbon. As temperatures increase,

⁸⁸ Thornton, P., Herrero, M., Freeman, A., Mwai, O., Rege, E., Jones, P. & McDermott, J., 2007. Vulnerability, climate change and livestock – Research opportunities and challenges for poverty alleviation. SAT eJournal 4 (1), 1-23.

⁸⁹ CIMA, UNISDOR (2018) Botswana Disaster Risk Profile.

⁹⁰ Wilkes et al., "Measurement, Reporting and Verification of Greenhouse Gas Emissions from Livestock: Current Practices and Opportunities for Improvement."

⁹¹ See Feasibility Study Section 3, Appendix 3.3 – IPCC Livestock Emissions Calculations

droughts become more frequent and severe, and as rainfall becomes less regular with larger precipitation events, rangelands experience higher rates of erosion and less vegetation is able to grow. Sandy soils, such as those that characterize the majority of Botswana, are often more sensitive to the effects of resulting bare ground degradation as erosion of the shallow topsoil exposes a subsoil horizon that is often unsuitable to the production of palatable fodder, leading to bush encroachment⁹². Bare ground degradation includes the reduction or loss of biological or economic productivity following a reduction of vegetative cover and subsequent processes⁹³. This degradation results in a loss of carbon stored in the ecosystem, most notably from the soil carbon pool, because of greater rates of soil erosion and reduced rates of soil carbon accumulation due to a reduction in vegetative productivity^{94, 95}. By slowing and reversing rangeland degradation⁹⁶ through improved management practices, the Project will achieve direct mitigation benefits including carbon sequestration from greater soil carbon storage and emissions reduction from avoided soil carbon losses⁹⁷.

22. Poverty levels and vulnerability are likely to increase as climate change contributes to increased degradation of Botswana's communal rangelands. The combined impact of increased drought frequency, higher temperatures and reduced precipitation will be most strongly felt by smallholders who are dependent on communally shared rangelands⁹⁸. The vast majority of the country's low-income population is dependent on the country's communal land, particularly indigenous communities and female headed households (see Gender Assessment and GAP). More than 55% of all communally owned livestock is owned by individuals 65+ years of age, who have fewer alternative livelihood options. Land degradation results in poor animal condition and reduces cattle off-take from communal lands because farmers are less able to sell low weight cattle. Losses are projected to increase across all livestock (cattle, sheep, and goats) from poor management and higher exposure to disease and climate stress. The opportunity costs to bring cattle to large towns for sale are also increased due to high mortality rates during transport to these markets with an observed mortality rate increasing from 11.8% in 2015 to 15.1% in 2017 for communal herds. Mortality also increases in herds of less than 100 cattle typical of poorer

⁹² Frits Van Oudtshoorn, *Veld Management: Principles and Practices* (Pretoria: Briza Publications, 2015).

⁹³ Government of Botswana, "Botswana National Action Programme to Combat Desertification."

⁹⁴ C. J. Barrow, *Land Degradation: Development and Breakdown of Terrestrial Environments*. (Cambridge, UK: Cambridge University Press, 1991).

⁹⁵ A. Warren and C. Agnew, "An Assessment of Desertification and Land Degradation in Arid and Semi-Arid Areas," *International Institute for Environment and Development, Drylands Programme, Paper 2* (London, UK, 1988).

⁹⁶ In the context of extensive livestock production, and for the purposes of this project, degradation is defined based on the production potential of the land. This is quantified based on the rangeland condition assessments described in Annex 11, where degraded rangelands reflect poor rangeland conditions. In brief, the condition of a particular site is quantified based on the grass species composition, fractional bare ground and phytomass production relative to an ideal reference state norm. Several approaches to estimating condition are commonly applied in analogous ecosystems. In practice, any standard should represent veld in its best possible condition for the ecological zone. The Weighted Palatability Composition Method utilizes the forage production potential ratings of common grass species to determine the livestock production potential. Rangeland condition is calculated based on the relative production potential as compared with an ideal reference site. The Benchmark Method also utilizes grass species composition to determine rangeland condition but does so on the basis of the species ecological group classification relative to a reference site, as described in Annex 11, Appendix 11.1. The Ecological Index Method employs a similar approach to the Benchmark Method, but with further distinction of the ecological groups based on expert opinion of the grass species response to under- or over-grazing. The Key Species Method is a simplified approach to the Ecological Index Method and only considers key indicator species that are known to be especially sensitive to different grazing conditions and therefore more reflective of the ecological condition. Through any of these methods, the forage quality, production potential, carrying capacity and degradation risk can be determined based on repeat monitoring over multiple growing seasons to identify directional trends in the key indicators. The norms for this project will be determined at the level of village grazing areas by the M&E team in collaboration with the Ministry of Agriculture. More information on the indices informing the quantification of rangeland condition are provided in Annex 11.

⁹⁷ See Annex 2 Feasibility study, Section 3, Carbon and Water Baseline, and Annex 22 GHG ER calculations.

⁹⁸ Zhou P.P., T Simbini, G Ramokgotlwane, T.S Thomas, S. Hachigonta, L.M Sibanda. 2013. Botswana. In *Southern African Agriculture and Climate Change: A comprehensive analysis*. Chapter 3 Pp. 41-70. Washington, D.C.: International Food Policy Research Institute (IFPRI).

households⁹⁹. Among Botswana's communal farmers, those in the drylands¹⁰⁰, as well as poorer households and female-headed households with few animals, are especially vulnerable to these impacts¹⁰¹.

23. Increases in area of degraded rangeland will also exacerbate conflicts between agriculture and tourism needs. Climate change's direct impacts on fodder and water resources will augment competition for available resources and negatively impact the viability of both livestock and wildlife. For example, African buffalo are a host population for FMD in Botswana¹⁰² and when fodder and water resources are constrained during drought events, the probability that the remaining sources, artificial or otherwise, will be visited by both populations increases. Increased frequency of contact increases the probability of outbreaks that can lead to a complete trade ban for a six-month period and require a significant investment into a vaccination regime. When communal farmers move animals into wildlife movement corridors that are used for ecotourism purposes, the negative perception of cattle in "wilderness experiences" diminishes the tourism experience or causes wildlife to move out of the area^{103, 104}. Elephant poaching, bushmeat consumption, and human-wildlife conflict are projected to increase in the future as humans, livestock, and wildlife compete for survival.

Project Context and Climate Vulnerability in Target Areas

24. As a dryland country in Southern Africa, 70% of Botswana's total land area of 572,000 km² is covered by rangelands grazed by both livestock and wild animals. Nearly 70% of Botswana is under tribal/communal land tenure. 25% is held by the state with 17% (of the 25%) in conservation areas, and the remaining 5% is under private ownership, primarily by commercial farmers. While conservation and private lands tend to be managed with ecological limits in mind and budgets to support adaptation, because of "the tragedy of the commons¹⁰⁵" and poverty, populations on communal lands are least able to adapt. Management systems in communal areas are limited and individual household incentives are not aligned with the common goal of sustainable management of the landscape.

25. The Botswana national livestock herd is approximately two million animals. Botswana legislation defines a herd of more than 400 animals as commercial, though this is loosely applicable with some private farmers having fewer than this number of livestock, but still granted private land. Using the ratios between communal and commercial operations, CI estimates that only 30% of the country's animals are in herds of more than 400 animals that have a structure for breeding and commercial production. 70% are estimated to be in

⁹⁹ Statistics Botswana. 20174. Annual Agricultural Survey Report

¹⁰⁰ Dreber N, T.M Kong, K Kellner, C.J Harmse, A Van Eeden, A Ocampo-Melgar. 2014. Towards Improved Decision-Making in Degraded Drylands of Southern Africa: an Indicator Based Assessment for Integrated Evaluation of Restoration and Management Actions in the Kalahari Rangelands. GRF Davos Planet@Risk 2(1), Special Issue

¹⁰¹ Omari, K. 2010 Climate Change Vulnerability and Adaptation Preparedness in Southern Africa—A Case Study of Botswana. Heinrich Böll Stiftung Southern Africa (HBS)

¹⁰² Genevieve V. Weaver et al., "Foot and Mouth Disease: A Look from the Wild Side," *Journal of Wildlife Diseases* 49, no. 4 (2013): 759–85, <https://doi.org/10.7589/2012-11-276>.

¹⁰³ <https://www.dailymaverick.co.za/article/2018-01-15-tourist-anger-over-cattle-grazing-in-mapungubwe-national-park/>

¹⁰⁴ Tourism contributed 13.4% of the GDP in 2018. <https://www.wtfc.org/about/media-centre/press-releases/press-releases/2019/botswana-tourism-now-accounts-for-one-in-seven-of-all-dollars-in-the-economy/>

¹⁰⁵ The "tragedy of the commons" is a situation originally put forth by William Forster Lloyd in 1833 to describe the impacts of uncontrolled grazing in common areas of the United Kingdom and expanded by Garrett Harden in 1968 to describe in a shared-resource system where individual users, making decisions for their own self-interest, negatively impact the common good of all users by depleting or degrading the shared resource base for all as a result of the sum of the groups actions.

inefficient herd structures with a higher proportion of older, unproductive animals that are more than 5 years of age and have higher emissions rates per unit of production.

- 26.** Communal livestock production - production on non-tenured communal or “tribal” grazing lands where owners generate livelihoods from a communally shared rangeland resource with equal access rights by all, is the dominant land use across the country, representing 97% of the country’s production (including commercial herds reared on communal lands). As a result, Botswana’s beef production depends strongly on the success of communal livestock producers. Nationally, the livestock sector contributes 65% of the agricultural GDP for both domestic consumption and export. Despite contributing only 2–3% of the country’s Gross Domestic Product (GDP), the sector constitutes ~70% of rural livelihoods^{106,107}. In addition to supporting livelihoods, livestock play a central role in the cultural practices of the people of Botswana¹⁰⁸. The wildlife economy (via tourism and hunting in natural rangelands) is also critical to the economy and rural employment in this sector makes up more than 13% of national economic activity¹⁰⁹. Botswana’s rangelands are therefore socially and economically critical. They provide insurance or a “bank account” for people in times of need, especially resource-poor farmers in communal or customary land¹¹⁰ and they make a large and essential economic contribution to Botswana’s sustainable development.
- 27.** Land for communal production systems is decreasing in size as prime lands, typically those located closer to road infrastructure and with water resources, are privatised and fenced off for commercial livestock and tourism concessions. Current fence-based management practices are ill-suited for addressing rangelands management under climate change as they reduce the mobility required for wildlife and livestock in the face of increased climate variability and stress. Fence-based systems also lead to increased degradation that has a negative impact on land and livestock GHG emissions¹¹¹. The Botswana Department of Veterinary Services (DVS) and other national and regional stakeholders now recognize the problematic nature of fence-based management and are now seeking innovative alternatives¹¹².
- 28.** The Project will be implemented in the communal lands of three areas: Ngamiland, Kgalagadi, and Bobirwa (Figure 2). The Project areas were selected in 2016 by national stakeholders as being home to the “most climate-vulnerable populations” in Botswana based on the proportion of land in communal land tenure and the highest proportion of rural poor dealing with severe climate impacts, particularly drought. The three target Project areas

¹⁰⁶ World Bank 2019. Botswana Country Profile.

¹⁰⁷ Government of Botswana. 2012. Agriculture and Food Security Policy Brief: Reflecting on the challenges of attaining a Green Economy for Botswana.

¹⁰⁸ Such as for *lobola*, which is a type of dowry payment made as an aspect of a traditional marriage.

¹⁰⁹ <https://www.wtfc.org/about/media-centre/press-releases/press-releases/2019/botswana-tourism-now-accounts-for-one-in-seven-of-all-dollars-in-the-economy/>

¹¹⁰ Botswana Land Policy, 2011. Ministry of Lands and Housing.

¹¹¹ Guidelines on Commodity-Based Trade Approaches for Managing Foot and Mouth Disease Risk in Beef in Southern Africa 3rd Edition, Animal & Human Health for the Environment And Development (AHEAD)

¹¹² Dr Peter J Fernandez, Dr Susanne Münstermann, OIE PVS Evaluation Follow-Up Mission Report, World organization for Animal Health, May 2019

have an estimated combined population of ~300,000 people (Table 2). The areas are characterized by a low average population density, remoteness, and lack of access to services – which are specific factors that reduce the adaptive capacity of many households. Poverty in the areas also correlates with distance from the main urban centres, and in the rural regions of all three Project areas, poverty levels exceed 50%¹¹³. A greater proportion of female-headed households are found in the rural areas than in the urban centres, and these households are observed to have lower adaptive capacity¹¹⁴.

Table 2. Current population demographics in Target Areas (projections based on 2015 census)

Project Area/District	Size (ha)	Total Population ¹¹⁵	# Females	# Males
Bobirwa/Central	2,222,992	75,018	40,509	34,509
Ngamiland/Ngamiland	11,181,993	175,520	94,780	80,740
Kgalagadi/Kgalagadi	10,583,881	58,671	28,749	29,922
TOTAL	23,988,866	309,209	164,038	145,171

29. While the geographies of the rangelands in these areas include distinct features, the specific habitats of the communal grazing lands targeted by the project are remarkably similar. They fall along a spectrum of savannah ecosystems that are differentiated by precipitation levels and soil types. Bobirwa has more clay-rich soils that support more woody species and surface water sources; the Kgalagadi and Ngamiland communal grazing areas have sandier soils and sub-surface water sources only accessible through boreholes and seasonal pans. The biodiversity of the rangelands, particularly in palatable grass species across the three communal grazing areas are the same, as are the predator species. Many of the faunal species are common across the three Project areas, with population densities decreasing in the more arid Kgalagadi. As a result, the three areas respond ecologically to climate change similarly and will require similar herbivore management for regeneration and emissions reduction impacts (Table 3).

Table 3. Description of the climate-ecological current and projected state across the communal lands in the three Project areas.

Area	Ecosystem Description	Current Climate	Current Degradation	Climate Projections	Projected Degradation
Ngamiland	The Okavango Delta and Panhandle is a mosaic of permanent swamps, fossil alluvium and floodplains with Kalahari sandveld	30.1°C 703mm/year	Bare ground: 57.6% Soil carbon: 4,470 tCO ₂ e/ha Grass digestibility: 40%–45%	+0.23 °C/decade -6.54mm/decade	Change in climatic suitability of medium to high value grazing species: -40% to +5%

¹¹³ Botswana Poverty Map (2015), Statistics Botswana (2015)

¹¹⁴ See Annex 8, Gender Analysis and Action Plan

¹¹⁵ Based on Projections calculated from Botswana Poverty Map (2015). Mid-range scenario.

	and mopane shrub savanna dominating the rest of the district.				
Kgalagadi	Arid Kalahari sandveld with frequent salt pans evident in the northern and central regions of the district, fringed by a dense shrubland savanna. The southern region of the district is a mosaic of grassland and bare ground.	28.1°C 474mm/year	Bare ground: 89.3% Soil carbon: 2,143 tCO ₂ e/ha Grass digestibility: 32%–40%	+0.28 °C/decade -6.81mm/decade	Change in climatic suitability of medium to high value grazing species: -25% to -2%
Bobirwa	Hardveld and rocky hill ranges with more fertile soils, on average, than the sandveld that dominates over three-quarters of the country. Shrub and tree savannas dominate with some dense woodlands also present.	28.6°C 565mm/year	Bare ground: 43.3% Soil carbon: 4,044 tCO ₂ e/ha Grass digestibility: 40%–45%	+0.22 °C/decade -4.16mm/decade	Change in climatic suitability of medium to high value grazing species: -58% to -11%

30. Current livestock management practices across the three districts are similar with some regional variation that stem from climate and habitat-driven fodder, water availability and wildlife presence. Legally, all livestock farming practices must comply with the Diseases of Animals Act of 1977 (2008) which defines regulations pertaining to the prevention and control of diseases of livestock; regulates the import, export and movement of animals; and provides regulatory instructions for these issues such as quarantine and mandatory vaccinations. Compliance with this Act varies across the communal lands, particularly as veterinary support and oversight focuses on commercial production and is limited in these areas. An overview of current practices derived from stakeholder consultations is presented in Table 4 below.

Table 4: Description of current livestock practices in Project Areas

Livestock Management Practice	Description
Herd Movement	Current communal grazing systems in the Project areas lack analysis of and planning for distribution of animal impact and rest in extensive rangelands. Herd movement decisions are typically made at the individual household level on if herding should / can be practiced and where animals should graze and for how long, with most livestock left to uncontrolled grazing. In the Village Grazing Areas targeted by the Project, multiple farming households (15-200) make uncoordinated decisions pertaining to the utilization of the same natural resource, leading to degradation followed by poor animal performance. In Ngamiland, where market access options are most limited, animals are largely uncontrolled and wander independently in small groups looking for water and food. Unmanaged herds cause huge damage to crops, destroy riparian areas and water infrastructure, and cause numerous road accidents. There are an estimated 60,000 “uncontrolled” livestock that have moved from communal lands to Lake Ngami and now

	<p>have a year-round concentrated impact on this region that is vital for climate resilience. In addition, broken municipal water points force farmers to negotiate and purchase access to water on private lands where possible. In Bobirwa, animals were traditionally herded to available surface water, but many of these areas are fenced off for collective cropping purposes. This has created extensive conflict between livestock and crop farmers and encourages farmers to leave animals unmanaged to wander across croplands to water without fear of attack on the herder or owner en route. As a result, Bobirwa now has one of the highest rates of loss of livestock to road accidents, stemming from its poor animal management practices. In both Ngamiland and Bobirwa, herding was historically implemented by children who would group animals together for social purposes and thereby allowing rest and recovery and desirable concentrated herd impacts as they explored the grazing lands.</p> <p>With mandatory school attendance, this practice was eliminated, and modified herding is now conducted by children on their way to school (cattle dropping and fetching, which is now common practice). This results in livestock not being taken to more distant grazing areas and overgrazing around villages or water points (approximately 15km radius), or cattle wandering too far during the day for children to find and fetch them after school, increasing the risk of predation, theft, disease, accidents, or simply ending up at a water source only to be fetched by the owner on the weekend. The Kgalagadi is separated from an FMD red zone by a fence and the practices in this area consist of often elderly herders moving animals to and from the cattle post in a daily grazing pattern. Private drilling (both authorized and illegal) of new boreholes has enabled movement and concentration of animals into wilderness areas through payments to the private owner for water access. This results in high levels of energy expenditure when livestock are forced to wander far in search for grazing and water only to be fetched and kraaled (driven into an enclosure) at night. Herds may have as little as four to five hours effective grazing per day, which means animals exist at survival level as opposed to production level where weight gain and health are improved, and enteric fermentation emissions are reduced.</p> <p>In common grazing areas, the desired approach is collective herding where movement of animals distributes grazing impact and rest throughout the rangeland for maximum productivity. For example, the Project ESMP (Annex 6) describes the “traditional livestock system” in Ngamiland where animals were historically grouped in a “village herd” and were moved away from dry season grazing and water areas around Lake Ngami in the rainy season when water and fodder resources were available further away at seasonal pans. In this way, the entire larger Lake Ngami area was able to re-grow during the rainy season and provide fodder to maintain animal health in the lean, dry season.</p>	
Herd Health	<p>Current herd health levels across the three Project areas are extremely poor and in most instances the animal health status and level of herd immunity to controlled diseases (FMD, anthrax) through vaccination, are unknown. Herd health should be maintained through systematic implementation of a herd health plan with the provision of capacities and resources to ensure vaccination coverage and associated records of treatments, parasite control, and disease episodes. Most communal farmers do not have the skills and/or resources to develop and consistently follow a herd health management plan without external support.</p>	
Herd Composition	<p>Currently herd composition (age and sex ratio) is poorly managed or not managed at all, and many herds contain unproductive animals of advanced age. In addition, sub-optimal sex and gender ratios contribute to poor productivity. Typically, manipulating herd composition is a basic way to ensure optimal productivity and animal performance. Unproductive animals compete with productive animals for fodder and water resources and in so doing reduce overall herd performance. Breeds are also an important component of herd composition. In Ngamiland, CBPP (contagious bovine pleuropneumonia) controls resulted in the complete destocking of all cattle in the 1960s. Subsequently, the area was restocked with livestock from commercial farming areas in Namibia where FMD and CBPP had not occurred before, which is why the breed composition in Ngamiland is more exotic than indigenous. Also, many households who were not traditionally livestock farmers could obtain cattle during restocking efforts which resulted in many people owning cattle that were not livestock farmers and maintain a higher percentage of unproductive animals as a symbolic indicator of wealth.</p>	
Record-keeping	<p>Currently very few if any written records of herd ownership, animal ID, animal performance and health, or rangeland utilization are kept by communal farmers. These records not only enable decision making to ensure animal improvement and productivity, they also are a requirement for formal market access in Botswana. Best practice is to systematically keep animal records across all categories of production. Botswana has recently introduced a web-based electronic registration system requirement and this has become an additional barrier to market entry for communal farmers due to poor connectivity and limited expertise with technology.</p>	

Off-take	Currently, off-take across the project areas is low and strongly influenced by animal and rangeland performance that fluctuates between good and poor rainfall years. Off-take is forced during droughts or when short-term needs arise (e.g., funeral expenses or school-fee requirements). Ideally, off-take should be systematically planned to maintain optimal levels of herd size, natural resource health, and financial needs. In the two Project areas (Ngamiland and Bobirwa) that have not had market access due to their location in the FMD red zone, no formal off-take has been possible and as a result fewer acceptable livestock practices are observed in these areas due to lack of financial incentive or capacity to invest in improved husbandry practices.
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31. The Tribal Grazing Lands Policy (TGLP) 1975 (Amended in 1993) separates land into commercial grazing areas, communal grazing areas, and reserve areas, the latter of which was intended for use under climate stress. In none of the stakeholder consultations across the three areas were “Reserve Areas” for the communal lands known. Concerns raised in communal grazing areas included that private commercial farmers with larger herds (>400 animals according to the TGLP) move their herds into the communal lands to graze during droughts, effectively saving their own privately fenced commercial land for later use while dramatically impacting the availability of fodder for those who only have access to the communal grazing areas. This “dual grazing rights” issue is one of the key risks identified for building climate-resilience in communal rangelands and is elaborated on in the ESMP in Annex 6.

32. According to the Botswana Census 2015, there are 104 gazetted village areas that include main town/village areas and associated settlements (55 in Ngamiland, 34 in Kgalagadi, and 15 in Bobirwa). Climate vulnerability across the target communities within these areas was determined based on a detailed assessment for all 104 village areas’ exposure, adaptive capacity, and rurality (a measure of access to key services). As described in the Feasibility Assessment Section 1 climate change vulnerability assessment (CCVA), increased climate impacts such as the length of dry season and higher overall temperatures drive vulnerability, particularly in Ngamiland, which has the largest target population and therefore is a climate risk reduction priority for the government of Botswana. A summary of the key findings for the three areas is provided in Table 5 below.

Table 5: Summary of Climate Vulnerability Assessment for the Project Areas. SPI = Standard Precipitation Index

Key Findings of Climate Vulnerability Assessment	Bobirwa	Ngamiland	Kgalagadi
Temperature will increase	Average of 28.6°C Increase of 0.22 °C/decade, ±0.15 °C 95% confidence level	Average of 30.09°C Increase of 0.23 °C/decade, ±0.15 °C 95% confidence level	Average of 28.09°C Increase of 0.28 °C/decade, ±0.17 °C 95% confidence level
Frequency of drought	Will increase with an increase in SPI events in the very and extremely dry statuses	Will increase with an increase in SPI events in the very and extremely dry statuses	Will increase with an increase in SPI events in the very and extremely dry statuses
Rainfall will be more uncertain, and overall precipitation may decrease	Average of 565mm/year. Decrease of 4.16mm/decade, ±14mm 95% confidence level	Average of 703mm/year. Decrease of 6.54mm/decade, ±20mm 95% confidence level	Average of 474mm/year. Decrease of 6.81mm/decade, ±12mm 95% confidence level
# of days over 30 degrees	Likely to increase from 85 to 178 by 2050	Likely to increase from 98 to 219 by 2050	Likely to increase from 74.5 to 182 by 2050
# of days over 40 degrees	Likely to increase from ~1 to 3.2 by 2050	Likely to increase from ~1 to 4.3 by 2050	Likely to increase from ~0 to ~2.5 by 2050

33. The Project will target populations living within the 104 Village Grazing Areas (55 in Ngamiland, 34 in Kgalagadi, and 15 in Bobirwa). These populations are currently not part of either of the formal economic sectors (commercial beef production or tourism) and for the

most part are remote, “last-mile” communities. Their subsistence comes largely from Botswana’s social grant system; of which the widest reaching programme benefiting these households is the *Ipelegeng*, “cash for public works” programme. Formal reviews of *Ipelegeng* consistently show that despite substantial and growing investments in *Ipelegeng* since 2008 the Programme has not achieved its desired economic development and self-reliance goals¹¹⁶. This has resulted in a situation where the Project target households remain dependent on their livestock assets for their livelihoods.

34. The observed poverty levels in the target areas are attributed to 1) effects of drought on traditional agriculture; 2) limited alternative economic opportunities; and 3) lack of access to formal markets¹¹⁷. Cattle sales and births in the Project areas are lower relative to other regions in the county, whereas deaths, losses and eradication (due to veterinary control measures for disease) are higher than the national average¹¹⁸. A specific market barrier also exists related to the control of FMD - legislative restrictions are put in place in geographic zones where FMD is observed. In parts of Ngamiland and Bobirwa, all formal markets have been closed to trading by farmers for 78% of the last decade. This barrier limits possibilities for any income recovery by undertaking voluntary reduction in livestock numbers through offtake / sales during climate stress. It also reduces motivation for good animal husbandry and investments in communal land governance which result in a cycle of degradation and poverty.

Table 6. Baseline (2015) cattle population, sales, births, deaths, losses and eradication in the traditional sector¹¹⁹.

Project area	Cattle Population	Sales	Births	Deaths, losses and eradication ¹²⁰
Bobirwa	62,768	3,716	16,332	6,035
Kgalagadi	69,402	5,000	20,414	10,801
Ngamiland	190,187	12,283	50,170	30,362

35. Current adaptation strategies to additional climate stresses on livestock production in the target communities are limited and the impact and ability to respond to changing climate in these communal rangelands differs between women and men¹²¹. Both men and women own and participate in livestock farming activities. Wealthy households typically have higher numbers of cattle, and female headed households are more likely to have small stock (goats, sheep) which, although lower in value, are more resilient to climate stress. Men are observed to own and utilize more livestock, particularly cattle, for income generation and supporting dependents. As such, men are particularly vulnerable to the loss of large numbers of animals when fodder and water resources are impacted by extreme climate events. Income loss and the associated stress and productivity loss (due to the need to leave work to tend to animals) is a common vulnerability affecting both individuals and the broader community.

36. Adaptation strategies adopted by men like bushmeat hunting, grazing livestock at night, and poaching all put men at higher risk and increase security risks to the broader community and country. Women tend to be more involved in cropping activities which can

¹¹⁶ Mgomotsi et al, 2019; Nthomang, 2018; Jongman, 2018

¹¹⁷ Annex 2, Annex 6; Annex 8 and National Atlas.pg 11

¹¹⁸ Statistics Botswana (2017). Agricultural census 2017.

¹¹⁹ Statistics Botswana, “Botswana Agricultural Census Report 2015.”

¹²⁰ Does not include deaths due to slaughter for consumption and sales.

¹²¹ See Annex 8 Gender Assessment and Action Plan

include fodder production as well as growing food. Increasingly, women receive a portion of the income generated from farming activities, including livestock products (e.g., milk or hides) and livestock sales to pay for household expenses and childcare (Figure 11). When climate events impact these sources of income, there is a household reduction in food security and an increase in sex work to fill income gaps, which have disproportionately negative impacts on women and children¹²². Additionally, interviews during proposal development indicated that the most economically disadvantaged in Botswana, the communal herders, will be disproportionately affected by climate change, making them the most vulnerable population in Botswana (see Annex 8, Gender Assessment and Action Plan).

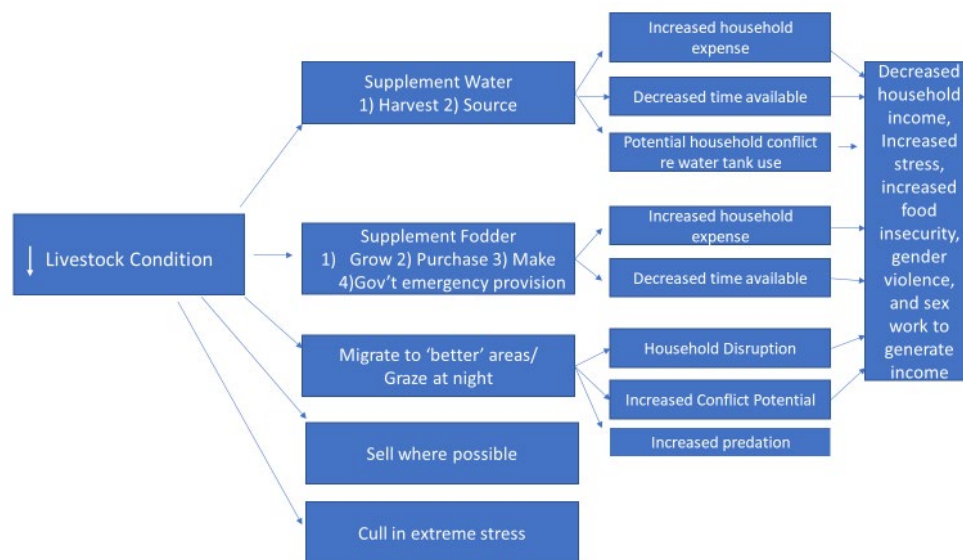


Figure 11. Primary adaptation strategies across the Project Area target populations to poor livestock condition resulting from climate stresses and associated livelihood and social impacts (Stakeholder Consultations, 2019/2020).

Project Context, Current Value-chain Climate Vulnerability, and GHG Emissions

37. Globally, livestock production accounts for 5-10% of all agricultural emissions contributing to climate change.¹²³ The growing middle-class of Africa, mostly living in urban areas, is driving demand that is expanding the number of cattle on the continent at an increasing rate, offsetting decreasing trends in the Americas and Europe (Figure 12). Yet while vegetarian and vegan diets gain popularity, for poor and malnourished populations, animal-based protein sources are critical for human health and child development¹²⁴. Feeding these vulnerable populations and addressing poverty under increased climate stress is a crucial challenge for nearly every country on the continent. As such, it is critical to expand availability of low-carbon meat product for Africa's growing middle class. Without transformational changes in production, by 2030 and 2050, 12% and 15% of Africa's meat will be supplied from less sustainable sources overseas.¹²⁵

¹²² University of Cape Town, South Africa, Adaptation at Scale in Semi-Arid Regions (ASSAR), 2014–2018, "Gender Is One Of Many Social Factors Influencing Responses To Climate Change An Assar Cross-Regional Insight" <http://www.assar.uct.ac.za/social-differences>

¹²³ IPCC, 1996. Climate change 1995. Impacts, adaptations and mitigation of climate change: Scientific-Technical Analyses. Contribution of Working Group II to the Second Assessment Report of the Intergovernmental Panel on Climate Change.

¹²⁴ Nathan Cofnas (2019) Is vegetarianism healthy for children?, Critical Reviews in Food Science and Nutrition, 59:13, 2052-2060.

¹²⁵ Livestock Data Innovation in Africa (2014)

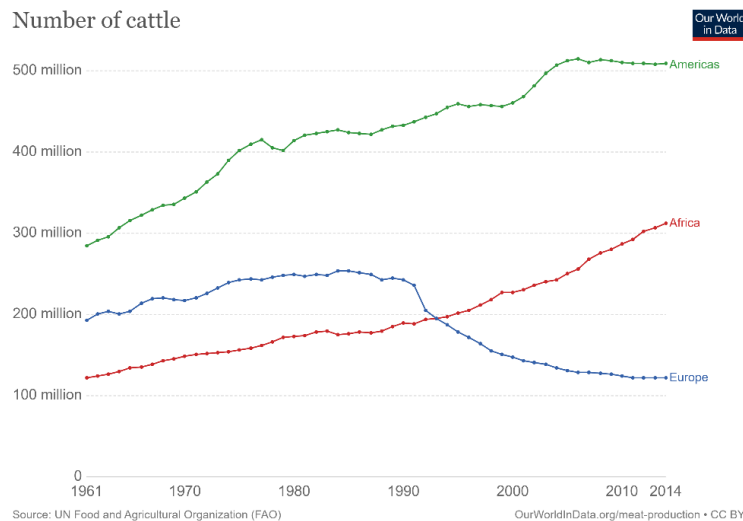


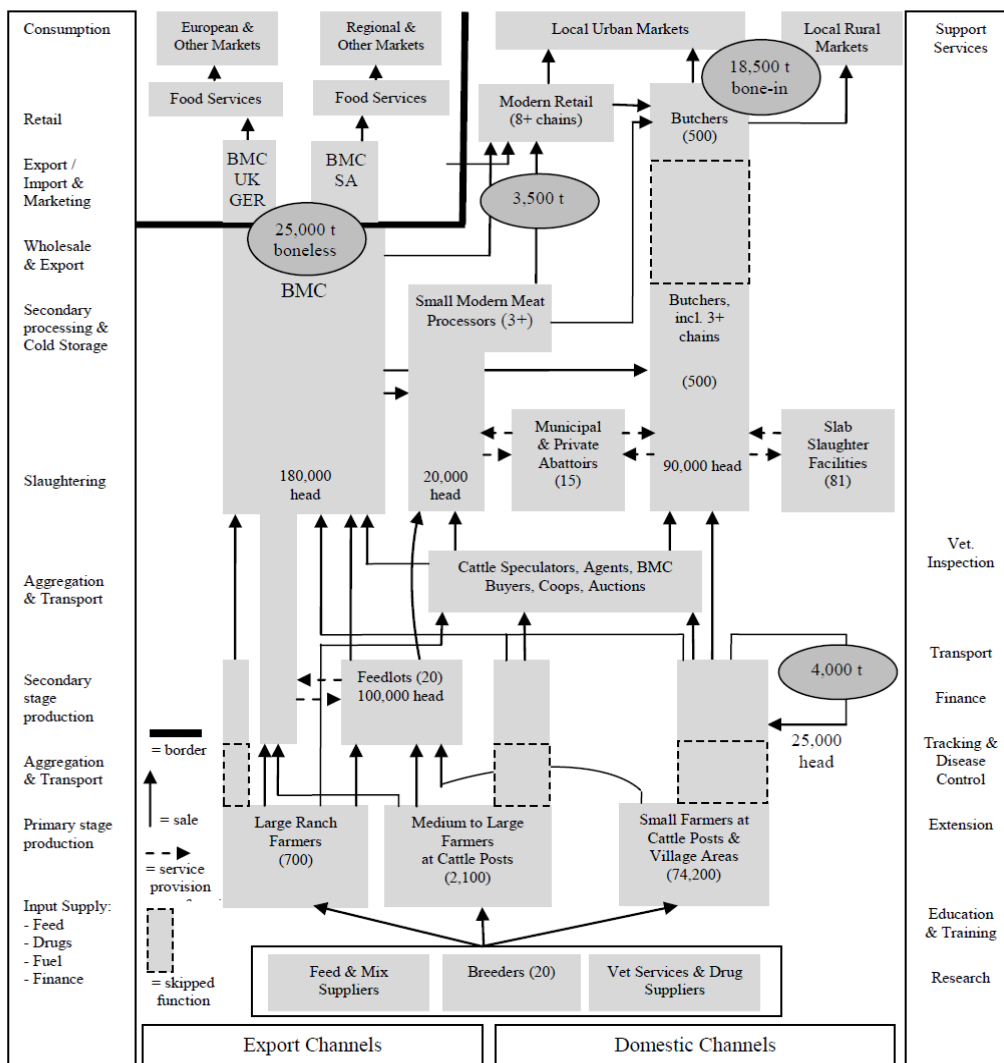
Figure 12. Cattle numbers are continuing to increase in Africa, in large part due to growing middle-class demand for meat.

38. Botswana's current value chains, with low local population densities and highly developed commercial livestock sectors, export a significant amount of protein to the continent and overseas. The export value of Botswana's beef in 2014 was US\$115m, making it Africa's largest beef exporter. In the same year, 57% of the cattle was absorbed by the country's primary exporter, the Botswana Meat Commission, a parastatal entity with a mandate to promote and operationalize Botswana beef exports.¹²⁶ The EU market is the most important export market for Botswana beef, given the premium prices it pays, and the preferential access provided to imports from Botswana. The EU's strict regulations, however, impose considerable costs across the value chain. Botswana's export competitiveness has decreased significantly over the last three decades, and advantages of preferential access granted under the interim Economic Partnership Agreement with the EU are being eroded by similar provisions in other bilateral and multilateral agreements the EU has entered into with other beef-producing countries. Nevertheless, maintaining its status as EU-approved offers Botswana important access for exporting to other countries, especially in the Middle East, where this status is a pre-condition for market access. Some studies have indicated that EU certification is offset by the significant costs added to the beef value chain for compliance with stringent standards, which are increasing as the EU responds to its consumers' concerns. These input costs, combined with the monopsony of BMC in this export arrangement to the EU, are driving new private sector entities, including Meat Naturally Botswana, to look at new opportunities in domestic and regional markets. Within the Ngamiland and Bobirwa Project areas, FMD outbreaks have led to intermittent but complete market closure for 78% of the last 10 years. Perverse incentives also currently exist, such as BMC offering higher prices for older, heavier animals, leading to maladaptive responses such as holding on to unproductive animals that result in increased emissions and vulnerability during climate stress. Within the Project target areas, there are seven licensed export abattoirs, two municipally run abattoirs, and numerous butcheries. However, consultations with farmers and local retailers have revealed that shortages for domestic consumption have arisen in all three areas when the limited local livestock production is used to fill export quotas, particularly in times of climate stress. Resilience in this sector and building a balance between supply for domestic consumption and export is therefore important for local food security.

¹²⁶ Dizyee, Baker, Rich (2017) "A quantitative value chain analysis of policy options for the beef sector in Botswana"

39. Climate impacts can also affect private-sector actors in the livestock value chain. For example, the drought in 2018-2019 in Ngamiland forced the closures of numerous private abattoir and butchery facilities that did not have sufficient water for their operations. This affected game-processing facilities as well as livestock processing facilities which left local retailers and the tourism sector importing meat from South Africa for their business survival. Climate change-induced disruptions resulting from legislated market closures related to FMD outbreaks and more recent operational closures in times of drought-induced water scarcity affect economic viability and reflect the interconnectedness of rangeland health, economic health, and regional climate security.

The Botswana beef value chain map (2010)



Export Facility	Location, Project Area	Status
Ngamiland Abattoir	Maun, Ngamiland	Operational, exporting to Democratic Republic of Congo (DRC) slaughtering high-quality animals for tourism market
Batawana Beef	Maun, Ngamiland	Operational, local market, tourism facilities and exporting to DRC
Tati Beef	Francistown, near Bobirwa	Operational (export status unknown)
Tshabong Meat	Tshabong, Kgalagadi	Export facility for small stock, under construction
Multi-species Abattoir Botswana	Gaborone	Status unknown

Figure 13: Depiction of red meat value chain in Botswana where medium to large commercial farmers (2,800 in number) utilize a feedlot to add weight and fat before sale and transportation agents are used to facilitate movement of large numbers of animals in a single sale. Smaller, communal farmers do not have access to feedlots and sell to the Botswana Meat Commission (BMC) or other buyers at infrequent and unpredictable times. In Ngamiland, the BMC abattoir does pay higher prices for animals >180 kg (carcass weight), but farmers receive payment, on average, 6-9 months after the sale, limiting the use of such a sale for climate adaptation purposes (e.g. offtake during climate stress) (see Feasibility Study, Section 5, Appendix 5.2). Unfortunately, in 2019, BMC was not operational as privatization plans were being developed and its future is uncertain. A communal farmer may also choose to sell to a local butcher or new private abattoirs who pay less but have better payment terms (<3 months) or into the informal market for animals for traditional ceremonies. This latter market was severely impacted in 2018 when Botswana banned “under the tree slaughters”, making this direct farmer to consumer option no longer legal.¹²⁷ A table of currently operational export abattoirs in Botswana is also included.

40. Manure management, water savings technologies, and transition to renewable energy are key opportunities that can reduce Botswana’s livestock-product value chains vulnerability to climate change whilst also reducing GHG emissions¹²⁸. However, consultations during Funding Proposal development with local operators indicated that financial policy incentives are required to expedite adoption and build climate-resilience for this key national economic sector.

Contribution of Project to GHG Emissions Reductions

41. Across the Project regions, households own over 320,000 cattle that produce more than 600,000 tCO_{2e} per year. Using MoA records on breeds and herd structure, a baseline tCO_{2e} per year was calculated using the IPCC Tier 2 methodologies and is shown in Table 7 below. It is important to note that Botswana’s GHG Inventories for Biennial Update Report, First Biennial Update Report, and Third National Communication to the UNFCCC all based their accounting of the emissions from the livestock sector on the IPCC Tier 1 approach. However, an identified national objective is updating Botswana’s inventory to the Tier 2 approach as recommended in each of these reports. This Project represents an opportunity to build an evidence foundation for the updated national livestock emissions inventory. The default cattle methane emissions factor from enteric fermentation applied under Botswana’s Tier 1 inventory (32–38 kgCH₄/head/year) represents the commercialized sector for all of Africa and the Middle East and the IPCC guidelines recommend the Tier 2 method for countries with large livestock populations, such as Botswana. It is expected that the poor fodder quality available to livestock on communal land and significant energy requirements to acquire feed over large grazing areas compared with the commercial sector considerably increases the livestock emissions intensity. This is reflected in the greater baseline annual methane emission rate per head of cattle under the Tier 2 inventory (80–83 kgCH₄/head/year). The opportunity exists to halve the enteric fermentation emissions rate through the Project’s improved management practices.

¹²⁷ FAO 2010. Botswana Beef Value Chain Study;

https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Agricultural%20Economic%20Fact%20Sheet_Pretoria_Botswana_6-9-2015.pdf

¹²⁸ Current situation and plausible future scenarios for livestock management systems under climate change in Africa. <https://cgspage.cgiar.org/bitstream/handle/10568/108139/http://WP307.pdf>

Table 7: Baseline livestock enteric fermentation CO₂e rates for the three Project areas using IPCC Tier 2¹²⁹

Project area	Livestock unit population (head) ¹³⁰	Baseline (tCO ₂ e/year)
Bobirwa	62,769	130,648
Ngamiland	190,189	385,364
Kgalagadi	69,395	143,161
Total	322,353	659,173

42. Conserving and restoring rangelands¹³¹ have direct emission reduction benefits by increasing vegetation and soil carbon sequestration. The mitigation potential is calculated¹³² (see Annex 2 Feasibility Assessment, Section 3) and presented in Table 8 for the Project period. Table 5 shows the value of healthy rangeland ecosystems and the role they can play in emissions reduction strategies over the long term.

Table 8: Baseline rangeland carbon stocks (soil - top 15 cm) for Bobirwa, Ngamiland and Kgalagadi.

Variable	Unit	Bobirwa	Ngamiland	Kgalagadi
Vegetative Carbon	tCO ₂ e/ha	309.0	267.5	140.9
Soil Carbon	tCO ₂ e/ha in 0-15 cm	4,044	4,470	2,143

43. The Project will reduce GHG emissions through both reducing enteric emissions from livestock by improving fodder quality and sequester additional CO₂ from less degraded rangelands. The projected emissions reductions are presented below in Figures 14, 15, and in Tables 9 and 10. Note that conservative estimates are used, which assume 80% effectiveness / uptake for both rangelands and livestock management. This assumption means that of the targeted 4.6M ha, ~3.7M ha will come under improved management; and that 80% of the targeted livestock will be included in Rangeland Stewardship Agreements and have improved fodder and reduced enteric emissions. In addition, Project livestock emissions reductions are conservatively only calculated for cattle, small stock (goats, sheep) are not included.

Table 9: Projected Project Emissions Reductions¹³³

Period	Cumulative (tCO ₂ e)			Annual (tCO ₂ e/yr)		
	Soil	Livestock	Total	Soil	Livestock	Total
Year 4	681 340	116 090	797 430	170 335	29 023	199 358
Year 8	4 168 840	534 658	4 703 498	521 105	66 832	587 937
Year 10	6 466 724	794 351	7 261 075	646 672	79 435	726 107
Year 20	18 935 574	2 577 525	21 513 100	946 779	128 876	1 075 655

¹²⁹ See Annex 2 Feasibility Assessment Section 3, Carbon and Water Baseline, and Annex 22 GHG ER calculations.

¹³⁰ Includes all ruminants (cows, goats, sheep) in the Project area standardized to a livestock units (2015).

¹³¹ Defined as actions that increase the abundance of palatable, digestible grass species, and increase grass cover in the Project areas.

¹³² See Annex 2, Feasibility Assessment, Section 3 Carbon and Water Baseline

¹³³ See Feasibility Study Section 3 and associated appendices 3.3 (ecosystem emissions calculations) and 3.5 (livestock emissions calculations)

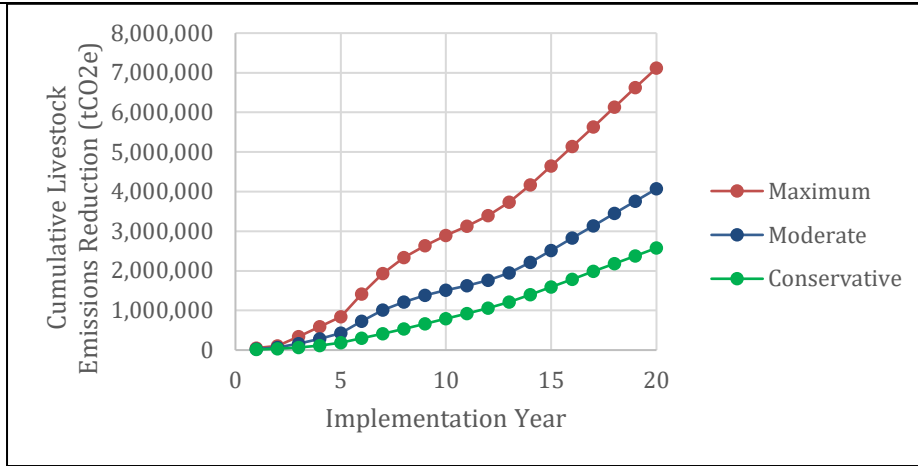


Figure 14: Mitigation potential (tCO₂e) from livestock enteric fermentation in the Project areas. The Project is using the Conservative estimate (80% uptake in 104 villages) for mitigation projections. The scenarios vary by speed and % uptake¹³⁴.

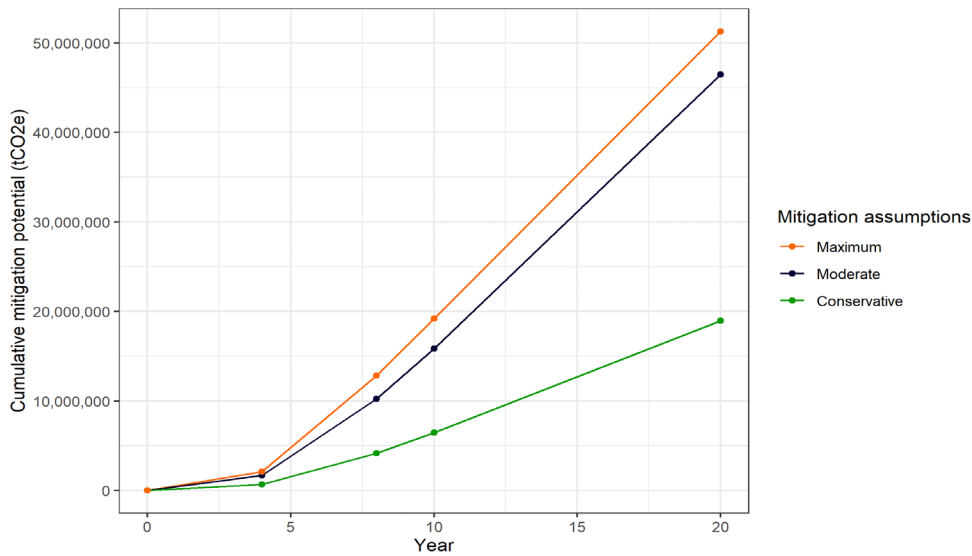


Figure 15: Increased sequestration potential from improved rangelands management. The Project is using the Conservative scenario to estimate mitigation potential – scenarios vary by level of degradation reduced/reversed, and the speed that restoration takes place¹³⁵.

Table 10: Geographic breakdown of cumulative mitigation potential (tCO₂e) across three Project areas

Project Area	Source	4-year	8-year	10-year	20-year
Bobirwa	Enteric fermentation	16,744	77,114	114,570	371,758
	Soil carbon stocks	98,270	601,275	932,701	2,731,092
	Total	115,014	678,389	1,047,270	3,102,851
Ngamiland	Enteric fermentation	61,394	282,752	420,089	1,363,114
	Soil carbon stocks	360,324	2,204,675	3,419,902	10,014,006
	Total	421,718	2,487,427	3,839,992	11,377,120
Kgalagadi	Enteric fermentation	37,953	174,792	259,692	842,653
	Soil carbon stocks	222,746	1,362,890	2,114,121	6,190,476
	Total	260,698	1,537,682	2,373,813	7,033,129
Grand Total		797,430	4,703,498	7,261,075	21,513,100

¹³⁴ Feasibility Study Section 3 appendix 3.5

¹³⁵ Feasibility Study Section 3 appendix 3.3

44. The proposed Project is designed to transform current rangeland management in Botswana to collectively build the resilience of rangeland ecosystems and the communities whose livelihoods are threatened by climate change. Rangeland practices that regenerate healthy ecosystems that sequester carbon¹³⁶ and build resilience to extreme climatic events have been successfully tested in other parts of southern Africa^{137,138} but have not yet been adopted at scale in Botswana.

45. The Project will apply proven restoration techniques aimed at reversing degradation that leads to reduced adaptive capacity for ecosystems, negative livelihoods impacts, and increased GHG emissions (Table 11.) An important consequence of managed herd movement is that greater ground cover by plants and leaf litter traps rainwater where it falls and increases water infiltration into the soil, promoting root growth. A deeper and more extensive root system will generate greater resilience to drought and higher infiltration rates reduce overland water movement and associated erosion and flooding risks. Using these fundamental ecological principles, specific activities will be designed and implemented based on individual site assessments of ecosystem characteristics, vulnerabilities, and the most likely climate hazards for a particular site.

Table 11: Restoration techniques used to combat impacts of climate change in targeted rangelands (for more information and images of restoration techniques, please see Feasibility Study Section 4)

Restoration Technique	Climate Induced Degradation Impact	Description	N	K	B
Ponding	Bare ground/sheet erosion	This method involves making hollows for water collection across the soil surface and can be cut by hand using a pick and shovel. This method is suitable for capped areas that are not too extensive in size. The excavated soil is piled from a low berm on the down-slope. It is suitable to reduce/reverse degradation in areas exposed to intense rainfall events.	X	X	X
Restoration mats	Bare ground/sheet erosion	Mats of loose-tied wood shavings held together with natural twines are secured into areas of heavy compaction and sheet erosion. Animals are prevented from grazing in the area and re-seeding is facilitated through broadcast seeding of natural species or left for natural re-seeding if a source area is available. Animals are strategically herded onto the mats over time to expedite regrowth and natural ecosystem functioning. This technique is suitable to reduce/reverse degradation in areas exposed to intense rainfall events and drought. It is less cost effective in areas with limited precipitation or slow-growing vegetation. (see photo below this table)	X		X
Restoration boxes	Bare ground/sheet erosion/Ecologically devastated areas	Designed for arid systems where ecology is based on patch dynamics and broadcast; and where livestock-based seeding fails to create nurse-plant effects that enable natural regeneration. Also critical in areas where regenerating seedlings require extra protection from wind. Will be created with enterprise development beneficiaries.		X	
Livestock bioturbation	Bare ground/sheet erosion	Use of Ecorangers to implement herding techniques that move cattle in a circle on bare patches to break hard-pan soil crusts and concentrate nutrients from livestock waste and dung that enable seed and water infiltration for grass regeneration. Suitable for catalyzing restoration and maintenance in areas and times when moisture is present for natural regeneration.	X		X

¹³⁶ FAO (2009) Review of evidence on drylands pastoral systems and climate change: Implications and Opportunities for Mitigation and Adaptation.

¹³⁷ Rust, JM, and T.Rust. Climate change and Livestock Production: A review with a focus on Africa. South African Journal of Animal Science 2013, 43 (No. 3)

¹³⁸ Muller et al, 2020 Building resilience in rangelands through a natural resource management model: a case study of Ecosystem-based Approaches to Adaptation. IIED. <https://pubs.iied.org/G04444/>

Natural material weirs	Minor gully erosion	Biomass is also used for assisting with stabilizing erosion nickpoints, incised footpaths and small gullies, to assist with sediment accumulation. Small contour lines and log steps are anchored with sharpened droppers selected from the felled biomass of bush-thinning efforts. This technique is critical in areas exposed to intense rainfall events, particularly close to wetland and riparian areas where sedimentation of water sources for human and livestock is a risk.	X	X	X
Stone weirs and restoration mats	Major gully erosion	In areas of more severe erosion, a combination of restoration mats and stone weirs can be used to slow water flow and catalyze vegetation regeneration. This technique is useful in areas exposed to intense rainfall events on flatter land surfaces with erodible soils.	X	X	X
Livestock Herding/ Corraling/Feeding for Re-seeding	Unpalatable species dominance/increase	Use of Ecorangers to manage seasonal timing of grazing and rest periods to enable propagation of palatable grass seeds and to negatively affect life cycles of early growing unpalatable species. This technique is useful in normal rain seasons/good rain periods in degraded lands to encourage natural regeneration.	X	X	X
Livestock Herding/ Corraling	Wetland/Riparian degradation/Encroachment into Wildlife Dispersal Areas	Use of Ecorangers to manage geographic zones for grazing and water infrastructure to avoid degradation and allow for regeneration of wetland and riparian areas and maintenance of wildlife dispersal areas. This technique is useful for reducing loss of livestock and livestock-wildlife conflict in times of drought.	X	X	X
Bush-thinning and hand-pulling	Bush encroachment (unnatural spread of native species)	Bush-thinning involves removal of lower branches of encroaching species (e.g., <i>Acacia mellifera</i>). This maintains the canopy for shade and soil protection but enables animal movement into the area to break up dense vegetation and creating usable grazing areas. Thinned material is strategically placed to facilitate regeneration or used in the creation of bush-fodder for supplementary livestock feeding in a more digestible form based on the chemistry of the bush species. This technique is useful for maintaining shade cover and reducing grazing pressure on grassland areas during extreme heat cycles.	X	X	X
Physical removal on best practice techniques for the IAP (South Africa IAP removal norms and standards)	Invasive alien plant (IAP) spread	Manual cutting using hand tools (loppers, bush knives, axes and bowsaws). Hand pulling of small growth <50mm where possible (using gloves and small anchor pullers /tree poppers) to remove roots, avoiding use of herbicides. This is a critical restoration process for restoring natural water balance and drought resilience by removing water thirsty IAPs (e.g., <i>Prosopis glandulosa</i>), particularly from riparian areas.	X	X	X
Strategic fire breaks		Brush-thinning through manual techniques and strategic grazing, particularly concentrating small stock, to graze strategic fire breaks based on prevailing winds to prevent runaway fires. This is critical in areas where climate change leads to increased consecutive dry days, higher temperatures, and stronger winds.	X	X	X



Example of impact of the restoration mat treatment after one year on the right half of the photo (left half untreated). The treatment was in an erosion gully and the river is at the tree line. As the brush decays after 1-3 years, Ecorangers can herd animals into grazing the green flush, trample seeds, and concentrate manure that leads to long-term re-establishment of healthy root/shoot ratios for perennial grasses. For images of other restoration practices please see Annex 2, Feasibility Study, Section 4.

46. To complement and protect restored areas, the Project will expand application and professionalise traditional herding practices that reduce ecosystem degradation, reduce fire impacts, reduce livestock disease risk, and mimic the natural grazing cycles of native wildlife to ensure the maintenance of a paradigm shift to climate-resilient livestock production on resilient, healthy rangelands.
47. While the restoration activities during the Project will directly reduce the climate vulnerability of these areas, these activities will also empower farmers to understand and use restoration and regenerative grazing strategies to ensure their climate resilience in the future. The Farmer Facilitation Teams, which make up 1/3 of total Project staff, will be trained and supported not only to transfer technical know-how but also to transfer core adaptation skills of goal setting; conflict resolution; communications; and adaptive management through the annual delivery cycles of RSAs.
48. The long-term success of the Project will be ensured by integrating climate change interventions into government job creation and economic development strategies. Botswana's currently expends US\$65 million per annum on the *Ipelegeng* public employment programme that has been in place for the last three decades to provide temporary wages to its population's "most vulnerable" by engaging them in work for public benefit. Given high unemployment levels, government revenue projections, and the known high cost of emergency relief, the government will sustain Project interventions, including staffing and O&M, in the project areas and replicate it in other communal area regions of the country as part of the ongoing investment in the institutional infrastructure as part of a new strategy for *Ipelegeng*. The Project will also inject momentum, innovation, and inclusivity of last-mile communities into the government's National Grassfed Beef Strategy adopted by the Ministry of Agricultural Development and Food Security in 2020.
49. In addition to government investment, the project will leverage private sector support to Project sustainability by building market-readiness capacity, facilitating access to markets that have previously been closed to communal farmers by enabling application of best practice guidelines from the Food and Agriculture Organization of the United Nations (FAO) on implementation of commodity-based trade (CBT) standards of the World Organization for Animal Health (OIE)¹³⁹ in communal land context, advancing the establishment of local-level rangeland stewardship funds, and promoting new climate awareness in Botswana's value chain and marketing strategies.

Contribution of Project to Environmental and Local Socio-Economic Co-benefits

¹³⁹ Former Office International des Epizooties – kept its historical acronym OIE

- 50.** Research conducted in the Kgalagadi District revealed that communal grazing provides the widest range of ecosystem services as compared with other land uses¹⁴⁰. Improvement in rangeland condition is likely to result in improved water provision and regulation in the Project area water sources which will benefit wildlife, livestock, and village populations¹⁴¹. Other potential positive outcomes for flora and fauna diversity and carbon sequestration may emerge from the co-existence strategies promoted by the Project^{142,143}. CI and Project partners will measure the impact on these environmental indicators to understand the contribution to such co-benefits and to inform policy and practice recommendations for integrated wildlife-livestock systems in the future.
- 51.** In addition to building economic climate resilience of the Project area populations, the Project will protect the environmental assets upon which the broader economy is based. Tourism and livestock product value chains are more negatively impacted in the Project-targeted interface areas where communal farming takes place in areas where either tourism or commercial beef farming exist. For additional context, tourism concession areas are purely managed for wildlife and commercial farms are located further away from wildlife geographically or separated by government-maintained fences. Communal grazing lands are primarily located between tourism and commercial areas - which means communal areas are impacted by wildlife coming from tourism areas and eating communal farmers' animals or fodder resources, and commercial farmers supplement their fodder from communal lands during times of climate stress. The Project will focus on the most vulnerable populations in the Project-targeted areas that are dependent on farming but have no access to the more abundant resources found on private commercial lands or in tourism concession areas. It is also anticipated that improved rangeland health outside of current ecotourism areas will protect Botswana's national reputation as a premier nature tourism destination and protect national tourism-based economic activity and employment. Similarly, the Project has the potential to bring commercial farmers and their grazing lands into larger rangeland stewardship efforts, improving and enhancing the climate resilience of their contribution to national value chains and export economy.
- 52.** The current inability of communal farmers to comply with formal trade regulations results in more than 250,000 animals in the Project areas grazing, causing degradation, increasing disease risk, and increasing national emissions while contributing nothing to the formal economy, with only illegal and high-risk slaughters supporting rural food-security. The Project interventions aimed at maladaptive livestock management practices will convert this national liability into assets that support the broader socio-economic status of the nation.

Project Alignment with Past, Present, and Future Interventions:

- 53.** Significant investments are being made through public expenditure and donor-funded initiatives to increase the resilience of Botswana's agriculture sector to the impacts of climate change and to expand sustainable development opportunities. Lessons learned and best

¹⁴⁰ Favretto, N, Stringer, L C, et al., "Assessing the Socio-Economic and Environmental Dimensions of Land Degradation: A Case Study of Botswana's Kalahari," 2014, 1–28, <http://www.see.leeds.ac.uk/research/sri/eld/>.

¹⁴¹ See Annex 4: Carbon and Water Baseline Assessment for additional details

¹⁴² Keesing et al, 2018 Consequences of integrating livestock and wildlife in an African savannah. Nature Sustainability. Available at: <https://doi.org/10.1038/s41893-018-0149-2>

¹⁴³ Sitters et al. 2020. Effects of cattle and megaherbivores on soil carbon and nutrient pools. Nature Sustainability. Available at: <https://doi.org/10.1038/s41893-020-0490-0>

practices from these interventions are incorporated into the design of the proposed Project to replicate successful adaptation techniques and ensure that there is complementarity between the Project and existing and proposed activities in Botswana¹⁴⁴.

- 54.** The Project will scale pilots of the Southern African Herding for Health model undertaken in sites across five SADC countries, including Botswana. The Project will build on the Herding for Health partner work by CLAWS and Botswana Predator Conservation Trust/Habu Elephant Development Trust foundational work, as well as interventions seeking to broker new wildlife-livestock co-existence models supported by the GEF in the Kgalagadi, and Peace Parks Foundation in the Northern Tuli block of Bobirwa. The Project will also provide an opportunity for testing new regional good practice guidelines for sustainable rangeland management published by the World Bank in 2019¹⁴⁵. These guidelines are a consolidation of experience from over 100 researchers and practitioners in the region. By building these interventions into a network of demonstration sites, the GCF investment will replicate and expand impact, deepen learning from implementation, and provide a model for national transformation that supports tangible and measurable increase in landscape and livelihood resilience to the impacts of climate change.
- 55.** The Project builds on a foundation of prior initiatives and capitalizes on and coordinates with ongoing work in Botswana. Specifically, the project Rangeland Stewardship Portal will be integrated with the Land-use Conflict Information System (LUCIS) system that was developed by the USAID SAREP Programme and is being mainstreamed by target district and national authorities by UNDP. Key projects implemented previously in Botswana, include the ASSAR Adaptation at Scale Botswana Programme, and the GEF/UNDP Mainstreaming Sustainable Land Management in Rangeland Areas of Ngamiland-District Landscapes for Improved Livelihoods have provided a crucial base of awareness and experience in the Bobirwa and Ngamiland areas and this Project will incorporate recommendations of both of these projects - particularly that longer timeframes are required to realize behaviour change and embedding climate adaptation into sustainable use of rangelands. Additionally, through the introduction of *Ipelegeng* support, the Project will deliver a solution to these projects' identified problem of lack of skilled herders to implement good livestock management practices.
- 56.** Herding for Health and Botswana's Department of Veterinary Services (DVS) are working with the AHEAD program (Cornell University) to develop Commodity Based Trade (CBT) in Botswana, but this program does not incorporate the impacts of climate change on CBT issues, a significant gap in the approach. This Project will work with the AHEAD program to include CBT interventions that address the increased threats to trade systems and productivity posed by climate change and will design and deploy systems to enable CBT implementation in Botswana's communal lands¹⁴⁶.
- 57.** Current initiatives such as the International Savannah Fire Initiative, GEF Kgalagadi Programme, and FAO efforts to upgrade the Botswana Range Inventory and Management Project (BRIMP) projects provide important engagement, lessons, and data that are critical to the current project's success. These initiatives are transformational by shifting agricultural development pathways toward greater resilience, and this Project will build on and

¹⁴⁴ A comprehensive list of baseline Projects, programmes and initiatives as well as details of their focus and alignment with the proposed Project is presented in Annex 2: Feasibility Study Section 4.

¹⁴⁵ Available at <https://www.wocat.net/library/media/174/>

¹⁴⁶ Guidelines on Commodity-Based Trade Approaches for Managing Foot and Mouth Disease Risk in Beef in Southern Africa 3rd Edition, Animal & Human Health for the Environment And Development (AHEAD)

coordinate with their implementation to sustain Project achievements in reducing climate risks for communal farmers in perpetuity.

- 58.** Analysis of Botswana's current drought and water management systems show that the historic and current systems are extremely limited. Botswana's MET is in the process of increasing its weather monitoring capacity with support from external and internal sources - the Project will participate in activities by government to ensure linkages with new predictive capacity between the rangeland management portal and planning processes (e.g., into a sustainable monitoring and adaptive management system).
- 59.** Three multilateral and bilateral investments will catalyse complementary projects that will support the delivery and sustainability of the GCF Project.¹⁴⁷ FAO will invest in rangeland degradation mapping in Botswana, which will be integrated into the Project's Rangeland Stewardship Information Portal as a reference for Village Grazing Area baseline assessments and Project impact evaluation efforts. An EU grant to CI and partners will finalise commodity-based trade beef production protocols for Botswana's DVS, which will facilitate the opening of trade in meat between Botswana and the EU, including meat originating from the Project sites. A regional investment in replicating the Herding for Health model by the French Development Agency (AFD) includes financing that can be channelled to SMEs that purchase livestock from farmers who are parties to an RSA. Herding for Health data and approaches will be shared between these broader national and regional initiatives and the Project to ensure complementarity and to advance opportunities for mutual learning and replication.
- 60.** In late 2019, the Government of Botswana and UNDP (AE) submitted a Concept Note to the GCF titled, "*Building climate resilience of agricultural systems in the North-East and Central districts of Botswana*". Working in alignment with this GCF Project, the key proposed outcomes are: 1) strengthening the institutional capacity of the MoA, Ministry of Environment, Wildlife and Tourism (MEWT), district officers and farmer organisations for climate-responsive planning; 2) providing farmers with access to climate-resilient agricultural inputs, technologies and practices and unlocking dedicated loan finance from national development banks; and 3) improving the access of small-scale crop farmers to adequate climate information systems to inform short, medium, and long-term planning. This UNDP-proposed GCF project focuses on different geographic areas in Botswana, and a variety of opportunities for collaboration will be explored.
- 61.** This proposed GCF Project will also benefit from outcomes of the UNDP Concept Note through incorporation of genetic and technological innovations for crop-based and commercial livestock production developed and deployed through the UNDP project. The CI Project will also capitalize on opportunities for loan finance from the Botswana National Development Bank developed by the UNDP GCF project. Similarly, GIZ with SADC is developing a GCF proposal that will include capacity building activities in climate smart agricultural initiatives. This CI Project will generate important case studies for the platforms and policy recommendations emanating from the SADC project.

B.2. Theory of change

Problem Statement

62. Climate change is contributing significantly to the degradation of Botswana's rangelands, resulting in reduced forage quality and quantity that reduce soil carbon sequestration potential. Poor livestock farming areas in rangelands under communal land tenure are experiencing economic insecurity and an increasing loss in their livestock assets due to: 1) direct impacts of climate change, temperature increases and extreme drought and flood events; 2) resulting impacts on fodder and water resources, increased degradation of livestock condition and increased livestock emissions; and 3) associated impacts of increased wildlife-livestock predation and disease transmission as livestock, wildlife, and humans compete for scarcer water and fodder resources in harsher climatic conditions. Unless innovative, gender responsive, and culturally-based climate resilient approaches are adopted by livestock farming communities, climate change will devastate the livelihoods of poor farming households, increase degradation of Botswana's ecosystems, and perpetuate current higher-emissions communal livestock production systems. Extensive consultations with stakeholders across the Project areas indicate that the current lack of structures, capacity, and incentives to improve livestock and rangeland productivity in the face of climate change will result in devastating impacts on Botswana's agriculture and tourism sectors, exacerbating high vulnerability to climate change impacts in target communities¹⁴⁸. Without a rapid transition to a new paradigm, degradation will worsen, populations' resilience will decrease, and emissions from the communal livestock sector and reduced soil sequestration potential will continue as rangelands degrade due to higher temperatures, more frequent droughts, and associated bush encroachment.

Current Paradigm

The Project aims to shift the current paradigm where:

- Climate change is exacerbating degradation of rangeland ecosystems - reducing these regions' carbon storage capacity and increasing livestock-based emissions. Future climate impacts including extreme droughts will be more severe in the future, leading to further ecosystem degradation and reduced carbon sequestration potential;
- Botswana's traditional livestock system, where herder-controlled seasonal livestock movement according to climate allowed for rangeland rest and recovery and wildlife co-existence, has been widely abandoned. Combined with climate change degraded rangelands, negligent management increases impact of climate hazards through loss of livestock to starvation, lack of water, disease, and predation;
- There is low economic resilience in marginal wildlife areas where ecotourism is not viable and there is no opportunity to offtake livestock into formal markets due to FMD legislation and poor traceability of communal livestock;

¹⁴⁸ Annex 7: Stakeholder consultation summary

- Rural populations most vulnerable to the impacts of climate change adopt coping strategies that are detrimental to human well-being (e.g., sex-work and sacrificing family nutrition to maintain fodder and water for livestock) and ecosystems (e.g., further degradation of rangelands and reduced sequestration capacity, movement into wildlife management areas, illegal poaching);
- Government and investor requirements for livestock production exacerbate vulnerability for rural communities and local economies by preventing income generation and low-emission opportunities and encouraging value-chains based on geographically fenced zones and ranches that prevent large scale movements required for wildlife and livestock to adapt to new climate situations.

The Project's theory of change expressly addresses the current paradigm through the proposed Project components:

- 1) Strengthening institutions and support systems for climate-responsive planning and management (Component 1);
- 2) Reducing GHG emissions and negative livelihood impacts through new job deployment in rangeland rehabilitation, improved livestock management, and climate impact monitoring. (Component 2);
- 3) Promoting climate-sensitive enterprise development and value-chain investments to sustain transformational change (Component 3).

Desired Paradigm:

63. The project's primary goals are to improve the adaptive capacity of vulnerable households and maximize land and livestock mitigation contributions to emissions reductions by:
- Improving governance and information availability for decision making on climate-responsive grazing plans that improve ecosystem productivity;
 - Improving fodder and water resources in designated village grazing areas by deploying *lpelegeng* investments to fund the salaries of "Ecorangers" and "restoration workers" that are trained and employed for a six-year period (as opposed to the current *lpelegeng* system of part-time employment for a few months with no skill or outcome targets);
 - Institutionalizing communal adaptive management of five aspects required for climate resilient livestock production system (herd movement, herd health, herd composition, record-keeping, and off-take); and
 - Rewarding collective action that leads to improved ecosystem health by unlocking market access and enterprise development opportunities, and by building industry awareness and consumer demand for regenerative livestock products in a way that measurably increases income security for vulnerable farming households and sustains low-emissions production systems.

64. The Project will move Botswana to a climate resilient, low-emission sustainable development paradigm where:

- The government of Botswana's commitments to the SDGs, UNFCCC, and GDSA translate into aligned programmes and policies that empower community-level governance structures to develop and enforce climate-resilient communal grazing and water management strategies;
- Marginalised rural people are trained and employed as professional restoration workers and Ecorangers (professional herders) to draw on indigenous knowledge systems and utilize new technologies that restore and maintain rangeland ecosystem and livestock health and improve herd management for record-keeping and offtake;
- Farmers and their communities experience fewer losses of their economic assets to climate stresses and benefit from new land and livestock management practices;
- New market access channels and climate-resilience protocols build value-chain partnerships and local-level enterprise development (which may include natural fodder development, restoration enterprises, veterinary enterprises, hides, skins, and wool, as well as beef) and fund mechanisms that sustain healthy rangelands under climate change.

65. The theory of change diagram (Figure 16) illustrates how the Project will overcome key barriers to achieve its goals to reduce climate vulnerability and reduce emissions from rangeland degradation and livestock production in Botswana's communal rangelands through enabling and monitoring gender equitable governance, supporting climate-resilient livestock farming, and developing sustainable value chains.

Overcoming Barriers to Achieve Impact

66. The barriers to this paradigm shift are complex and stem from a range of obstacles that perpetuate climate vulnerability and high-emissions production systems including:

67. *Weak community awareness and governance mechanisms for designing and implementing climate responsive rangeland restoration and livestock production strategies.*

- Although farmer and community structures exist, and in some cases have overseen village grazing plans, currently livestock management decisions in the targeted communal lands are mostly created and implemented at the household level - leading to lack of recovery time for rangelands, overstocking, and poor animal health conditions. Private farmers also bring their herds to graze in communal lands, utilizing resources that could reduce vulnerability for those that do not own private dry season farm reserves¹⁴⁹. Lack of coordination with livestock owners who own private lands but still utilize communal lands, as well as poor technical capacity within Land Boards to guide management arrangements,

¹⁴⁹ Cullis, A and C. Watson (2005), "Winners and Losers: Privatizing the Commons of Botswana". IIED publications, available at <https://pubs.iied.org/>

exacerbate rangeland degradation and lower adaptation and mitigation capacities. Alternative strategies that employ an integrated, cross-sectoral approach are more appropriate to the observed context and climate change impacts (addressed in Output 1.1).

68. *Insufficient government resource allocation and coordination for governing communal rangelands and community adoption of climate-resilient livestock management strategies.*

- Government investments in job creation have not been deployed in communal rangeland restoration or climate change resilience, and the effectiveness of the Government's current approach to address poverty alleviation goals is questioned by stakeholders¹⁵⁰. Agricultural investments in communal lands have sought to expand privatization and reduce disease risks through fence-building to reduce degradation and support improved management of communal rangelands. This policy has not achieved desired results, due to the presence of migratory wildlife and the seasonal nature of nutritious rangeland conditions. Maintenance of fences also strains DVS budgets and human resources. For example, in Ngamiland, 10,000 km of fences require regular maintenance due to damage by livestock and wildlife, particularly elephants, as they move across areas following rainfall patterns that produce forage for their needs¹⁵¹. Communal farmers are not able to comply with animal disease management regulations due to lack of resources to hire herders and secure veterinary and traceability support (addressed in Output 1.2 and 1.4).

69. *Herding is not an attractive career and traditional knowledge of managing livestock, particularly in times of climate stress, is being lost.*

- Currently, negligence and poverty are responsible for a significant number of livestock losses. Despite the value (economic and cultural) of the assets entrusted to them, the herding profession is low paying, under-skilled, and unrecognized for the value it has historically added to climate-resilience. Most animals are not herded (Ngamiland) or herded by elders (Kgalagadi and Bobirwa) and the rich traditional knowledge of livestock-wildlife co-existence, maintenance of rangelands in times of drought, and supporting healthy livestock herds in times of heavy rains or rapid temperature changes is being lost. As a result, in the words of one interviewed youth, a career in restoration or herding simply isn't "sexy" due to lack of inclusion of technology and/or professionally recognised qualifications for the job (addressed in Output 1.3 and Output 2.1).

70. *Lack of spatially explicit information, analytical tools, and monitoring effort on climate, rangeland health, livestock management, and emissions reduction strategies.*

- Data that would be useful for developing Ecosystem-Based Adaptation (EbA) activities and adaptive management strategies are not accessible to farmers and decision-makers. Long-term trend monitoring and analysis that correlates climate, rangeland and livestock management practices on communal lands are non-existent. This lack of data prevents evidence-based decision making and accurate GHG Inventories and targets related to AFOLU at the macro and local levels (addressed in Output 1.4).

¹⁵⁰ Jongman, K (2018), "Sustainable livelihood and poverty eradication in Botswana", International Journal of Development and Sustainability, Vol 7 No4 pp1317-1324.

¹⁵¹ OIE PVS Evaluation Follow-up Mission Report of the Veterinary Services of Botswana (6 - 17 May 2019)

71. *Lack of policy-enabling platforms on climate-resilient rangeland and livestock management.*

- Community-based Natural Resource Management (NRM) policies have focused on tourism and hunting activities and excluded village livestock grazing areas, leaving these communal areas in an unclear regulatory environment and subject to the impacts of maladaptive management. Additionally, unlike other climate action forums such as climate-resilient agriculture (CCARDESA) and forest restoration (AFR100), national policy actors in Botswana have no peer networks for climate smart restoration and livestock management. This leads to delays uptake of lessons learned from other countries to improve policy and practice (addressed in Output 1.5).

72. *Investments aimed at reducing vulnerability of communal farmers is reactive rather than proactive.*

- Drought relief and price incentives to encourage sales (livestock offtake) from communal lands are only implemented after the official designation of a drought. The level of funding spent on drought relief by the government of Botswana over the last decades has increased significantly (see Figure 4 - drought declarations). Between July 2019 and June 2020, Botswana estimates spending more than US\$80M on programmes for social support to address impacts from the 2019 drought¹⁵². Government concentrating its efforts and resources on climate-disaster relief can be a barrier to innovation in investments in rangeland restoration labour that could prevent or mitigate the effects of droughts and floods (addressed in Output 1.5 and Output 2.1).

73. *Lack of scientific understanding of linkages between rangeland restoration, climate smart livestock production, GHG emission reductions, ecological impacts, and social co-benefits.*

- Productivity on rangelands is driven by complex factors and rangeland ecosystems are often driven by natural variability. The interaction between climate, ecology, economics, and cultures on rangelands is intricate¹⁵³, making it challenging for land users to predict the effect of land-use decisions. Poor monitoring of stocking rate, fire, and herbivore diversity prevents development of management systems that affect rangeland condition, health of livestock, water conservation, and amount of soil / vegetation carbon sequestration. This understanding is crucial for expanding carbon mitigation and adaptation potential from rangelands in Botswana and throughout Africa (Addressed in Outputs 1.4 and 2.2).

74. *Trade barriers for communal farmers exist and have detrimental impacts on livelihoods.*

- Geographic-zoning disease management approaches disincentivise good livestock management practices and exacerbate human-wildlife conflicts, and all farmers in a zone are penalised equally during disease outbreaks¹⁵⁴. A new national traceability system has become an additional barrier for rural farmers who are not able to access the internet-based system. Implementation of the new OIE Commodity-based Trade Standard could be rolled out in a way that further favours the existing commercial beef farmer and deepens the climate vulnerability of communal farmers (Addressed in Output 1.2, 1.4, and 3.2).

¹⁵² <https://www.mmegi.bw/index.php?aid=81912&dir=2019/july/26>

¹⁵³ See Carbon and Water Baseline in Annex 2, Feasibility Assessment Section 3

¹⁵⁴ AHEAD (2019) www.wcs-ahead.org

75. Lack of awareness and support for climate resilient livestock value chains.

- State and private sector actors involved in promoting the beef value chain either ignore or provide perverse incentives to communal farmers that fail to consider climate change, and as a result, exacerbate degradation through their financing and pricing strategies. Current pricing systems of the Botswana Meat Company, based on carcass weight, favor offtake of older animals from communal lands. However, climate-resilient herds will have a reduced number of unproductive animals, and export markets favor quality meat from younger animals. While numerous investments and support for ecotourism development in Botswana exist, diversified livelihoods are considered optimal by stakeholders as, even prior to COVID-19, tourism in Botswana was variable and susceptible to market trends. The recent lifting of Foot and Mouth Disease (FMD) barriers provides new, but underdeveloped, supply chain opportunities in communal areas as well as opportunities for increased safety in the processing of animals for local consumption. Increased food security interventions must be supported to ensure they serve last-mile communal farmers. (Addressed in Outputs 3.1 and 3.2).

76. The Project aims to overcome these barriers and realise its Theory of Change through eight pathways that are aimed at enabling beneficiaries to implement actions that permanently reverse rangeland degradation trends and improve livestock management on Botswana’s communal rangelands despite climate change; and sustaining these emissions-mitigating and EbA actions with income generated climate-resilient rangeland product value chains as presented in Table 12.

Table 12: Actions to combat impacts of climate change in targeted rangelands that will be the focus of the Project enabling pathways

Actions that improve climate-resilience and reduce GHG emissions in communal grazing lands	Actions that improve climate-resilience and reduce GHG emissions across rangeland product ¹⁵⁵ value chains
<ul style="list-style-type: none"> active ecological restoration management (erosion control, bush clearing, ponding, etc.— see Table 11), grazing and movement management that contributes to breaking soil crusts and concentrating manure in degraded areas as a restoration technique implementation of planned seasonal rest from grazing to allow for natural regeneration improving animal health and nutrition that leads to better digestion and reduced methane emissions removal of unproductive animals transition to more resilient livestock breeds 	<ul style="list-style-type: none"> enterprise development related to new rangeland management strategies (e.g., boma and Ecoranger base-station production, PPE production, restoration mat production, bush-fodder production, fodder gardens, etc.) strategic manure management from processing/quarantine sites into rangeland restoration/composting for emissions reduction adoption of water saving cleaning products and technologies (e.g., grey water recycling) transition to renewable energy sources for processing and refrigeration improved efficiencies in animal and product transportation management diversification into low-emissions businesses (carbon, game farming, and eco-agri-tourism) where desired by stakeholders and economically feasible

¹⁵⁵ Rangeland-product value chains targeted by the project may include natural fodder development, restoration enterprises, veterinary enterprises, hides, skins, and wool, game-farming, eco/agri-tourism, as well as beef. These will be selected with communities with the goal of promoting diversified and increased incomes in communal rangelands with marginal wildlife where ecotourism is not viable and yet, and as a result of the presence of wildlife, there is currently no opportunity to sell or manage commercial livestock due to FMD legislation.

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77. In combination, these Pathways create and sustain the conditions for the adaptation and mitigation impacts of rangeland restoration. Gender responsiveness and social equity are embedded in all these pathways; and open communication and science-based adaptive management underpin their delivery:
1. Building the capacity of communities to understand and formally agree to collective land and livestock management (training, mentorship, and legal support);
 2. Expanding the capacity of government to provide efficient and effective support to EbA in communal rangelands (human resources, technical and operational support);
 3. Providing marginalized individuals with new employment and self-development opportunities that reverse landscape degradation and unlock trade opportunities (new accredited training programme for herders, restoration workers, and graduate monitors);
 4. Enhancing access to information and analysis for adaptive management of rangeland systems (new IT system and user training);
 5. Contributing to an enabling policy environment (policy briefs and facilitating dialogues);
 6. Deploying a transformative human resource programme that enables climate resilient rangeland restoration and management and monitoring co-financed by the Botswana Ipelegeng Programme (Ecoranger, restoration worker, graduate monitor wages, and in-service training);
 7. Broadening community participation and sustaining benefits from climate-resilient livestock value-chains (training, financing partnership development support, local-level fund mechanisms);
 8. Facilitating financial policy and market shifts to expand rewards for climate-resilient livestock management and technology adoption (industry standards, private sector supply protocols, and consumer awareness/demand).
78. Through these actions, the following outcome-aligned results and co-benefits will be realised and contribute to the desired goal statement and paradigm shift:
- 1) **Component 1 results and co-benefits:** climate and rangeland information will be available and used by stakeholders to increase climate resilience and reduce GHG emissions; village-level targets and conditions for meeting commodity-based trade standard requirements for livestock trade and protecting ecotourism interests are established; data gathering and analysis enhances planning ability and knowledge of climate mitigation and adaptation impacts; national economic and agriculture policies and programmes support more inclusive sustainable development; regional and continental platforms share lessons learned for replication in similar communal rangeland areas.
 - 2) **Component 2 results and co-benefits:** Professional herders are trained and deployed in communal rangelands with re-deployed government funding for job creation and inclusive

last mile beef value-chain development; Improved rangeland management increases natural plant cover (decreased bare ground and bush encroachment, increases presence of palatable species that provides more resilient fodder resources for livestock-based livelihoods and increases water infiltration rates; soil and livestock health and management leads to 4.7M_{tco2eq} reduced GHG emissions; reduced livestock-wildlife conflict sustains ecosystem diversity (sustained wildlife populations) and protects farming and ecotourism-based livelihoods resulting in increased resilience for 247,000 people; record-keeping and improved livestock condition unlock new market access opportunities.

- 3) **Component 3 results and co-benefits:** Targeted vulnerable populations are better able to save and to cope with adverse conditions from changing climate; supply chains and businesses sustainably incentivize and sustain climate-resilient rangeland management and lower-emission livestock production through the purchase of sustainably produced livestock products from communal farming communities. National food security and economic well-being are improved, leading to long term resilience to climate change.

79. Several key assumptions are identified for this results chain and are provided below in Figure 16.

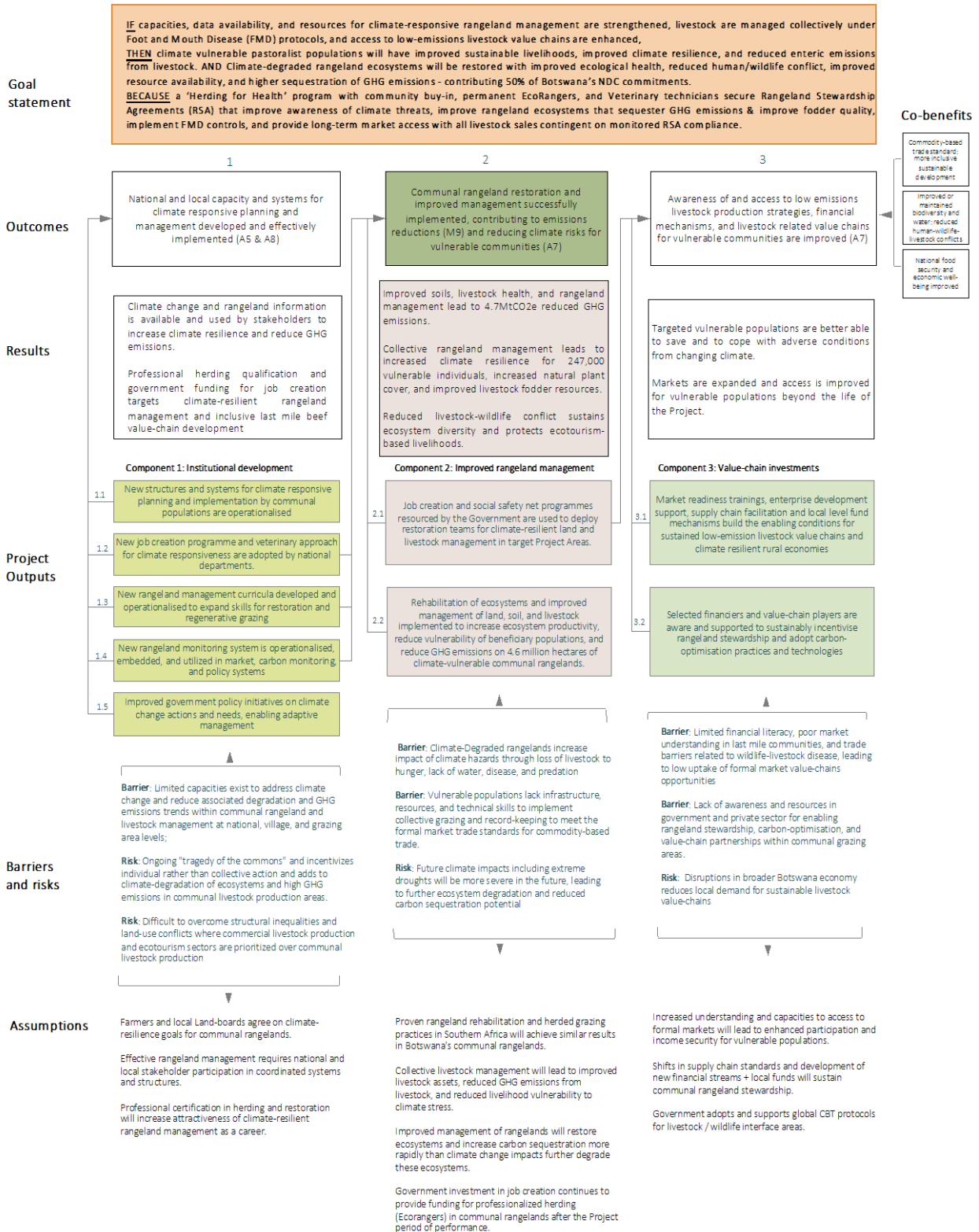


Figure 16. Project Theory of Change

B.3. Project/programme description

- 80.** The Project goals are to increase populations' resilience to climate change and reduce GHG emissions in Botswana's communal rangelands and livestock product value chains through enabling and monitoring gender equitable governance, climate-resilient livestock farming, and sustainable private sector development. Specifically aligned with the GCF Performance Management Framework, the Project will:
- Strengthen institutional and regulatory systems for climate-responsive planning and development (A5);
 - Strengthen adaptive capacity and reduced exposure to climate risks through innovative livestock production support, rangeland restoration, employment and career development, and enabling market transformation (A7);
 - Strengthen awareness of climate change threats and risk reduction processes (A8);
 - Improve land and livestock management in resilient multi-species (livestock and wildlife) ecosystems that contributes to emissions reductions (M9).
- 81.** The project approach is focused on capacity building at the individual, community, and institutional levels as the core mechanism to improve climate adaptation. This approach requires cohesive, intensive interventions that build links between people, communities, and institutions and creates an informed network that develops common experience, tools, and language that result in greater ability to respond to climate shocks. Based on organizational experience and lessons learned from similar programs, CI and project partners will deploy a large number of staff to engage with communities and institutions on an ongoing basis throughout Project implementation. This level of direct engagement is necessary to achieve the ambitious goals of the Project.

Project Phasing and Implementation Clusters

- 82.** The Project will be implemented over three distinct phases. In the Foundational Phase, tools and systems will be developed and tested at nine demonstration sites, selected based on their "readiness" (see Feasibility Assessment, Section 4 for more detail). Simultaneously, community level engagement for replication will begin for 2nd phase Priority Sites (Replication) to prepare for rangeland rehabilitation roll out in these sites, and during the third phase (Amplification) the Project activities will be implemented in all communities across the Project sub-districts. Private sector interest and sourcing from Project sites is expected to increase over the three Project implementation phases: Phase 1 will develop and test production and sourcing protocols from demonstration sites; Phase 2 will have low-to-moderate annual offtake of 500-1,000 animals per annum by two local abattoirs, as proof of concept demonstrates that rangeland and herd management translates into improved livestock condition and farmers begin to understand market systems; and Phase 3 will attract larger licensed abattoirs in the Project areas to source an increased quantity of animals, fetching higher prices as an incentive for compliance with RSAs.
- 83.** This Project timing, based on community consultations and the lessons learned from Herding for Health in South Africa, is realistic and allows adequate timing for engagement and capacity building to ensure the Project's success in creating transformational impact through demonstrated behaviour change. The final six months will provide a wrap-up period

to allow for documentation and transition to independent continuation of activities by farming communities and government agencies. Table 13 shows the Project phases and associated budget allocations, including co-finance:

Table 13: Summary of Project phases

Phase	Description	Timeframe	% of GCF Grant Funds	% of Full Project Budget ¹⁵⁶
I. Foundation	Team, tools, technology development and testing at demonstration sites, initial engagements at all priority sites	Years 1-2	18%	8%
II. Replication	Expand implementation support to priority sites, review and updating tools	Years 3-5	48%	35%
III. Amplification	Expand roll-out to all district village grazing areas, review and update tools, complete case study and policy documentation	Years 6-8	33%	56%
IV. Wrap up and lessons learned	Consolidation of all Project monitoring, reporting and close out	Q1-2, Year 9	1%	1%

- 84.** The Project implementation strategy is based on continuous workplan delivery and scaling within nine clusters across the three regions: four in Ngamiland with 55 Village Development Committees (VDCs), three in Kgalagadi with 34 VDCs and 2 in Bobirwa with 15 VDCs. All activities start at one demonstration site per cluster in the Foundation Phase, then grow to Priority Sites (highly vulnerable communities identified in the Climate Vulnerability Assessment in Annex 2, Section 1) within that cluster in the Replication Phase, and in the final Amplification phase, extend to the remaining village grazing areas within the District. Figure 17 provides a map of provisional clusters that will be reviewed during year one for final selection.

¹⁵⁶ Estimate including indicative co-financing – significant co finance is expected to continue in Year 9, and beyond the life of the project.

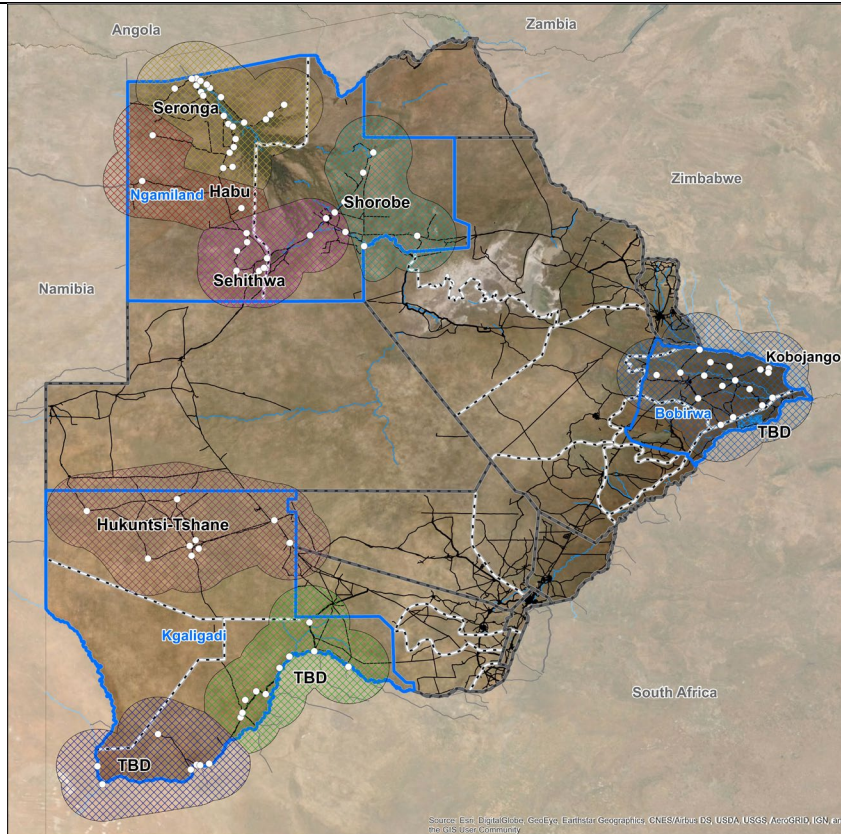


Figure 17. Initial mapping of Project clusters based on distribution of communal grazing lands and VDCs.

Component 1: Strengthening institutions and support systems for climate responsive planning and management.

- 85.** A review of relevant national policies and programmes, and consultation with stakeholders, revealed limited sectoral coordination, lack of mandated local management structures, overextended veterinary outreach, and an absence of integrated information systems to inform climate responsive planning on communal lands¹⁵⁷. These factors were found to compromise effectiveness of natural resource management and livelihood development on communal lands, exacerbating vulnerability to increased climate shocks. To address these shortcomings, the activities within this component aim to enable communities to make and enact climate-resilient decisions about their land and livestock management. Similarly, ensuring policy-makers are aware and using information from the Project to create an enabling environment is critical and provides an opportunity for the Project to influence national and regional stakeholders facing similar challenges of degraded rangelands, high unemployment, and increasing human-wildlife conflicts. This component is aligned with GCF Project outcomes: “Strengthened institutional and regulatory systems for climate-responsive planning and development (A5)” and “Strengthened awareness of climate threats and risk reduction”.
- 86.** Component 1 of the Project will facilitate alignment of decision-makers, support institutions through technical assistance, and develop tools that contribute to consistent and effective approaches to building new stewardship capacity for communal rangelands. This component is foundational for the Project and will be a primary focus for the first two years

¹⁵⁷ FS Section 4, Appendix 4.6 (Cassidy et al, 2018).

of Project implementation. The activities under this component contribute to the following outputs:

- 1.1 New gender equitable structures and systems for climate responsive planning and implementation by communal populations are operationalised;
- 1.2 New job creation programme and veterinary approach for climate responsiveness are adopted by national departments;
- 1.3 New rangeland management curricula developed and operationalised to expand skills for restoration and regenerative grazing;
- 1.4 New rangeland monitoring system is operationalised, embedded, and utilized in market, carbon monitoring, and policy systems;
- 1.5 Improved government policy initiatives on climate change actions and needs, enabling adaptive management.

Output 1.1. New gender equitable structures and systems for climate responsive planning and implementation by communal populations are operationalised.

Key Deliverable: Eighty percent (80%) of communal farming populations in target regions understand and are empowered in gender equitable VDCs, and/or Farmers Associations and Community Trusts to plan and govern collective land and livestock management.

87. Village Development Committees (VDCs) are the most local level of governance recognized by the State with a mandate to coordinate development activities and funding. As such, VDCs are the vehicle that determines the “public works” that will be prioritized for the government’s *Ipelegeng* Programme and make all applications to the government Livestock Management and Infrastructure Development (LIMID) programme. Unlike other structures, such as traditional councils, Village Development Committees also have legislated guidelines for selection and equitable representation and therefore are a natural vehicle to embed the Project activities to avoid duplication and enhance sustainability. However, the effectiveness (and representativity) of the VDCs in the project sites ranges greatly and stakeholders’ desire for the Project to strengthen these committees was a common feature across all consultations. CI is aware of the risk of “elite-capture” even in these representative structures, and regular and broad community engagements and capacity-development are part of the project design to address this risk. Additionally, several actions recommended in the ESMP (Annex 6) and GAP (Annex 8) to structure engagements, staffing, and capacity-building activities within this output are aimed at ensuring inclusivity, gender-equity, and leadership accountability. It is possible, and even probable, that the Environmental and Social Safeguards will not be able to be fully implemented in some communities due to the complexities of community power dynamics. In these cases, the Project will engage other functional local structures to achieve the outcomes as social dynamic fluctuations may shift during or after the Project period to allow for adoption at the VDC level. Utilising the experiences, methods, and tools developed in the demonstration sites, the Project team and Farmer Facilitators will scale their efforts to priority Village Grazing Areas - with an estimated 44 VDCs reached by year 3; and 104 by year 6. The target outcome is 80% of all 104 VDCs are engaged in active Rangeland

Stewardship Agreements by the end of the Project. This target recognises the risks, presented in FP Section D, of internal stakeholder conflicts, which may prevent 100% uptake. The VDCs, Land Boards, and CI will be main parties entering into each RSA. The VDCs and Land Boards have the capacity to enter into such agreements. Other entities, specific for each site, may be included in the agreement, including those involved in providing (e.g., other government entities or NGOs) or receiving assistance for implementation (e.g., a farmers' association, local NGO managing the Grazing support Package on behalf of a farmers' association, or individual farmers)."

Activity 1.1.1. Train a network of at least nine Farmer Facilitator Teams (Project staff, government extension workers, NGO partner field staff, mentor farmers, and unemployed graduate monitors) to understand climate-resilient grazing practices and be able to mobilise collective regenerative grazing agreements.

88. CI will train and support a network of individual representatives from state and NGO bodies as well as appointed graduate monitors to form Farmer Facilitation Teams, who are skilled using the principles of Free, Prior, and Informed Consent (FPIC) in promoting land-user behaviour change models and in developing annual plans that result in climate-appropriate and gender sensitive rehabilitation and grazing methods¹⁵⁸. The approach aims to empower local field agents, integrate traditional knowledge, align messages, and expose young professionals to the experience of a real-life impact programme. While government, farmer, and NGO representatives will be consistent over the life of the Project, new graduate monitors will be included in the Project every three years to optimise programme impact on young professional development in a way that is aligned with National Development Plan goals around youth development and employment. Other NGO partner staff, and relevant local officials who will be trained and coordinated as part of the FFT will not utilize GCF funding and their involvement in the FFT will be guided by an MOU.
89. Mentor farmers will be identified by CI to become part of the Farmer Facilitation Teams in the first rounds of site visits through an open application process where criteria will include willingness to participate, established presence and farming experience in the community, and equitable representation of women, men, and disadvantaged groups. These Mentor farmers will be brought on to the Project team, and provided with training by CI staff on how to be a Rangeland Stewardship mentor. Farmer Facilitators will be empowered by a Project Train-the-Trainers Programme based on existing Herding for Health (H4H) community mobilisation tools, the Rare behaviour change and leadership accountability approach¹⁵⁹, and Botswana's highly successful Young 1love's programme¹⁶⁰.
90. Training for Farmer Facilitation Teams will cover key knowledge, skills, and activities for developing climate-smart and gender equitable grazing plans based on three important foundations: the experience of CI and Herding for Health in using conservation agreements

¹⁵⁸ See Annex 2, Feasibility Assessment Sections 4 & 5 for more details

¹⁵⁹ Rare is a non-profit organization specializing in behaviour change management in conservation and environmental issues. See <https://rare.org/our-approach/> for more information.

¹⁶⁰ Young 1love is one of the largest youth NGOs in Botswana, having trained over 70,000 young people in nearly all parts of the country. Although Young 1love's approach is aimed at strengthening teachers of youth, it provides a framework of empowerment tools on "how to share knowledge" skills that will empower the farmer mentors to play an active role in imparting indigenous farming knowledge from the local area and to track progress of the Ecorangers and Restoration Team trainees

(RSAs¹⁶¹) for rangeland management actions (see Table 12); the Project's Climate Change Vulnerability Assessment (CCVA), ESMP, and Gender Action Plan; and the new World Bank consolidated expertise for Rangeland Management in sub-Saharan Africa¹⁶². These will be augmented by the local expertise that will be brought in as project staff, the Ministry of Agriculture Extension & Veterinary Officers, and the NGO/CBO project staff. Regional and local expertise will result in a framework of new tools that combine local and regional expertise into a product that can be developed and used during the Project implementation period and integrated into MoA and NGO extension into new areas beyond the life of the project (Deliverable 1.1.1c). The training will be provided in Training-of-Trainers short-course format, as well as ongoing mentorship support in behaviour change techniques and stewardship agreement negotiation skills. As part of the training, the groups will undertake field visits to key demonstration sites where implementation of the approach is ongoing. During the training, participants will develop behaviour change campaigns and core negotiation skills for facilitating the development of consensus-driven Rangeland Stewardship Agreements (see Activity 1.1.2). In year 1, starting with this core group of an estimated 225 individuals (project team, plus Ministry of Agriculture or Land Board staff), equitably representing women, men and indigenous peoples, the purpose and process for establishing a Rangeland Stewardship Agreement will be co-developed based on regional and global best practices with tailor-made adaptations as necessary for each Area or cluster. The individuals selected for the training will be representatives of:

- CI, hired through an open, transparent process for the project
- Government officials with the mandate of farmer extension, land management, gender equity, and local economic development;
- NGOs and CBO extension staff operating in the three Project Areas;
- Indigenous peoples and women's group NGOs

91. The training will be advertised via open public workshops as part of the inception of the Project. CI has budgeted for sixty participants per Project Area for the training which will be selected from the groups above based on the following criteria: attendance at the inception workshop, evidence and capacity for engagement with the target communities for the Project period, legal mandate to engage in climate resilient land or livestock management, or legal interest in land and livestock management in the target Areas. The grazing agreements will be co-developed through the H4H process for developing these agreements (detailed in FS Section 4) under Activity 1.1.2 and implemented through the activities in Component 2 as described further below. In year 2, CI Project staff will hold bi-annual workshops with the Farmer Facilitation Team Network across the nine (9) demonstration sites and priority site VDC meetings. Using lessons from demonstration and priority sites, the agreements and the trainings will be modified and shared through a similar process in years 3-5 in replication village grazing areas.

92. Bi-annual training workshops conducted by Rare and CI with the Farmer Facilitation Teams (FFTs) and Demonstration Site Leads during the first five years will facilitate peer learning

¹⁶¹ Rangeland Stewardship Agreements (RSAs) are the local name for Conservation Agreements (CA), a tool used by CI and others globally to build and enforce sustainable management of communally held natural resources. More information can be found under Activity 1.1.2.

¹⁶² Liniger, HP. and Mekdaschi Studer, R. 2019. Sustainable rangeland management in Sub-Saharan Africa – Guidelines to good practice. TerrAfrica; World Bank, Washington D.C.; World Overview of Conservation Approaches and Technologies (WOCAT); World Bank Group (WBG), Washington DC, USA and Centre for Development and Environment (CDE), University of Bern, Switzerland. Available at <https://www.wocat.net/library/media/174/>.

on Stewardship Agreements as a mechanism for rangeland governance and continual development of Stewardship Agreements for Botswana's communal rangeland climate adaptation plan. The purpose of this training is to transition stakeholders who are used to "Project-based thinking" (i.e. "participate in this Project and then wait for the next one") into real transformational thinking about building a rural restoration economy. The development of these skills and champions in working sites will greatly accelerate uptake and change, which is essential for sustainable adaptation at scale in these vulnerable areas. The facilitated learning sessions will also provide a platform where Project staff can co-develop implementation tools and strategies with participants. Budgetary assistance for quarterly visits to each cluster from a main "urban village" for the Farmer Facilitation Teams will be provided by the Project, based on prior Herding for Health experience on the value of these exchanges to building a network with strong farmer engagement skills.

93. At the end of year 2, a final workshop will bring together representatives from all demonstration sites to share their range of experiences and lessons learned from implementation at the demonstration and replication sites. CI, together with Rare, will facilitate a workshop based on design charrette methodology¹⁶³ and Rare campaign development approach in which experiences and concerns expressed by the demonstration site representatives are translated into tools for future use in extension activities. The farmer facilitator teams, representatives from the demonstration sites, community representatives, and communications experts will participate in the charrette to develop training materials most relevant to the distinct contexts, climates, and cultural traditions of the Project Areas. Please see Annex 2, Section 4 and Appendix 12 for examples of the tools and training materials to be developed.

Activity 1.1.2. Build collective understanding and equally empower male and female participation in Rangeland Stewardship Agreements within Botswana's legal and governance framework.

94. In line with FPIC guidelines and all ESS and GAP recommendations presented in the proposal annexes, the Project will introduce the use of Rangeland Stewardship Agreements (RSA) as the backbone of a new communal rangeland ecosystem management system. RSAs are the local name for Conservation Agreements (CA)¹⁶⁴, a tool used by CI and others globally to build and enforce sustainable management of communally-held natural resources. They are particularly effective for responding to uncertain climates in that they are evaluated and re-negotiated periodically and therefore can adjust management requirements more quickly than a legislated approach and are therefore more suitable for application in dynamic rangeland ecosystems. They are also negotiated directly with the land users of a site and therefore can integrate indigenous knowledge systems into management strategies. Stakeholders felt that RSA was a better term for agreements for Botswana's communal grazing lands, to differentiate them from Communal Conservancies where only wildlife activities are allowed under the country's laws.

¹⁶³ A charrette is a gathering that empowers local communities as clients that work with artisans to develop the best interpretation of community needs. The process is most often utilized in architecture, but CI has used the approach to design ecotourism strategies, brochures, and infrastructure in the past.

¹⁶⁴ The Herding for Health Initiative is based on the application of the CA approach to negotiate and establish site specific restoration and herd management plan for a given communal grazing area. Training and a tool-set as well as case-studies are available for use of the approach for rangeland rehabilitation and collective grazing in the context of climate resilience. (see Feasibility Study, Section 4 for more details)

- 95.** The format for a Rangeland Stewardship Agreement will be designed and refined to align with Botswana's legal framework. Community-Based Natural Resources Management (CBNRM), and local government policies are currently under review - at Project inception, a legal and policy specialist will be hired to update guidance and provide an agreement template to be used by the Project in accordance with Botswana and GCF regulations (see examples in Feasibility Assessment Section 4). RSAs will therefore be a new legal tool under contract law, that the Project will seek to promote into new agriculture, rangeland management, and climate legislation (see Output 1.5).
- 96.** Individuals within a community will have varying levels of knowledge and experience regarding climate, rangeland, and livestock management practices. To enhance opportunities for equal participation, learning opportunities will be created and facilitated by the Project team on climate change and how it relates to at least three key topics: gender awareness, rangeland stewardship, and livestock management. Dedicated legal and gender staff will be hired by CI to work as part of the Project team to implement the ESMP and GAP as an integrated component of inception engagements, ensuring Rangeland Stewardship Agreements' compliance. Training events, specifically on the legalities and best practices on gender equity, indigenous peoples, climate change, and livestock management will be fully incorporated into the Project and further embedded in all local institutions through leadership training led by sub-grantee Rare and public commitments to Rangeland Stewardship Agreements that represent equity principles and validated through village-level signing ceremonies.
- 97.** VDCs' Rangeland Stewardship Agreement signing ceremonies will take place within the target communities. Public commitment is recognised as a key motivation for behaviour change¹⁶⁵ and signing ceremonies enable the community to celebrate a milestone achievement in what can be a difficult consensus-building journey. These ceremonies are also important for the community-building that has been shown to improve long-term adaptive capacity and reduce vulnerability for marginalised members of society¹⁶⁶.
- 98.** Assessments will be gathered before and after each training event and captured in the Rangeland Stewardship Information Portal (see Output 1.4) in a way that guides Farmer Facilitator Teams and the gender and legal staff on key areas for further engagement and training. In this way, the Project puts ongoing, locally relevant empowerment of land-users at the core of its strategy.
- 99.** The success of communal rangeland management is directly correlated to quality and transparency of governance. When a Rangeland Stewardship Agreement is challenged or needs greater clarity for enforcement, Project staff will support legal assessment and guidance in key precedent-setting cases. Where requested, CI will also offer leadership and conflict-resolution training to local VDC representatives to proactively mitigate risks to the successful implementation of Stewardship Agreements. Trainers will be required to produce modules of leadership and conflict resolution trainings for uploading to the Rangeland Stewardship Information Portal. These modules will also be made available to the broader community for any individuals or organizations interested in pursuing self-development.

¹⁶⁵ Green, KM et al 2019. A Meta-Analysis of Social Marketing Campaigns to Improve Global Conservation Outcomes. Social Marketing Quarterly, Volume 25, Issue 1. Pp1-19

¹⁶⁶ Berkes, F. 2007

Activity 1.1.3. Replicate and amplify Herding for Health (H4H) approach to develop locally appropriate Ecosystem-based Adaptation (EbA) Rangeland Stewardship Agreements, grazing plan designs, and support partnerships across Village Grazing Sites.

- 100.** To maximise potential impact for relevant exchange programmes and training hubs, CI will initiate Project activities at nine (9) Village Grazing Areas where VDCs and farmers are willing to serve as Demonstration Sites for their cluster. As training sites, these communities will become important learning centres for future roll-out within their “cluster” and locations where the Project Team can co-develop implementation tools and strategies that reinforce adaptive management. Since demonstration sites will need to be running by Year 2, a transparent application process will be run by CI in Year 1 to select a demonstration site delivery partner (VDC, NGO, or CBO) who will be provided with resources through an in-kind grant. Each demonstration site delivery partner will be required to:
- Sign an MOU that defines all partners as collaborators on the GCF project and sets terms for coordination to achieve the project goals and workplan objectives;
 - Submit monthly M&E data;
 - Commit time to participation in training and lessons learned sessions;
 - Identification of a dedicated community champion who is willing and able to be skilled as an exchange host and organizer;
 - Oversee and manage implementation at the site.

Any legal entity with an interest in a demonstration site may apply. Proposals may be submitted by VDCs themselves or by NGOs/CBOs on their behalf. The application will include evidence of commitment from the community for the activity (beyond simply evidence of a relationship with the community).

The application process will also request applicant entities to demonstrate their human and financial resources for covering these activities. Additional eligibility criteria will be:

- legal personality/registration;
- track record working with targeted community;
- relevant field presence and/or staff capacity;
- evidence of level of relationship with target communities / stakeholders.

Should more than one applicant apply for a particular cluster and their capacities on the above be equal, crucial additional considerations will include:

- Project alignment with partner objectives and expertise/experience;
- Spatial prioritization (geographic position) for cost efficiencies for cluster level trainings.

- 101.** Rangeland Stewardship Agreements will be facilitated by the Farmer Facilitation Teams (FFT) with all villages using a single grazing area. FFTs will be established and coordinated by CI and will include representatives of local government officials from the Ministry of Agriculture, Ministry of Gender Affairs, Land Boards, and local NGOs and CBOs. There may be one or multiple villages per Agreement, but all farmers, the grazing area VDCs, and respective Land Board enter into an agreement with CI to enable its effectiveness according to the current Tribal Lands Act. CI will have final approval over these plans to ensure compliance with project criteria as well as ESS considerations. The fundamental elements of each Rangeland Stewardship Agreement (RSA) include:

- Spatially explicit restoration and communal grazing plans developed by farmers with support from MoA, DFRR, and the Project scientific team (CI). Climate change considerations will be included in the plan through identification and targeting areas most at risk to climate hazards, including extent of bare ground, erodible areas from intense rainfall events, and areas that pose the greatest fire risk with projected wind and temperature changes.
- Description of implementation support that will be provided by Ministry of Agriculture (trained Ecorangers, Monitors, and Restoration workers; Veterinary Support) and by CI (Grazing Support Package of equipment; Market Readiness Support) to successfully implement the grazing plan (see Annex 21 Operations and Maintenance Plan for short and long-term arrangements for implementation). The Ministry of Agriculture will be a party to the RSA for purposes of providing its implementation support.
- Requirements for participation by farmers include that their animals become part of the village herd and participate in vaccination, nutrition, breeding, and market access programmes; This will include participation in training events, and contributions to livestock production and market access events.
- Consensus driven sanctions in the case of farmer non-compliance with RSA terms;
- A sustainability plan that describes what processes and commitments all stakeholders will make from Year 1 to ensure continuation of activities after the project implementation period based on local conditions and capacity.

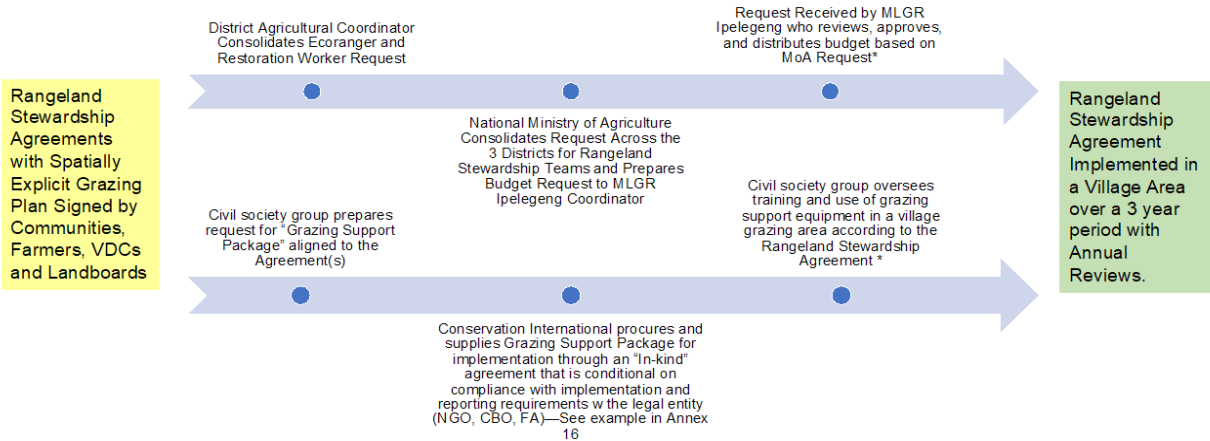
The RSAs will define the benefit package resulting from the community negotiation process, with final approval from CI. The goods and services ultimately provided to each Village Grazing Area will depend on 1) what site-specific grazing/restoration actions are required (e.g., what number of Ecorangers, what kind of restoration team and tools, what kind of veterinary support, whether a water bowser or a bush-fodder machine is required, etc.); 2) what level of commitment the community is providing to support the implementation of the grazing plan (e.g., a water bowser will only be provided with full compliance and voluntary participation in communal herding by the farmers themselves); and 3) what level of support is required to ensure equitable participation by indigenous peoples and women (e.g., is childcare already provided by other programs or is this something that is locally required to ensure equal opportunity for participation and beneficitation). More detail on the process and how commitments to land and livestock management plans and associated benefit packages are reached is provided in Annex 2 Section 4 and its appendices, as well as in Figure 18 below.

102. To enable single parents and women to participate in the programme, partnerships will be developed with local nursery schools to provide enhanced childcare as part of the benefit package to an RSA. CI will select an appropriate service provider for villages where this service is not already available through CI's standard procurement practices. This will ensure the Project does not make children more vulnerable when parents are trying to work as Ecorangers or as part of a Restoration Team and will be a key part of the Project support to Rangeland Stewardship efforts.

103. The institutional approval of Rangeland Stewardship Agreements will follow the procedures established by the Livestock Management and Infrastructure Development (LIMID) government program – whereby VDCs submit proposals for the agreement after receiving guidance from Farmer Facilitation teams and Department of Veterinary Services Extension Officers, then are approved by District Animal Production Offices. After approval by the District Agriculture Coordinators, the agreements are sent to the Ministry of Agriculture for

final approval and signature.

Rangeland Stewardship Agreement Implementation



* Note that the detail of the operational flow and who employs Ecorangers and Restoration Workers will be developed in the first 18 months of the project.

Figure 18a) Rangeland Stewardship Development Process

Rangeland Stewardship Agreement Components

Rangeland Stewardship Agreement—MoA, Land Board, VDC, All Livestock Owners

Legally endorsed agreement that is developed with project facilitation support using H4H and FPIC guidelines. The RSA provides spatially explicit rehabilitation and land use plans, a list of support required to implement the plan (bomas, #of ecorangers, tools); who will oversee the grazing support; an overview of the feedback, grievance and sanction processes; and a sustainability plan which details savings, maintenance, employment arrangements, and profit share after the project.

Grazing Support Package "In-kind Agreement"

Legal agreement between Conservation International and the legal entity who meets due diligence requirements for overseeing deployment of grazing support in-kind goods for a particular Stewardship Agreement (NGO, CBO, CBNRM Trust, Farmers Assoc, VDC.). This agreement specifies the support provided by the project for implementing the Rangeland Stewardship Agreement and details all oversight requirements and liabilities related to the implementation support. It also details GCF regulations and requirements for how equipment purchased under the project will be transferred at the end of the project.

Private Sector "Supplier Contract"

Legal agreement between livestock buyer and the farmers association that expresses conditions of purchase tied to ongoing implementation of the Rangeland Stewardship Agreement. This mechanism provides the long-term incentive that ensures the sustainability of GCF investment in a particular Village Grazing Area. Through Herding for Health, Meat Naturally is committed to this arrangement, however, the project will also promote the approach to other value-chain players to diversify risk and optimize benefits of competition for beneficiary groups.

Figure 18b) Rangeland Stewardship Legal Agreements; Rangeland Stewardship Agreements Implementation Stakeholders and Processes (a) and Legal Components (b) as the foundation for project implementation and sustainability (See Feasibility Study, Section 4 for more details)

104. The proposed expenditure on capacity building within this Output is the result of the breadth and depth of desired behavior change and governance in marginalized communal rangeland systems. By year 6, the Project will have 104 active sites at different stages of engagement. Development of Village Grazing Area sites later in the implementation period will be made easier through use of exchange visits to areas with successful sites, but replication of key trainings will still be required. Regular engagement and capacity building

also ensures that knowledge transfer, technology uptake, and behavior changes are cemented into new community norms and policies. All too often, investment is made into infrastructure that is abandoned post-project due to lack of re-enforcement or ensuring understanding, valuing, and using tools in the local context. This is particularly true in dynamic rangeland ecosystems where climate and ecological response are so intertwined. Botswana is also in its least stable political period in recent times. As such, additional budget is proposed for repeat engagements with VDCs and government officials to mitigate against risks of leadership transitions. More information is provided in the Annex 4 budget notes.

Output 1.2: New job creation programme and veterinary approach for climate responsiveness are adopted by national departments. *Key Deliverable:* Improved coordination and expanded *Ipelegeng* Job Creation¹⁶⁷ and Veterinary Services investments for communal rangeland restoration, professional herding, livestock-based GHG emissions reductions, and enabling Commodity-based Trade.

105. Building the capacity of government to coherently govern and manage impacts on communal rangelands will enable better decision-making and deployment of support Programmes that will proactively reduce national GHG emissions and build adaptive capacity - which will become increasingly critical as climate change impacts worsen over time. Improved coordination between local and national efforts and expertise through the provision of technical assistance and training to government partners will mainstream recognition and coordination of the new rangeland stewardship investments with other government bodies, development programmes, and research efforts. The formal establishment of a new use of the *Ipelegeng* job creation program will offset costs of current investments into reactive drought relief and is, therefore, a critical government investment into preventative and cost-effective climate change response. Similarly, a new Commodity-based Trade team at the Department of Veterinary Services will proactively build local level adaptive capacity as part of a regenerative management system for ecosystem-based adaptation and mitigation. Due to the urgency of the need and normally slow legislative and operations development procedures, GCF investment is required to catalyze new human resource positions, systems, and structures that will enable climate-based planning, decision-making, and support functions.¹⁶⁸

Activity 1.2.1. Support establishment of inter-institutional coordination mechanisms for climate-resilient rangeland management and emissions reductions across government, NGOs, community-based organizations, and farmers' associations.

106. To address the stakeholder-identified policy-implementation gap, two coordination mechanisms will be created and supported by the Project. The first is local level Rangeland Stewardship Forums, which will be local forums that meet bi-annually within each Project area. The Project Area Director and her/his team will perform Secretariat functions for these Forums and agenda items for forum meetings will be set by the participants from civil

¹⁶⁷ The Ipelegeng Programme is "a Government Initiative or programme whose main objective is to provide short term employment support and relief whilst at the same time carrying out essential development Projects that have been identified through the normal development planning process." (<http://www.gov.bw/en/Ministries--Authorities/Ministries/Ministry-of-Local-Government-MLG1/Tools-and-Services/Services1/Ipelegeng-Project1/>)

¹⁶⁸ Botswana's commitment to uptake fiscal responsibility for ongoing implementation, staffing, and operational maintenance of equipment is provided in a letter of commitment (Annex 25).

society, farmers groups, and government agencies. Over the life of the Project, each target community will be given an opportunity to creatively showcase the development of their adaptive capacity at least once with the support of CI's Project communications team. The dual purpose of these presentations will be to ensure policymakers are aware and able to design appropriate responses to local experience of climate change, but also create an important repository of qualitative information on Project impacts to augment quantitative data.

- 107.** The second mechanism will be a core government body Inter-ministerial Project Steering Committee (PSC) under the Ministry of Agriculture that will serve to review and report Project progress against targets and discuss any new barriers or opportunities. Timing for key annual review meetings will be in September of each year to optimise potential relevance for inputs into National Development Plan reviews, initial budget discussions, and communications to UNFCCC Conference of Parties. Additional PSC meetings will be scheduled as needed. Representatives in the PSC will also be invited to Rangeland Stewardship Forums to keep in touch with ground level issues but will not be expected to attend each Area meeting.
- 108.** CI will identify and facilitate complementary training collaborations between VDCs and broader agricultural land, water, and health strategies. The Project team (CI) will ensure representatives of crop, water, and health interests are aware of opportunities to integrate their priorities and are involved in grazing strategy development and complementary training efforts to expand local resilience and sustainability of climate-resilient livestock production. In the first year of the Project, the Project Lead and Area Managers (CI staff) will engage with national departments to further embed and align Project activities and monitoring with initiatives of the Ministry of Agriculture (MoA), Department of Crop Production; Ministry of Land, Water and Sanitation; and the Ministry of Health. The MoA will support identification of leveraging opportunities through representations of the project at Rural Extension Coordination Committee (RECC) and Rural Development Council (RDC) coordination meetings.
- 109.** Known potential collaboration opportunities from prior Herding for Health Project sites¹⁶⁹ and local consultations provide insight on how the Project team can further leverage adaptation and mitigation benefits within the Project. For example, depositing manure on old croplands to enhance soil carbon sequestration potential and climate-resilient crop production, growing of fodder within household gardens that can be sold to VDCs as part of their livestock management strategy, constructing new boreholes for watering animals away from human sources, collaborating with conservation and tourism interests on mobile water bowser deployment for optimal use by livestock and wildlife, and integration of deworming and enhanced sanitation activities to break the cattle-hosted tapeworm cycle. The latter is particularly important for market access as cysts of the tapeworm in cattle are not accepted in formal markets and prevents private sector actors from sourcing from communal lands¹⁷⁰.
- 110.** This activity will deliver at least one new partnership per Project area with the relevant ministries and will further strengthen institutional delivery of a coordinated response to reducing climate vulnerability of target communities through the establishment of a climate-resilient livestock-sector. A particular effort will be made to work with ongoing Ministry of

¹⁶⁹ <https://www.peaceparks.org/h4h/>

¹⁷⁰ Feasibility study, Section 5 Market Assessment and Sustainability Plan

Health initiatives and coordinate efforts with public health projects in Botswana. For example, livestock managed in a way that reduces manure concentrations and shared water point use with community water sources can also help reduce incidents of diarrhoea that will be important for resilience in times of climate stress¹⁷¹. This activity recognizes that the institutional context in an area over an 8.5-year project does not remain constant. Partnerships with government, NGOs, projects implemented by other donors, or other actors may be linked to public health, disaster management, public sector initiatives, or education will provide new opportunities for the project to further develop and embed climate resilience. CI staff will be tasked to identify and develop such partnerships that may be unique to a particular village area or cover several villages. The partnerships and their contribution to Project impacts will be documented in MOUs between CI and the new partner and will include a monitoring component to ensure impact is measured.

Activity 1.2.2. Support the development of a Rangeland Stewardship job creation initiative under the Ipelegeng Programme within the Ministry of Agriculture and Ministry of Local Government.

111. CI will work with the Ministry of Agriculture and Ministry of Local Government to develop and deploy a transformation strategy and legislative engagements for the *Ipelegeng* programme to implement job creation for rangeland restoration and Ecosystem-based Adaptation in the target regions. This activity is therefore foundational to Output 2.1. CI will engage with experienced government programme specialists to design and test new regulations and standard operating procedures (including an *Ipelegeng* Operations Manual) to test the training and deployment mechanisms for the first 500 EcoRangers and Restoration workers for the new initiative in Year 1 and 2 at the demonstration sites (Phase 1: 500 workers). Over the following six years, CI will support the Ministry with enabling policy procedures to deliver two intake periods, years 3-5 (Phase 2: 1500) and years 6-8 (Phase 3: 3500) that will employ in total 5500 Ecorangers¹⁷² and Restoration workers. This support will include CI providing training to MoA on the creation of SOPs and implementation systems for the *Ipelegeng* Rangeland Stewardship Programme based on CI's experience in a similar job creation program in South Africa. This training is separate from the training provided in Activity 2.1.1 (training of *Ipelegeng* workers). CI will also support the Ministry to develop annual impact report templates from the programme and support supervision of students from universities in Botswana who undertake studies on the efficacy and efficiency of the programme at building climate resilience and reducing poverty as contributions to project reporting. For example, the development of a Standard Operating Procedure system for measuring "technical effectiveness" of the interventions is a key element of sub-activity 1.2.2a.¹⁷³ In addition, South Africa's Norms and Standards, with the Health & Safety (including COVID prevention and response) and Personal Protective Equipment¹⁷⁴ relevant to most natural resource management interventions can guide the development of similar protocols for the *Ipelegeng* investments both during and after the Project period.

¹⁷¹ Whitmee, S et al (2015). Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health; Berrian et al (2016)

¹⁷² Professional herders employed and trained with government co-finance to protect livestock, maintain areas that have been cleared of invasive species and gather biological data for monitoring conditions in the rangelands.

¹⁷³ An example of Quality Management support information from the South African Working for Land and Water systems that CI uses within a Herding for Health projects is found here: <https://www.dropbox.com/sh/uzhb5r7h3vmczos/AAC2S0ZvnToAbuC46dB0NHYEa?dl=0>.

¹⁷⁴ Operational Standards – Invasive Alien Plants: <https://www.dropbox.com/sh/phy2zya00db31hi/AABqmKbljtv1O8zseCNVZy0fa?dl=0>

Activity 1.2.3. Expand capacity of Ministry of Agriculture, Department of Veterinary Services to respond to climate-induced diseases and infections and enable Commodity-based Trade in the Project Areas.

- 112.** To address one of the key risks and barriers to adaptation and market access by communal farmers, the Project aims to significantly increase animal health management capacity across the target areas, noting that improved animal health is known to translate into both mitigation and adaptation benefits. Specifically, CI will provide focused planning, skills development, infrastructure, and human resource capacity to address the needs of communal farmers engaged in Rangeland Stewardship Agreements in partnership with the Department of Veterinary Services (DVS). The DVS will be supported to refine their protocols and procedures to include current and projected climate change impacts and a capacity expansion plan per sub-district to focus on the Project goals as part of the Farmer Facilitation Team. The Project will also contribute to key resource capacities for meeting trade standards identified in 2019 evaluation visit by the OIE (see Annex 2, Section 4).
- 113.** As the science of climate change and veterinary health and disease control is rapidly evolving, CI will provide drones to the DVS and refrigerators to each village (many vaccinations and veterinary medication require refrigerated storage, and this limits local response capacity) via in-kind agreements to enhance local response capacity of DVS to respond to climate-induced increases in disease outbreaks. CI will also provide network support, IT tools, and links to academic researchers who can work alongside existing and new veterinary staff to build understanding of the positive and negative impacts of various land and grazing management activities on livestock health in coordination with Ecorangers deployed in village grazing areas as part of Output 2.2.
- 114.** CI will engage a consultant to help the DVS develop regulatory protocols that consider climate-induced risks in routine checks, particularly those that can enable Commodity-Based Trade (CBT) compliance in the context of climatic conditions (i.e., different regulations may be required at different temperatures and staff need to be aware and able to access information on regulatory checks based on climate situations that drive disease risk). This protocol development will be undertaken based on the recommendations of the Animal Health staff who will be trained in these tools, research results, and protocols at annual Project Learning Weeks. As with the communities, DVS staff will also be supported to creatively capture and share their experiences during annual Learning Week workshops, using lessons learned from Rare trainings. These experiences will be captured as part of the Project M&E for replication. Finally, the Project will test the use of Ecorangers for quarantine management and technology-enabled use of drones for vaccine and medicine distribution¹⁷⁵.

Output 1.3 New rangeland management curricula developed and operationalised to expand skills for restoration and regenerative grazing. *Key Deliverable:* An Ecoranger Training Curriculum that is formally registered and embedded in national Rangeland Stewardship programme.

- 115.** Botswana has a depth of agricultural and natural resource expertise that is inaccessible to

¹⁷⁵ <https://www.dvm360.com/view/future-veterinary-medicine-drones-veterinary-practice>

many Project beneficiaries. CI and GoB will seek to expand access to traditional and academic expertise to manage the land and livestock assets of farming households that utilize communal grazing lands. The distribution of traditional and academic knowledge and coping mechanisms will become ever more important as climate change impacts become more severe.

Activity 1.3.1 Create and monitor deployment of a new national curriculum for climate-resilient livestock herding to build adaptive capacity at the individual and community level.

- 116.** Activity 1.3.1 will draw on information from traditional herding practices and academia to integrate these into the design and implementation of a herder and restoration adult education programme that will become a required component of the *Ipelegeng* Ecoranger programme. Skills used and trained in the broader H4H programme for restoration (as provided in Tables 11 & 12) will be core to the training. In addition, Ecoranger and Restoration Worker curriculum will include fire management strategies such as grazing of fire-breaks (See Annex 30, page 62), wilderness training on management of cooking fires in the rangelands, and basic fire-response skills for safety and risk reduction.
- 117.** The formal certification process of the curriculum will bring dignity and new skills to the individuals employed in the public works programme and the practical nature of the coursework enables on-the-job short course training to be implemented as “assessable” and expert-supervised course projects that support implementation of Rangeland Stewardship Agreements for EbA in the 104 grazing areas. Only *Ipelegeng* beneficiaries will be selected for the training programme and so the Project will provide support for climate resilience at both the household, community, and ecosystem level. Institutionally, it will also compel the Botswana University of Agriculture and Natural Resources (BUAN) and its Centre for In-Service and Continued Education BUAN-CICE) to include lessons learned in the provision of the course into its teaching and modernize its formal university programme to include climate considerations.
- 118.** CI will enter into a Grant Agreement contract with BUAN-CICE to implement this activity. CI will be the Executing Entity for this activity, as it will retain decision making authority by approving annual grant budgets, workplans, procurement plans, and reports for the activity. These terms will be explicit in the grant agreement between CI and BUAN-CICE.
- 119.** BUAN-CICE will use the first year of the Project to finalise the development of a national qualification for Ecorangers, as well as certificate courses for Restoration Workers¹⁷⁶. BUAN-CICE will also enter into facility-use and training arrangement agreements, in a form and substance acceptable to CI, with the Ministry of Agriculture for the implementation of the training in Activity 2.1.1 as part of the requirement for GCF finance for curriculum monitoring and refinement during the Project period. Drawing on the support of the Herding for Health Training Collaboration, which includes the African Holistic Livestock Centre, the South African Herding Academy and the Southern African Wildlife College, BUAN-CICE will work with a specialist consultant team to design a curriculum that provides progressive training in eight core skills¹⁷⁷ over the three-year implementation period of *Ipelegeng* job

¹⁷⁶ <https://covid19portal.gov.bw/document-library>

¹⁷⁷ The eight core skills to be covered in the curriculum are: life skills, health and safety, record-keeping and management, climate change and environmental management, planned grazing, human-wildlife conflict management, climate change and animal husbandry, climate change and disease detection and mitigation (See Annex 2, Feasibility Assessment Section 4 for more details.)

creation. BUAN-CICE will procure the consultants, and CI will approve the final selection. Course materials will be adapted and augmented based on existing materials as much as possible, while ensuring that the information that is provided reflects local contexts, current best practices, and known climate impacts.

- 120.** In addition to technical skills development, the three-year training curriculum will also include a life-skills component including financial literacy, HIV/AIDS prevention, family planning, and leadership skills delivered by qualified partners. Randomised trials of different delivery and assessment methods, including ones that involve local mentor farmers, will be used with the first Ecorangers and Restoration Worker Teams at the demonstration sites in conjunction with the Project Planning and Adaptive Management team and technical advisors. Training field work assignments will take place during herding periods and reports will be submitted via the Ministry of Agriculture's Wi-Fi hubs to the Rangeland Stewardship Information Portal. Competency will be assessed by accredited BUAN-CICE and its training service providers who have the appropriate qualification level. In this way the final registered curriculum will also have an assessed teacher toolkit of approaches to draw on for delivery of training at scale in years 3-8.
- 121.** CI will approve the final National curricula and any other training/educational materials to be developed by BUAN-CICE, prior to their implementation and use in the trainings.

Output 1.4. New rangeland monitoring system is operationalised, embedded, and utilized in market, carbon monitoring, and policy systems *Key deliverable:* Improved availability of data and 90% of individuals trained have improved skills and use information for climate-resilient communal rangeland and livestock management.

- 122.** A Rangeland Stewardship Information Portal will consolidate existing and emerging databases (e.g., BRIMP, StatsBotswana Economic Impact of Drought) with Project generated data to provide a key tool for tracking climate change impacts on communal rangelands and to analyze trends on success/failure of different management interventions on the broader regional economy to inform policy and programme priorities over the short, medium, and long-term. This ability to measure and undertake adaptive management at local and regional levels will be important as the impacts of climate change become more severe over time. The portal will become a central information management database that can be used by communal farmers, NGOs, CBOs, government, and researchers who are seeking to better understand EbA effectiveness and intervention impacts on mitigating GHG emissions. CI will be the EE for the development and piloting of the RPI during the Project period, but the management of the Portal (with CI approval and oversight) may transition to the appropriate government entity after the mid-term review. The Project will also work with StatsBotswana¹⁷⁸ to develop indicators and data collection methodologies so that the Portal can measure regional economic impacts of the Project relative to historic data and other regions.

¹⁷⁸ Statistics Botswana (or StatsBotswana) is the parastatal organization charged with responsibilities of collecting and disseminating all official statistics in Botswana. Its information is publicly available, and there will be no exchange of funds for StatsBotswana's participation in the project.

Activity 1.4.1. Establish a Rangeland Stewardship Information Portal as a tool for climate-responsive planning and monitoring

- 123.** CI will create a new Rangeland Stewardship Information Portal to consolidate information that facilitates planning and development of climate resilient communal rangeland management. The portal will be developed in collaboration with MoA, DFRR, and linked to the Department of Meteorological Services' (MET) early warning system. The purpose of the integrated system will be to capture information on rangeland degradation, as well as wildlife monitoring systems for farmers and Ecorangers, and link to the DPLG Drought Assessment system and MoA *Ipelegeng* Wage Accounts to provide monthly monitoring data on impact and productivity for VDC, district, and national level decision-making. It will also link existing web-based applications to a central report-generating database that is housed in the cloud and accessible to all departments requiring or inputting information. The host agency for the Portal will be defined as part of this activity when capacity, mandate, and portal design requirements are better defined.
- 124.** A primary use of the Portal will be to support Farmer Facilitation Teams to co-develop village level grazing plans with farmers and VDCs in target communities. The use of the Portal to manage information, monitor job creation investment impacts, and generate reports for national and international obligations is pioneering and transformational. Visualisation of the data will be on Tableau or similar existing systems. The portal builds on South Africa's Working for Water: Water Information Management System (WIMS) but embeds lessons from a variety of users who were involved in reporting into the system over the last decade. It also can increase uptake of Botswana Animal Identification System for livestock traceability (BAITS) - drawing on lessons from Namibia's traceability system. The Portal will also draw on technologies being tested by Herding for Health partners to measure the impact of climate and herding on ecosystem health, livestock health, and human health and will seek to align with StatsBotswana to develop a consistent impact measurement of this on regional economic resilience to climate change, particularly climate shocks¹⁷⁹. Trends.Earth will be used for change monitoring and linked to new Italian-funded weather stations. Consolidation of WhatsApp for business images by graduate monitors in the field will augment evidence support behind remote-sensing data.

¹⁷⁹ (<http://trends.earth/docs/en/>)

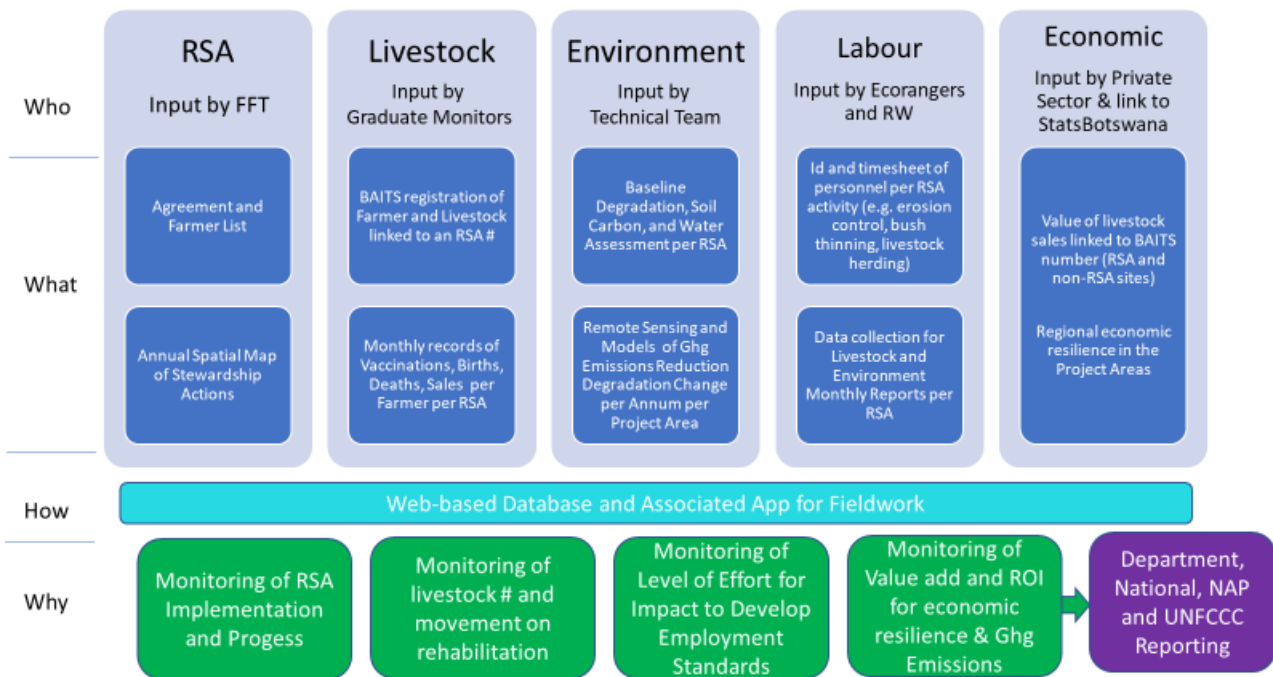


Figure 19: Rangeland Stewardship Information Portal framework - Note: Economic indicators updated to include StatsBotswana.

125. As part of Project inception, the Project Technical Director and Portal Manager (both CI staff) will head a task-team and a series of “Development Hack-a-thons” that include existing models/system managers to brainstorm a variety of development options. The best features will be selected by the task team, user groups which include community and government representatives who will participate in the development of the new system. This growth of Information and Communication Technologies (ICT) capacity across stakeholders in rangeland management is critical for Botswana to implement this integrated approach to respond to climate change while institutional alignment moves more slowly. Annual system reviews and system upgrades are planned for every second year of Project implementation. This will enable the Portal to grow iteratively as needs shift with increased climate, community, and technology changes.

Activity 1.4.2. Train and support staff, farmers, and relevant officials to enable access to the Rangeland Stewardship Information Portal for improved decision-making and EbA planning and to ensure sustainable reduction in emissions.

126. The primary objective of the hubs will be facilitating the uploading and downloading of information from the Rangeland Stewardship Portal and to support implementation questions by individual farmers, VDC members, and the Rangeland Restoration Teams in remote sites and access to national registration and vaccination record-keeping systems. This will affect timely adaptive decision-making support at the local level and reduce transportation costs and emissions.

127. New solar powered Wi-Fi stations are emerging as a solution to fill the IT access gap for

rural people¹⁸⁰. At inception, the IT and Wi-Fi needs of each community will be assessed by Project staff and plans to support identified needs will be developed once a Rangeland Stewardship Agreement is signed (Activity 2.2.1a). CI will provide each community with innovative Wi-Fi hub equipment via the in-kind grants described in Activity 2.2.2. Through the RSA negotiation phase, it will be made clear that non-compliance with stipulated climate-resilient practices can lead to the removal of the Wi-Fi hub. Although this may seem punitive, internet and market access are key incentives that CI has found leads to a community developing internal and independent compliance detection and enforcement of RSAs. These are more likely to be sustained and are easier to transfer to a private-sector arrangement at the end of the project to ensure collective management improvements and emissions reductions are continued. As part of the disposition instructions provided during the closeout of the in-kind grant agreement, and with the approval of the GCF, the Wi-Fi hubs will be transferred to the VDCs, which will then directly pay for the Wi-Fi services.

- 128.** Project staff and participants will iteratively design and create feedback reports to be provided to the VDCs and farmers that consolidate information from the Rangeland Stewardship Information Portal on climate, livestock condition, rangeland health monitoring, and market access statistics from stewardship implementation practices that year. A communications team will spend 50% of their time working with farmers and experts to help design visualisation tools to present monitoring information back to farmers. The system will also solicit farmers' feedback on decisions taken, based on the information provided, to document any change in adaptive capacity. The purpose of this effort is to expand understanding of the links between landscape management, climate risk reduction, and individual and collective decision-making and this analysis will be a core part of the graduate monitors and Project M&E team job functions. Should carbon financing be able to be linked to improved management at a VGA, the system will also provide transparency to the community on the basis for calculations and associated payments.
- 129.** Complementary use of WiFi hubs with local entrepreneurs will also be encouraged where possible (see 3.1 and selection criteria for local entrepreneurs). ICT literacy training and a mentorship plan will be designed during the Foundational Phase of the Project by CI and the service provider selected for the development of the Portal. During this phase, at least three different approaches will be tried across the nine different target communities and assessed for resulting understanding (pre- and post-training assessments), uptake (number of times information is accessed), and perceived ease of use and usefulness. Lessons learned will be applied to the roll-out strategy for replication; reviewed again, and then rolled out for amplification sites. In addition to community-based users, special training on the Portal on how to access it, use it, and analyse the data will be provided by CI and the service provider to 460 local officials and 40 national officials. Graduate monitors will be used to support ICT and analyse needs at key departments as a means of bridging policy-information gaps. Trainings will be designed by the CI Technical Director, her/his team, and a professional consultant team based in each region.
- 130.** An ICT consultant, based in the Districts, will be deployed to ensure ongoing support is in place at the District level. Discussions on the review and updates to the system in year 8 will also focus on putting into place transition arrangements and plans for continued maintenance and use of the Information Portal after the Project implementation period.

¹⁸⁰ See Rwanda AREP model: <https://edition.cnn.com/2019/09/23/tech/solar-kiosks-rwanda-intl/index.html>

Output 1.5. Improved government policy initiatives on climate change actions and needs, enabling adaptive management. *Key deliverable:* Integration of the Project's approach and lessons into national policies (in particular the National Development Plan) and international agreements that support improved communal rangeland governance and emissions reductions in Botswana and other African countries.

Activity 1.5.1. Promote the Project EbA and emissions reduction approach and lessons learned to key decision-making forums.

- 131.** CI's Africa Division Climate Change Manager, CI's Herding for Health Director, CI's Chief of Party and a Botswana-based Programme Policy Coordinator (the Project's Climate Change Policy Team, composed entirely of CI staff) will support the development and distribution of technical studies and policy briefs relevant to the Project approaches and lessons learned. Key studies will be focused on the return on investment of Project funding (government investment and GCF contributions) relative to key National Development Plan indicators and integration of value derived from ecosystem restoration into the country's natural capital accounts. The policy briefs will be shared extensively nationally and be made publicly available.
- 132.** The Climate Change Policy Team will also utilise the mid-term and final GHG Inventory Assessments as a capacity building opportunity to promote EbA approaches and targets for inclusion in Botswana's NDCs, National Adaptation Plan, NAMA, and other climate change strategies. At least three policy briefs will be developed and formally submitted to national climate change bodies during Project implementation and at least one of these briefs will be focused on lessons from the Project that can inform the Botswana Gender and Development Strategies. Additionally, the Project will support the creation of a Gaborone Declaration for Sustainability in Africa¹⁸¹ and/or South African Development Community climate-resilient livestock production forum, to be held in alternate years from year 2 where the policy briefs, as well as other case studies and lessons learned, can be shared for uptake and replication. A particular opportunity exists for Botswana to contribute to events marking the United Nations Decade for Ecosystem Restoration¹⁸² and AFR100 commitments¹⁸³.

Component 2: Reducing GHG emissions and negative livelihood impacts through new job deployment in rangeland rehabilitation, improved livestock management, and climate impact monitoring.

- 133.** The purpose of this component is to build climate change resilience and low carbon livestock production in Botswana's communal rangelands to produce key paradigm shifts. The Project uses the H4H model and new recommended changes in the *Ipelegeng* job creation programme to deliver sustainable rangeland stewardship and climate-resilient livestock production across the Project target areas. Based on previously documented and Project-

¹⁸¹ The Gaborone Declaration for Sustainability in Africa is a commitment by 14 sub-Saharan African nations to develop sustainably by, for example, infusing natural capital accounting into their national development plans. CI officially became the Secretariat of the Gaborone Declaration in Dec. 2014 and the Declaration was incorporated into the 15th sessions of the African Ministerial Conference on the Environment Cairo Declaration in March 2015.

¹⁸² (<https://www.decadeonrestoration.org/>)

¹⁸³ (<https://afr100.org/content/across-africa-restoring-land-climate-action>).

gathered science, the approach will reduce emissions and engage and improve the livelihoods of communal livestock farmers by regenerating landscapes, improving livestock productivity, and reducing human-wildlife conflict.

- 134.** A degradation baseline and spatially explicit restoration plan for each site will be created as a requisite component of the RSA. The baseline and plan will be undertaken in the same year as signing of the Rangeland Stewardship Agreements to ensure that the plan and techniques applied are able to learn from implementation at demonstration sites and any new scientific or practical materials. The plan will be developed with the farmers and Village Development Committee during project engagement activities (Activity 1.1.3) and modified based on the annual monitoring and climatic conditions of the year (Activity 1.4.1) to ensure actions taken are optimal for the prevailing conditions. CI will ensure that all plans are compliant with ESS considerations and global best practice prior to finalization.
- 135.** The success of this Component depends on executing Rangelands Stewardship Agreements with affected communities in which they agree to site-specific good practices incentivized by improved livestock production and training support that are sustained through access to new markets for livestock. Investments by the government and the GCF into this component will provide the tools and capacity to overcome barriers to collective management for climate resilience, contribute to GCF Framework Outcomes, and improve monitoring capacity of such interventions to respond to future climate change: Improved management of land or forest areas contributing to emissions reduction (M9), and Strengthened adaptive capacity and reduced exposure to climate risks (A7). To achieve these goals, specialist herders, called Ecorangers, will be trained to implement livestock management practices that align with ecological needs and meet trade protocol compliance. Restoration Workers will receive additional technical and life skills training (see Feasibility Assessment Section 4 and Output 1.3). Through the re-purposing of *Ipelegeng* for the implementation of this component, the Project will also contribute to new GoB goals for this programme within its National Development Plan to “move people from low productivity to higher productivity activities; and monitor productivity through improved productivity data.”



Figure 20. Rangeland restoration is at the centre of the transformational change process.

136. The activities under this component support the following Outputs:

2.1. Job creation and social safety net programmes resourced by the Government are used to deploy restoration teams for climate-resilient land and livestock management in target Project areas;

2.2. Rehabilitation of ecosystems and improved management of land, soil, and livestock implemented to increase ecosystem productivity, reduce vulnerability of beneficiary populations, and reduce GHG emissions on 4.6 million hectares of climate-vulnerable communal rangelands.

Output 2.1: Job creation and social safety net programmes resourced by the Government are used to deploy restoration teams for climate-resilient land and livestock management in target Project Areas. *Key deliverable:* At least 3,600 women and 2,400 men deploying new livelihood strategies (skills and employment) related to climate resilient land and livestock management.

Activity 2.1.1 Implement inclusive and gender-equitable recruitment, deployment, and in-service Training of Ipelegeng Ecorangers, Restoration Worker Teams, and Graduate Monitors as part of Rangeland Stewardship Programme.

137. In 2016, the Office of the President Poverty Eradication unit suggested that the employment investment co-finance for a rangeland stewardship project should be at least 10% of total *Ipelegeng*¹⁸⁴ in order to test implementation and transformation of the programme. *Ipelegeng* was employing 60,000 people per month and as a result, the project proposal development team presented a target of 6000 individuals for involvement in the Project via *Ipelegeng*¹⁸⁵ employment. At the same time during concept development, the director expressed that because the majority of *Ipelegeng* beneficiaries are women, most beneficiaries should be women and a target of 60% of all individuals supported via the co-finance was set at 3,600 women. From *Ipelegeng*, a total of 5,500 individuals will become Ecorangers and Restoration Workers (the breakdown of which will be identified per Village Grazing Area through activity 2.2.1.) and 500 graduate monitors that will be deployed via Activity 2.1.2 on all activities described in Output 2. These targets provided the framework for consultations on how to ensure equitable employment opportunities with government, VDC, traditional authorities, farmers, and broader communities (see Annexes 6, 7, and 8). PPF consultations revealed significant concerns about women being Ecorangers both for their own safety, but also given their household responsibilities. For this reason, the Project includes Restoration Workers, which can include individuals who need to work from home or, at least return home at night, and can be paid for task-based activities such as sewing of restoration mats, filling of erosion gullies, thinning of bush encroachment, or ponding of sheet erosion. This activity will be carried out according to the *Ipelegeng* Rangeland Stewardship Programmes as designed in Output 1.2 and to comply with conditions in this project ESMP and GAP. As such, Ecorangers and Restoration Workers will be recruited based on application submissions from the VDCs in target communities; applications will be completed with the support of the Farmer Facilitation Teams. Necessary contractual

¹⁸⁴ Project Concept Letter of Co-finance Commitment from the Government of Botswana

¹⁸⁵ The 2012 BIDPA review calculates that 80% of *Ipelegeng* beneficiaries are women.

arrangements, medical pre-checks, procurement of personal protective equipment and tools for the work will be completed within 60 days of receiving the application for *Ipelegeng* employees from the VDC. Employee land and livestock work assignments completed under this activity are described in detail in the Annex 2 Feasibility Assessment Section 4.

Breakdown of Ecorangers and Restoration Workers per Phase (excludes Graduate Monitors)	Number of Sites	Number of EcoRangers and Restoration Workers per Phase	Cumulative Total
Project Demonstration Phase (Yr 1-2)	9	500	500
Project Priority Phase (Yr 3-5)	32	1500	2000
Project Amplification Phase (Yr 6-8)	60	3500	5500

- 138.** *Ipelegeng* employees will receive induction training on their rights and obligations in two-day training sessions held in the community during the first 60 days (as required by Social & Labour laws of Botswana). Basic household information, as well as their knowledge of climate change and response strategies, will be gathered from the employees during this first induction. The induction process will be mandatory every year for all employees to accommodate shifts in legislation and/or known best practices. This mandatory meeting will also enable consistent data collection on any change in vulnerability or resilience to climate change impacts in the households of the *Ipelegeng* employees.
- 139.** BUAN-CICE trainers will implement trainings at the Ministry of Agriculture's training facilities in each district in short-course format to build core skills in restoration techniques and regenerative grazing practices. The training curriculum will be developed under Output 1.3. The training will be delivered to 6,000 Ecorangers, Restoration Workers, and Graduate Monitors as part of the *Ipelegeng* Rangeland Stewardship Programme (funded by GoB co-finance). This training is separate from the training activities to be implemented under Activity 1.2.2. Work-site management, occupational health and safety, and life-skills will be included with a set of core technical competencies to be developed in Year 1 of the project in Output 1.3. A facility use and training agreement will be developed between BUAN-CICE and MoA to implement this training.

	Y2	Y3	Y4	Y5	Y6	Y7	Y8
Number of Ecorangers and Restoration Workers employed and remunerated	500	2,000	2,000	2,000	5,500	5,500	5,000
Number of Ecoranger and Restoration Worker annual training fees paid	500	2,000	2,000	2,000	5,500	5,500	5,000
Number of Graduate Monitors remunerated	50	200	200	200	500	500	450

Activity 2.1.2. Create and deploy Graduate Monitors¹⁸⁶ to measure compliance and gender-equitable impacts and support Rangeland Stewardship Information Portal and BAITS data management and use for enhancing local emissions mitigation and adaptive management capacity.

140. A graduate internship programme will be designed and implemented by CI, funded and administered by the MoA / *Ipelegeng* to deploy 500 government internship trainees in studies and work experience across the nine Project area clusters¹⁸⁷. The Department of Animal Production, the Department of Range, Forestry and Fisheries, BUAN Natural Resource Management, Okavango Research Institute, and a network of supporting NGOs, as well as the CI Project team, will host Graduate Monitors and provide mentorship and oversight during the Project as part of the “grazing support package” (Activity 2.2.1). A specific activity for the Graduate Monitors will be to deploy and track experiments and monitoring of emissions reductions and improvements in soil carbon, soil moisture content, and water quality as guided by the Project monitoring protocols (Activity 2.2.3). All 500 Graduate Monitors will complete the same life-skills training that is provided to the Ecorangers and Restoration Workers.

Output 2.2.: Rehabilitation of ecosystems and improved management of land, soil, and livestock implemented to increase ecosystem productivity, reduce vulnerability of beneficiary populations, and reduce GHG emissions on 4.6 million hectares of climate-vulnerable communal rangelands.

Key deliverables: Improved management of 4.6 million ha, achieving improved resilience of 3.7 million ha (80% effectiveness), a reduction in loss of livestock assets by vulnerable communal farmers, and an average annual reduction of 587,937 tCO₂e¹⁸⁸ from both reduction in enteric emissions and increased sequestration from rangelands.

Activity 2.2.1 Complete baseline ecological and social assessments according to ESMP and GAP recommendations and international best practices.

141. Farmer facilitation teams will work with CI rangeland science and gender specialist support to develop a baseline assessment and recommendations for a three-year grazing plan to inform the development of Village Grazing Area Rangeland Stewardship Agreements. Baseline data will consist of remote sensing and ground-truthed data on carrying capacity and climate-induced degradation indicators as well as household surveys on climate adaptive capacity. The outputs of this activity will be 104 VDC Grazing Area Baseline Assessments completed and stored in the Rangeland Stewardship Information Portal and as VDC Rangeland Stewardship Agreement Annexures.

Activity 2.2.2. Implement community-based climate-resilient planned grazing, restoration, water and soil, and fire management in 104 VDC grazing land target sites.

¹⁸⁶ Based on feedback provided at a meeting with the National Strategy Office (see Annex 7 for meeting records), a category to provide more opportunity for youth engagement was recommended for environmental and social monitoring and other record-keeping is required for BAITS and enabling Commodity-based Trade.

¹⁸⁷ Implementation arrangements subject to MoA determination / confirmation.

¹⁸⁸ Annual emissions presented as the per year emissions equivalent for the 8-year Project period

- 142.** CI will use an in-kind grant agreement to provide technology and equipment¹⁸⁹ for VDCs, NGO partners, Ecorangers, and Restoration Teams to use to implement the agreed Rangeland Stewardship Agreement. These “Grazing Support Packages” will be based on a standard set of equipment per 600 animals including a predator-proof livestock enclosure, Ecoranger uniforms, mobile accommodations, mobile water solutions, monitoring technology, as well as routine maintenance.
- 143.** CI will enter into an in-kind grant agreement with a grantee organization—NGO, CBO, or farmers’ association—in each target community. The in-kind grant agreement will define the goods to be provided to the grantee and terms of use of the goods, including CI and GCF terms and conditions (AMA and FAA). Per these agreements, CI will procure the durable goods for the Grazing Support Packages from vendors (in accordance with its own procurement policies and procedures) and deliver them to the grantee organization. Per the terms of the in-kind grant agreement, CI will transfer the goods to the grantee organization, which will be required to maintain and distribute the goods to implement the plan included in the RSA, monitor the use of the goods, and provide monthly activity monitoring reports. No funds are transferred to the grantee NGO/CBO/association.
- 144.** Project M&E and Farmer Facilitation Teams will undertake spot checks on treatment of the equipment procured as part of the in-kind grant agreement (Grazing Support Package, see Table 14 and Figure 18b) and will determine if the terms of the agreement are not met, including gender equity targets. Non-compliance will result in the reassignment of goods procured as part of the Grazing Support Package, as agreed in the terms of the Rangeland Stewardship Agreement. Beginning in Year 7 of the Project, disposition and maintenance plans will be developed by the Farmer Facilitation Teams and approved by CI. With GCF concurrence, the support package may be handed over to a VDC or implementing NGO at the end of the Project based on the value of their successful participation in the Project reporting process and demonstrated motivation and capability to maintain it.

Table 14: Components of a Grazing Support package, which will be provided through an in-kind grant with CI that formally commits the negotiated benefits associated with a Rangeland Stewardship Agreement (see Figure 18). The Agreement will outline the specific numbers, types, and operational requirements provided for the purpose of village-level delivery of climate-resilient actions on communal rangelands (as per Table 12). Components of the Grazing Support package are funded both by the Government of Botswana and the GCF for a three-year period. After the three years, the grant agreement will be re-visited and re-negotiated based on new needs assessment to adjust to these needs and to move the agreement into a scenario where they are self-sustaining or for a maximum of six additional years¹⁹⁰.

Component	Description
Labour support	<i>The number of Ecorangers, Restoration Workers, and Graduate Monitors allocated to the specific RSA for implementation support of its restoration and grazing plan for the year:</i> The number of workers selected for a Village Grazing Area will be based on the site restoration needs and agreed with the VDC for a three-year period to be included in their annual allocation. At least three graduate monitors will be posted to each site to provide expertise on ecology, agriculture, and gender. Additional monitors may be included based on the interest of the community and approval by the VDC and MoA Rangeland Stewardship Programme. Operational requirements will include an enhanced recruitment, training, and assessment process designed in Activity 1.2.2 and supported through Activity 2.1.1-2 and based on best practice of the H4H programme. The wage component for labor

¹⁸⁹ See Feasibility Assessment Section 4 and Procurement Plan for details.

¹⁹⁰ See Annex 2 Feasibility Assessment, Section 5 Market Assessment and Sustainability Plan

	will be paid directly to the employee as per normal <i>Ipelegeng</i> modalities by the Government of Botswana and shared with CI for co-finance tracking via payroll reports on a monthly basis. ¹⁹¹
Personal Protective Equipment and Work Tools	<i>PPE and work tools for Ipelegeng Ecoranger and Restoration Worker Assignees:</i> Each RSA Grazing Support Package will include PPE and Work Tools for their <i>Ipelegeng</i> assignees from the project. The budgeted PPE is for an annual allocation of clothing, and a three-year allocation of outerwear, boots and tools. This is based on South Africa's Natural Resource Programme Norms and Standards for PPE as well as CI's experience in implementing those standards. This allocation of goods is from the GCF budget and any tools and/or unused PPE will be provided to the Ministry of Agriculture Rangelands Stewardship Programme for deployment based on need or for replication after the Project period. Inventory analyses will be carried out throughout the Project and different suppliers trialed and performance reports consolidated for the Ministry of Agriculture.
Rangeland Management Equipment	<i>Mobile livestock management (predator-proof enclosures, vaccinations, renewable-energy powered refrigerators, bush-fodder grinders, and mobile water bowsers (trailers):</i> Each RSA Grazing Support package will include a site specific sub-set of the available goods to be provided by the Project based on need and context. The purpose of the demonstration sites and the first round of deployment sites is to determine what works best and where. No fixed infrastructure is required, and the RSA will describe the O&M requirements and process based on the best options CI can secure through the procurement process. With GCF concurrence at the end of the project, the Project will transfer equipment to the VDC for all communities who have been compliant with the RSA or will return to the MoA Rangeland Stewardship Programme for re-deployment according to best practices and lessons learned ¹⁹² .
Rangeland Management Wi-fi Hub for Monitoring and Reporting	<i>Solar-powered Wi-fi hubs:</i> New solar-powered Wi-fi hubs will be included as part of the grazing support package to provide climate-related updates, remote restoration and grazing management support, and enable timesheet monitoring of labor support (see Activity 1.4.2 for more details).

145. Managed by the CI Project Implementation Director working with the partners in the Farmer Facilitation Teams and the MoA District Rangeland Stewardship *Ipelegeng* Project Coordinators, CI will coordinate resources to transform current practices and design, support, and oversee restoration teams and collective grazing on communal land delivered by *Ipelegeng* employees.

146. Ecorangers and Restoration Workers will be engaged in bush thinning, erosion management, seed collection, and other soil, vegetation, freshwater system regeneration, as well as fire-break activities (see Table 12). The selection, training, and engagement of these employees is described in Activity 2.1.1., whereby the VDCs facilitate, CI approves, and the GoB *Ipelegeng* programme administers utilizing the legislated *Ipelegeng* regulations and the Project criteria. *Ipelegeng* Ecorangers will monitor and manage cattle movements, nutrition, water management, non-lethal predator management, animal health, and market access activities (via low-stress herding support and record-keeping). The Director and the Farmer Facilitation Teams will host farmer and community "how is it going?" monthly meetings at demonstration sites in years 1 and 2; expand to priority sites (quarterly

¹⁹¹ The Government of Botswana will also be required to provide periodic financial reports on co-financing to CI for the project.

¹⁹² It should be noted that in comparable programmes in South Africa and Ethiopia, PPE guidelines are regularly tested and updated as working conditions and available materials change regularly. For example, new PPE is required to respond to risks associated with Covid 19. It is expected that this will happen during and after this Project as well in which case adjustments in types of PPE procured may be re-prioritized.

meetings) in years 3-5; and amplify to all sites in years 6-8. FFTs will mediate if/when issues arise with farmers and the Ecorangers and Restoration Workers. All stakeholders will be encouraged to contribute to the Village Grazing Area Rangeland Stewardship and Climate-resilient Livestock Production Community Diaries as participatory documentation of Project implementation for 104 communal grazing areas. The diaries will include before/after photos, experiences and lessons learned, and will be held by the VDC as a scrapbook or set of scrapbooks. Graduate Monitors will be provided with tools and training to start VDC level websites, so documentation is electronic as well as physical¹⁹³.

Activity 2.2.3. Monitor and analyse changes in ecosystem health and livestock emissions for adaptive management and emissions reduction reporting.

- 147.** The Project Planning and Adaptive Management Director (CI staff) will be responsible for establishing a representative Technical Advisory Group of local, national and global monitoring and evaluation (M&E) experts, who will support the development and implementation of a semi-automated monitoring and evaluation system using ICT. This will be 35% of the Technical Director and 80% of the scientific team's responsibilities. Mobile applications and cluster-level mini-weather stations and rain gauges used by Ecoranger and Restoration Teams/Team Leaders will ensure near real-time monitoring of rehabilitation and livestock management activities. Weather and precipitation data will be shared with the Botswana's MET.
- 148.** Project area M&E officers and the Department for Forest and Range Resources will ground-truth incoming data and undertake basic measurements and analysis at representative control sites. The percentage of bare ground within the grazing area will be a seasonally tracked proxy indicator of improvement in adaptive capacity and improvement in soil carbon sequestration capacity of the Project grazing areas and these controls¹⁹⁴. The Impact Monitoring System will measure and report on this and other key GCF indicators of GHG emissions reduction, increased resilience of vulnerable people, and increased resilience of ecosystems¹⁹⁵. Performance of the Ecorangers and Restoration Workers will be monitored through automatic time-logging in the monitoring application utilised by the programme. Through an employee assignment linked to a particular rangeland grazing area, labour performance against targets will be made quantifiable, evidence based, and spatially explicit. Prototypes of the Impact Monitoring System will be tested in years 1 and 2 utilising existing Herding for Health technologies. This monitoring information will be available on the national Rangeland Stewardship Information Portal by year 3. Independent evaluations by professionals at the University of Botswana who have carried out previous assessments of *Ipelegeng* will also be implemented under this activity in years 2 and 5. Reports on impact will be generated annually from year 3, allowing time for baselines and technology training in years 1 and 2.
- 149.** Monitoring system equipment will be managed by Ministry of Environment Dept of Forestry and Range Resources (DFRR) and MoA (note that there are ongoing talks - DFRR may be moving back into MoA which would allow for more mainstreamed system management) as part of the Integrated Rangeland Stewardship Portal system. Details of the Operations and

¹⁹³ <https://www.conservation.org/south-africa/video?ytVideoid=r14ivmgPp7M>.

¹⁹⁴ Waters et al, 2015. The relationship between soil organic carbon and soil surface characteristics in the semi-arid rangelands of southern Australia. *The Rangeland Journal* 37(3) 297-307.

¹⁹⁵ See Annex 11 for Project Impact M&E Framework

Maintenance (O&M) will be completed during the development phase for the system (Activity 1.3.1) after the political movements have been finalized.

- 150.** Complimentary to the overall M&E system, CI will implement an Impact Evaluation (IE) to better determine project-attributable impacts on the resilience of targeted populations and reductions in GHG emissions from livestock and increased rangeland sequestration¹⁹⁶. This IE will be led by CI's Moore Center for Science with significant input and support from Project staff, government, partners, and beneficiary populations. The IE will rigorously compare adaptation and mitigation outcomes of control sites where Project interventions are not taking place with outcomes in the Project target areas and communities. By analysing data on livestock health, offtake/death/reproduction rates, as well as measuring soil carbon and rangeland ecosystem services in control and target areas, the Project will be able to better determine which interventions are most effective and continually update its approaches to best serve beneficiary populations. The IE team intends to also work with StatsBotswana to investigate positive and negative spill-over effects into the broader Project Area population, particularly to measure the income resilience generated from reduced loss of assets and increased ecosystem service benefits from this Component or economic beneficiation stemming from the value-chain activities undertaken under Component 3 described below. The full methodology of the IE will be developed during the first year of Project implementation while preparatory activities are underway. See Annex 11, M&E plan for more information.

Component 3: *Promoting climate-sensitive enterprise development and value-chain investments to sustain transformational change*

- 151.** Government and GCF investments in rangeland stewardship for climate change resilience building are catalytic in nature. Sustaining and growing adaptive capacity requires aligning value-chain incentives and supply-chains for rangeland products that are also resilient to the impacts of climate change. Price drivers and demand constraints for such products and services are complex¹⁹⁷, and promoting new value-chain development opportunities for Project beneficiaries and expanding the use of climate-resilient technologies and approaches amongst economic activities, such as those presented in Table 12, will enhance adaptation and mitigation outcome sustainability in the Project areas as well as more broadly in Botswana. While access to the EU market remains exclusive to the Botswana Meat Commission, recent lifting of Foot and Mouth Disease (FMD) regional trade barriers provide new, but underdeveloped supply chain opportunities in southern Africa and several smaller abattoir operators are already operating exports into DRC, Angola, and South Africa. The Project enterprise manager will support private sector partners to expand these and other new market access channels and ensure they contribute to the sustainability of the Project activities by working closely with Ministry of Agriculture, Meat Naturally, CEDA and others under the activities in Component 3.
- 152.** Component 3 will leverage Project lessons into value-chain and finance policy transformation to support the demand side of Project interventions and the overall sustainability of the Project. This component will expand the Project contribution to the GCF

¹⁹⁶ See Galvin et al, (2001) Impacts of climate variability on East African pastoralists: linking social science and remote sensing. Climate Research. Vol 19, pp 161-172 for an example of integrated household and remote sensing impact assessment.

¹⁹⁷ See Annex 2 Feasibility Assessment, Section 5 Market Assessment and Sustainability Plan

outcome, “Strengthened adaptive capacity and reduced exposure to climate risks (A7)” through improved incomes and value-chain participation related to the restored rangelands and improved livestock management of Component 2 and tangible benefits from “Strengthened awareness of climate threats and risk reduction processes (A8)”. Business interest in direct engagement with the Project is expected to grow as improvements in the quantity, quality, and consistency of livestock products increase through the Project phases. In the Foundation Phase (Year 1 and 2), existing 5% offtake rates across the 9 sites will likely continue, as CBT requirements will not yet be fully implemented/met. Current supply of carcasses for local consumption, culled from older, unproductive animals, is far below demand of 70 carcasses per day (25,550 per year) currently sold across the three target districts for local consumption. Even in the Foundation phase, while prices paid will be lower than for export, the absence of any convenient market access means that increased market access and amenable payment terms will be a sufficient incentive to catalyse farmer participation in the Project’s RSAs, according to consultations with area farmers¹⁹⁸. The beef produced in the first year of implementation in each village area will likely only be acceptable for local consumption or dried or cooked product (biltong, snapstix, droewors, and pies) for the tourism sector. Meat Naturally’s scale of operations is suitable for this market.

- 153.** Engagement and cooperation with the private sector, particularly the commercial farming sector and local abattoirs, will build on alignment of existing and planned work of Herding for Health and its partners already active in developing communal area production protocols for livestock value chains. A Project Enterprise Development Manager (CI staff) will convene and work across four critical entry points to provide technical assistance and promote shifts across rangeland product value-chains to encourage adoption of actions that are responsive to the threats of climate change. The Project entry points are National Strategy Office (NSO and Ministry of Agriculture) Grassfed Beef Cluster, Botswana Meat Commission (BMC) and other licensed export abattoirs and butcheries (5 currently in operation), Citizen Enterprise Development Agency (CEDA) and its sister institution the Local Enterprise Authority (LEA), and Meat Naturally Botswana and the rationale and an overview of the anticipated engagement is described in Tables 15 and 18b. LEA, CEDA, and BMC are national institutions with significant outreach experience and capacity. The MoA is driving several relevant awareness and grassfed market development initiatives, and Meat Naturally Botswana is a social enterprise association that emerged from CI’s work with Ecorangers and Rangeland Stewardship Agreements in South Africa and remains a core partner of Herding for Health in providing market access incentives and innovative financial flow models for communities involved in climate smart livestock management¹⁹⁹.

Table 15: Critical economic entry points the project will use to secure shifts that will sustain restoration of degraded communal rangelands and continual improvement of land and livestock management for lowering GHG emissions.

Entry Point	Engagement Strategy
National Grassfed Beef and CBT Policies	CI will work with the MoA to undertake key policy engagements and government strategy development support related to Grassfed Beef and CBT and ensure that climate-smart practices and standards for emissions, livestock management, climate-smart breeds, and participation in Rangeland Stewardship Agreements are integrated into relevant regulations.

¹⁹⁸ See Annex 2, Appendix 5.6, pgs 17-18.

¹⁹⁹ Ibid

<p>Botswana Meat Commission and other Industry Players</p>	<p>CI will engage with key industry bodies, all five export abattoirs, and all local authority abattoirs and butcheries in regular meetings and co-hosted events with DVS that promote climate-smart practices and standards to reduce emissions, promote climate-smart breeds, and incentivize participation in Rangeland Stewardship Agreements as part of value-chain development.</p>
<p>Citizen Enterprise Development Agency (CEDA) & Local Enterprise Agency (LEA)</p>	<p>CI will work with the CEDA, a public-private investment vehicle, to develop loan criteria that promote and incentivize climate-smart practices and standards for emissions, climate-smart breeds, and participation in Rangeland Stewardship Agreements as part of risk assessments and financing incentives. Via the CEDA, CI will also integrate climate-resilience awareness and training into the enterprise development trainings rolled out by the LEA. In the project areas and the entrepreneurs recruited and trained by LEA will facilitate a critical component of the deliverables under Activity 3.1.1. See letter of support from CEDA – Annex 26.</p>
<p>Meat Naturally Botswana</p>	<p>CI will continue to work with Meat Naturally as a strategic partner and secure the involvement of the communal farmers in the Project in the business shareholding / structures. Through Meat Naturally, the farmers will be able to participate in formal markets based on their adoption of better land and livestock management practices that contribute to climate change adaptation and mitigation outcomes, and this engagement will facilitate a critical component of the deliverables in Activity 3.1.1. Meat Naturally will also be a critical partner for the development of other payments for ecosystem services (PES) and engagements with the carbon and eco-agri-tourism markets.²⁰⁰</p>

154. Representatives of these entities will serve as the Project’s Enterprise Development Committee (EDC) to provide guidance and market development functions for the delivery of Component 3 as well as the Exit and Sustainability Strategy (detailed in FP section B6). A representative of the Department of Gender Equity will also participate in this committee to ensure gender issues are considered in all EDC activities. Additionally, the Enterprise Development Manager will regularly connect with additional civil society and private sector entities, farmer association leadership, and funders to leverage additional activities and support for rural economic development around livestock value-chain development in the target regions. The Enterprise Manager will also actively develop opportunities for tourism industry participation and facilitate investment into the broader local economic development activities in the target districts with partners in the Botswana Wildlife-Friendly Beef Forum.

155. There will be no financial payment to the organizations referenced in Table 15, with one exception: CI will separately engage Meat Naturally with a legally binding services agreement to develop cluster-level business plans for sub-activity 3.1.1. that identify the most viable value-chains for development given herd size, livestock condition, and village farmers’ target offtake levels.

The activities of this component contribute to the Project’s sustainability through the following outputs:

3.1. Market readiness trainings, enterprise development support, supply chain facilitation, and establishing local-level funds that build the enabling conditions for sustainable low-emission livestock value chains;

3.2. Selected financiers and value-chain players are aware and supported to incentivise rangeland stewardship and adopt carbon-optimisation practices and technologies.

Output 3.1. Market readiness trainings, enterprise development support, supply chain facilitation, and local level funds build the enabling conditions for improved low-emission livestock value chains and regional economic resilience. Key deliverable: At least 176,000

²⁰⁰ See Feasibility Assessment Section 5 for details.

(95,000 females; 81,000 males) individuals who are dependent on communal livestock farming. beneficiaries will benefit from new income and livelihood strategies as a result of the Project activities. An additional 71,000 individuals living in the Project areas are expected to have reduced income impacts as a result of climate impacts on the farming economy, leading to 247,000 total direct beneficiaries. This represents ~80% of the population in the Project areas directly benefiting from the Project activities.

Activity 3.1.1. Facilitate new income generation, savings opportunities, and local level funds especially from innovative CBT for livestock purchase from communal farmers active in Rangeland Stewardship Agreements for long-term resilience and sustainability.

- 156.** CI will enter into a legally binding services agreement with Meat Naturally Botswana to develop Cluster-level business plans (nine plans) to identify the optimal market access strategy for each cluster. Cluster level business plans will also be used to identify and secure the optimal training support for enterprise and value-chain development in a particular area based on site-specific characteristics, trade opportunities, and barriers. The Partners mentioned in Table 15 will receive the cluster-level business plans to design coordinated enterprise training support as part of the collaboration agreement. Meat Naturally will draw on extensive learnings related to mobile auctions, mobile abattoirs, and bush fodder business development and arrangements related to the establishment of Herders Funds (please See Annex 2, Section 4 for more details). Through the Service Agreement, Meat Naturally will also be tasked to engage with Botswana Meat Commission and other value-chain actors to understand their capacities and willingness to expand livestock purchases and value-addition from communal cattle where Rangeland Stewardship Agreements and data available on the Information Portal provide new traceability for animals from communal rangelands. CI staff will utilise this information to engage at least 50% of all existing value-chain actors in the target regions (i.e., four abattoirs/livestock buying businesses) in offtake arrangements from farmers compliant with their RSAs. CI will also contribute expertise to the Cluster-Level Business plans on other PES opportunities for Project participants/beneficiaries to receive financial rewards for wildlife conservation outcomes that will contribute to the sustainability of RSAs and Ecorangers.
- 157.** CI's Enterprise Development Manager will work with FFTs and a consultant to implement market-readiness training across all VGAs based on the recommendations of the cluster-level business plans. Over the nine years, an estimated 96,000 beneficiaries will receive training related to red meat markets and/or enterprise development that incentivises sustainable, low-emissions land and livestock management. This education is critical, as both the AHEAD GAP analysis for Ngamiland (Annex 2, Appendix 5.6) and Meat Naturally's Feasibility Assessment for Bobirwa area (Annex 2, Appendix 5.3) show that lack of understanding and trust of pricing is a critical barrier for private sector purchase agreements.
- 158.** No GCF grant resources will be provided to Meat Naturally for any commercial activities related to livestock sales; however, CI will collaborate with Meat Naturally Botswana to enable practical logistics and labour support in trial sales/productions via Ecorangers and Restoration Teams in the target communities. Meat Naturally social enterprise structure ensures participating farmer groups receive income from both the sale of cattle to MNP as well as receiving a revenue share from Meat Naturally to compliant farmer's associations that will be used to fund Ecorangers' wages and career development opportunities that can

sustain climate-resilient value chains after the life of the Project. In South Africa, participating farmers associations make contributions from sales to Meat Naturally to village level Herder Funds to further contribute to financial sustainability of the Ecoranger model²⁰¹. It is the cooperative-like business structure, and the further resilience generated by profit-share, that makes Meat Naturally the preferred sector partner for the Project. However, CI will not exclusively engage Meat Naturally, and will cultivate offtake arrangements with all private sector parties in the sector to ensure that incentives for RSAs are not fully dependent on Meat Naturally. In addition, by Phase 3, the capacity of Meat Naturally as a moderate-throughput abattoir operation will likely be exceeded. Improved conditions of quarantine facilities and management by Ecorangers of these facilities will enable larger quarantine operations for finishing and slaughter by BMC and others by Phase 3. As quality and record-keeping is established, larger abattoirs and BMC will be able to offer export prices to interested farmers involved in the Project. The Project will support farmers with the BMC registration process (<https://bmc.bw/producers/>) based on the records maintained by the Ecorangers, and the supply chain will be enabled as per standard BMC procedures and transport. Arrangements with the other abattoirs will be developed by the Enterprise Development Manager as supply and demand conditions warrant.

159. Due to Meat Naturally Botswana's partnership with Herding for Health and the tracking of all livestock sales data through the BAITS system, the Project will also have access to income improvement data per household over time via sale records stemming from this activity which will contribute significantly to Project M&E²⁰², the Project Impact Evaluation, reporting, and creating opportunities for analysis within the Rangeland Stewardship Information Portal.

Activity 3.1.2. Build and improve understanding of regional economic resilience from expanding participation in business initiatives which enable, complement or are based on climate-resilient livestock production and associated financial flows.

160. CI will implement gender and age-responsive interventions that target rural young people (ages 18-35) and marginalized groups and build technical and entrepreneurial skill sets relevant to building greater climate resilient rangeland ecosystems and rural economies. Female participation will be particularly targeted for development through this component. A recent World Bank study showed that female entrepreneurship has a high degree of success in Botswana, providing evidence that such an approach is likely to provide long-term benefits for female Project beneficiaries²⁰³.
161. A set of potential income generating or business development opportunities is provided in Feasibility Assessment Section 5 and range from development of inputs for the livestock value chain such as fodder gardens, bush fodder production, livestock transport services, and opportunities for those creating products benefiting from improved animal condition and ability to locally process - including leather products, meat processing, and waste management. The Project Enterprise Development Manager (CI Staff) will investigate site-specific opportunities to develop these activities with local representatives of the Local

²⁰¹ See Feasibility Assessment - Section 5 Market Assessment and Sustainability Plan for more detail.

²⁰² Ibid

²⁰³ Cherchi, L. and D Kirkwood. 2019. Crossovers in Botswana: Women Entrepreneurs Who Operate in Male-Dominated Sectors. Component of World Bank Women and Entrepreneurship Study. Accessible at <http://documents.worldbank.org/curated/en/290451565250128807/Crossovers-in-Botswana-Women-Entrepreneurs-Who-Operate-in-Male-Dominated-Sectors-Output-for-Women-Entrepreneurship-Study>.

Enterprise Authority (LEA), Citizen Enterprise Development Agency (CEDA), Meat Naturally Botswana and others.

- 162.** Trainings for interested individuals will be supported by these partners based on their assessment of long-term business viability. By making small, medium, and micro-enterprise (SMME) development a function of business partners rather than a Project intervention, there will be a greater likelihood of success via ongoing mentorship and support beyond the life of the Project. This activity will be leveraged via the involvement of Ministry of Agriculture Livestock Management and Infrastructure Development (LIMID) programme, which has a focus on female farmer development and small stock promotion, as well as investments by CEDA and potentially others identified by H4H in the AFD project. With this approach, these Project partners will also see a return on their investment in communities that will encourage them to scale activities in other non-Project communal rangelands as agents of change for climate resilience throughout the country. At least 17,000 individuals and their dependents in the target communities will benefit from this activity.
- 163.** Finally, CI will collaborate with StatsBotswana to calculate broader regional economic resilience indicators to better measure the impact of climate change on rural economies and the impact of the Project interventions. This will also build the capacity of StatsBotswana to gather improved data on the socio-economic conditions in vulnerable regions of the country and contribute to national policy development across sectors.

Output 3.2.: Selected financiers and value-chain players are aware and supported to incentivise rangeland stewardship and adopt carbon-optimisation practices and technologies. *Key deliverable:* Key behaviour changes and new financing protocols encourage communal farmer participation in formal markets and bring economically-viable, climate change resilient production systems.

Activity 3.2.1. Design, implement, and measure impact of an awareness campaign on climate-change, low-emissions productions, and Rangeland Stewardship production with broader red-meat value chain, including consumers

- 164.** The Project will run an information and awareness campaign aimed at generating commercial farmer understanding, appreciation, and willingness to hire and engage with Ecorangers and Restoration Teams, trade-partner support to reward communal farmers in Rangeland Stewardship Agreements, and increase consumer interest in meat coming from the target community rangelands. Campaign strategy development will be supported through a sub-grant to the non-profit Rare to ensure these strategies are based on the science of behaviour change and are designed and implemented in a way that enables impact measurement. The campaigns will be run at local and national levels using an appropriate mix of communication channels. Rare will also design and implement baseline, mid-term and final assessments to ensure the campaign is reaching key segments of the broader red-meat value chain.

Activity 3.2.2. Develop and embed rangeland stewardship within climate-resilient livestock production and financing protocols for the industry

- 165.** In collaboration with ongoing NSO, FAO, GIZ, and European Union-supported efforts, the CI and project partners, to be identified and selected at the cluster-level during Project implementation, will contribute criteria and case-studies for value-add certification of market segmentation from “climate-friendly meat” and associated livestock products (horns, leathers). These cluster-level partners will not be procured parties but are organizations who will engage with communities to support development of value chains for low-emissions livestock products; no transfer of funds will take place from CI to these partners. CI will engage a consultant team to produce a review of technological and financial opportunities related to building climate change resilience in the red meat value chain (e.g., certification of climate-resilient production, adoption of renewable energy, water-saving technologies and pricing strategies to incentivise climate-resilient livestock production—see Table 12) to both ensure a consistent market for Project beneficiaries as well as improve certification schemes to include all value chain actors and expand mitigation opportunities.
- 166.** The report will be made available publicly and shared with relevant private-sector stakeholders via a launch workshop and follow up meetings with key government stakeholders, particularly the Botswana Meat Commission, the CEDA, and the Local Economic Agency (LEA) all five export abattoirs, and two domestic abattoirs within the Project areas. To address the specific barrier of market access from Foot and Mouth Disease Zones of the Project target sites, CI will support Department of Veterinary Services to focus on the development and implementation of additional criteria for Commodity-Based Trade protocols that recognise new climate realities. Convened by the DVS CBT Director CI will use Project funds to provide for the meeting costs and will provide meeting documentation support to the DVS for the policy-implementation dialogue meetings to ensure criteria are understood and implementable by Farmer Facilitation Teams, farmers, and by trade stakeholders such as OIE and BMC. The CBT protocol will be made publicly available and shared with CEDA who will also be supported by the DVS CBT Director and the Enterprise Development Director to integrate production regulations into a requirement for financing applications for livestock farming throughout the country. In this way, the Project will unlock opportunities for communal farmers, but also establish a proactive plan to influence climate-resilient livestock and wildlife disease management practices throughout the country.
- 167.** The project will work with CEDA and LEA staff to ensure the risks and opportunities identified in the study are integrated into incentives and prioritisation strategies for future investments both within the Project areas and nationally. These will be monitored and evaluated through a comparison of average return on investment (ROI) from CEDA investments in the Project Areas compared to both historic and control-site investments in the livestock product businesses as part of the Project impact evaluation (see Annex 11).

B.4. Implementation arrangements

- 168.** The GCF National Designated Authority (NDA) will ensure that activities implemented by the Project align with strategic national objectives and priorities including Climate Change Response Policy and help advance ambitious action on adaptation and mitigation in line with national needs. The NDA will be engaged throughout Project implementation and will be provided with detailed reporting on the status of Project activities and impacts.

GCF Accredited Entity and Executing Entity

- 169.** Conservation International Foundation (CI), through its CI-GCF Agency, will serve as the Accredited Entity (AE) for the Project. The CI-GCF Agency will be responsible for the overall oversight of this project, including technical, financial, and administrative monitoring and supervision (through reporting, audits, and annual site visits) and review and approval of the Executing Entity's (EE) annual workplans and budgets. CI-GCF will also be responsible for providing support, guidance and backstopping to the EE, monitoring of the achievement of Project results and Outputs, reporting to the GCF, and project closure and evaluation. CI-GCF will conduct these responsibilities, and disburse GCF funds to the EE, in line with CI's Accreditation Master Agreement (AMA) with the GCF. The CI-GCF Agency currently serves as AE for FP26, *Sustainable Landscapes in Madagascar*, a GCF project addressing mitigation, adaptation, and sustainable livelihoods.
- 170.** CI will self-execute this Project; CI Foundation, acting through its country office in Botswana (referred to in this FP as "CI" or "CI Botswana"),²⁰⁴ will be the Executing Entity for all activities of this project. CI Botswana will be responsible for Project execution, management of sub-grantees and their activities, reporting to the AE, and ensuring optimal alignment of Government of Botswana policies and departmental contributions to achieve Project outcomes and Fund-level goals. As EE, CI, acting through its country office in Botswana, will enter into a variety of agreements (including sub-grant agreements, services agreements, and MOUs) for this Project. The CI-GCF Agency has assessed the capacity of CI-Botswana and has determined it to be capable of applying CI and GCF standards and policies in the execution of this Project. Because the CI Botswana office will need to be significantly scaled up for the scope of this Project, time and resources have been included in the workplan and budget of the Project to allow for a realistic Project start-up timeline and sufficient training and capacity-building of new Project staff. Throughout Project implementation, CI-Botswana will be supported by various CI divisions, including CI's Africa Division based in Nairobi and divisions of CI's global support office in Arlington, USA.
- 171.** For more than 30 years, Conservation International (CI) has been protecting nature for the benefit of all. CI employs more than 1,000 people and works with more than 2,000 partners in 30+ countries. Since 1987, CI has supported more than 1,200 protected areas and undertaken interventions across 77 countries, protecting more than 601 million hectares of land, marine and coastal areas. CI's work has also prevented the loss of 115,000 hectares of forest, avoiding 70 Mt CO_{2e} of emissions. CI has been operating in Botswana for over two decades. CI has an extensive network of professional contacts in government, non-government organizations, research and academic institutions and the private sector. Current CI Botswana staff, with the assistance from CI's Africa Field Division and CI HQ, will be responsible for the immediate mobilization and recruitment efforts after project approval and achievement of FAA Effectiveness. By April 2021, CI Botswana will have all operational systems in place for the implementation of an EU-CBT project and AFD Botswana site-projects. Both programmes overlap with the Ngamiland demonstration site for the GCF project, and GCF project implementation will benefit from the EU and AFD project management experience and systems.

²⁰⁴ All references to "CI Botswana" denote the actions undertaken by the project's CI staff employed through CI Botswana, a branch office of Conservation International Foundation registered in Botswana as an external company. The legal entity for this reference is Conservation International Foundation. CI Foundation will be the legal entity entering into any agreements, sub-agreements, or MOUs used in this project.

- 172.** CI Botswana will work closely with Conservation South Africa (CSA), a legally independent subsidiary of Conservation International Foundation with an existing affiliate agreement, where the H4H program was developed. CSA has developed 3 demonstration sites in South Africa where the Herding for Health, Ecoranger, and rangeland stewardship agreement models have been implemented and tested with significant success. CSA staff will contribute expertise to 11 of the Project activities across all three project components. Due to the significant amount of oversight and support provided by CI to its affiliates, the financial activities of CI affiliates (including CSA) are consolidated with CI's financial activities. CI Botswana (the EE) will retain decision making authority and provide prior approval for any CSA interventions during implementation. CSA has worked with multiple donors, partners and stakeholders and has focused on livestock farming communities living on land under communal land tenure within biodiversity hotspots under severe threat from climate change. This work has helped 9 municipalities develop ecosystem-based adaptation strategies for climate change and 832 communal livestock farms have committed to land stewardship, actively restoring over 400,000 hectares of land and created over 750 green jobs. In partnership with Meat Naturally, CSA has helped channel over R10.8M to communal farmers through improved market access as part of the incentive package for rangeland stewardship compliance. In addition, this work has supported 40+ NGOs, government departments and their staff with training in the use of stewardship agreements which ultimately led to stewardship agreements being adopted nationally as a strategy to achieve land stewardship and biodiversity objectives. In addition to this GCF Project, H4H is targeting 3Mha of rangelands over the next 3-6 years across sub-Saharan Africa and will leverage this GCF project to achieve further scale.
- 173.** CI-Botswana will establish the main Project Management Unit (PMU) in the CI- Botswana Gaborone office. The PMU will consist of CI staff and will be headed by a full-time Chief of Party for the Project, who will be responsible for Project delivery and coordination with all stakeholders. The PMU will be responsible for overall project management and planning, providing support to the execution of day-to-day activities, coordinating with the national government and Project partners, coordination with the AE, managing and overseeing grants to BUAN and Rare, and coordinating project execution across four project offices. The PMU will also include the following CI staff: Deputy Chief of Party, Operations Director/Senior Administrator, Finance Manager, and Grants and Contracts Manager. Additional Project staff as detailed in Annex 4 will be based in Gaborone.
- 174.** In addition, CI-Botswana will establish a District Office in each of the Project's target districts (Ngamiland, Kgalagadi, and Bobirwa). Each District Office will consist of CI staff and be headed by an Area Manager and supported by a Finance & Procurement Coordinator and Grants & Contract Coordinator. The Area Manager will ensure effective communication and coordination with local stakeholders and governments, and the other District Offices in implementation of the project activities, and the supporting staff will support implementation of Rangeland Stewardship Agreements and in-kind grants. Additional Project staff (approximately 75% of total staff) as detailed in Annex 2 Feasibility Assessment Section 4 will also be based in the District Offices.
- 175.** The Project staffing plan includes twenty secondments that aim to embed critical skills and leadership capacity into the Government of Botswana by proactively filling critical roles within government to address barriers to climate adaptation. Two of these secondments will be for key positions at MoA at the national level - a Commodity-based Trade Director

within the Department of Veterinary Services, and an *Ipelegeng* Rangeland Stewardship Director. Six secondment positions (two per Project Area) are based at the local level to deliver veterinary support, with planned uptake of Phase II secondees into government positions to ensure that the skills acquired serve to capacitate DVS. Six additional MoA secondments will work with *Ipelegeng* restoration workers and Ecorangers and build management capacity within MoA to oversee skilled *Ipelegeng* workers in the future. Finally, six secondments (two per Project Area) are for the under-resourced Department of Forestry and Range Resources (DFRR). Through incubation in the Project, all seconded individuals will have the opportunity to become new local leaders that support the GoB with critical information for climate change policy and response programmes and extend the impact of the Project well beyond its implementation period.

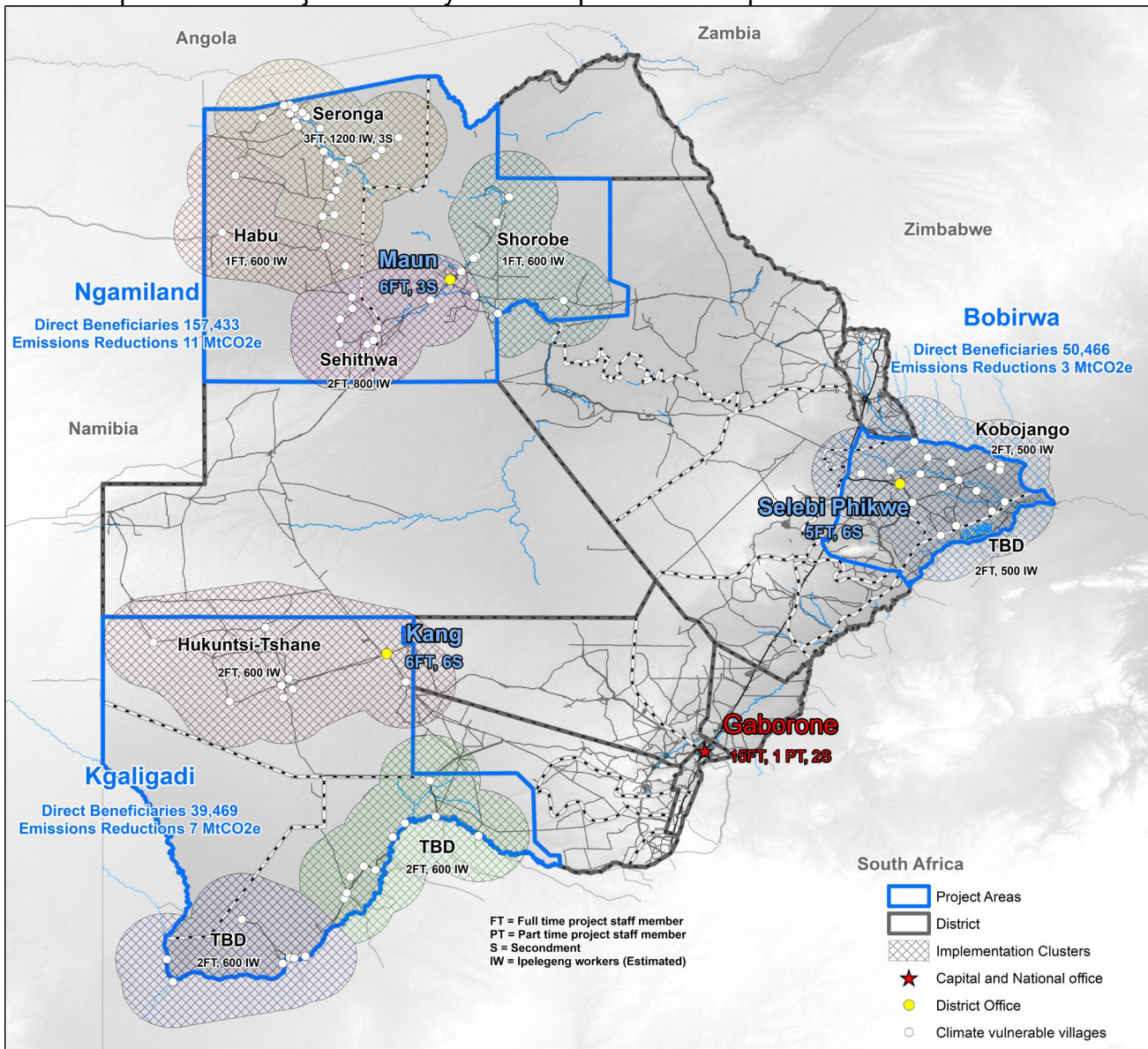


Figure 21: Distribution of Project offices, Project staff, and estimated allocations of Ipelegeng workers over the full course of Project implementation.

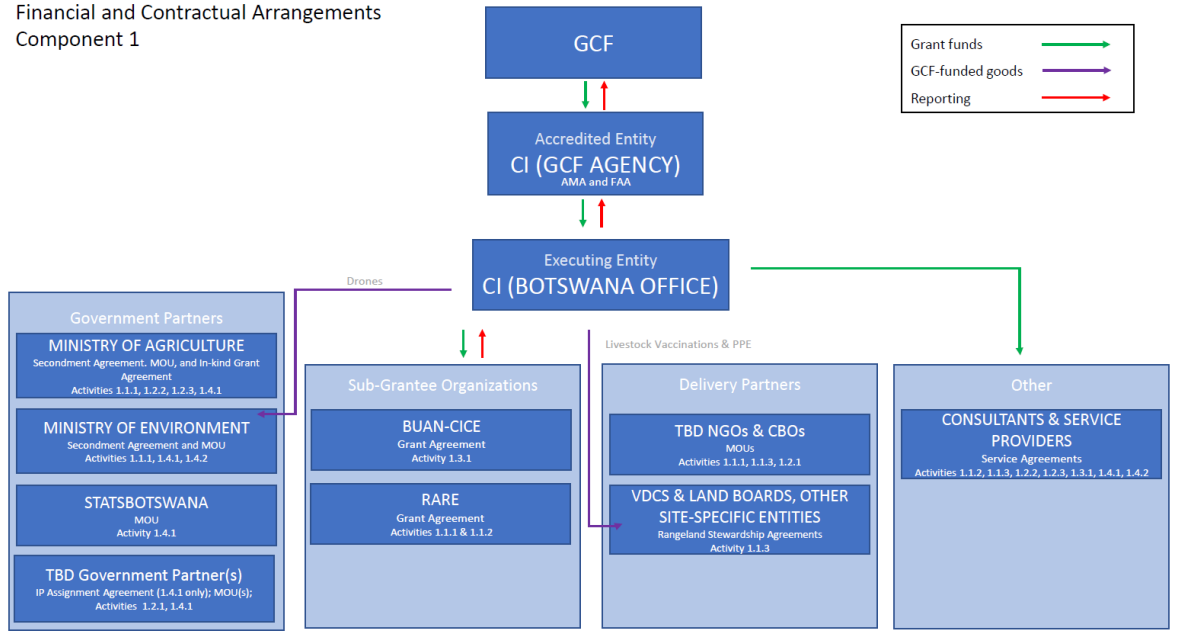
Subgrantee Organizations

176. CI will provide GCF funding to two sub-grantee organizations, BUAN-CICE and Rare, to

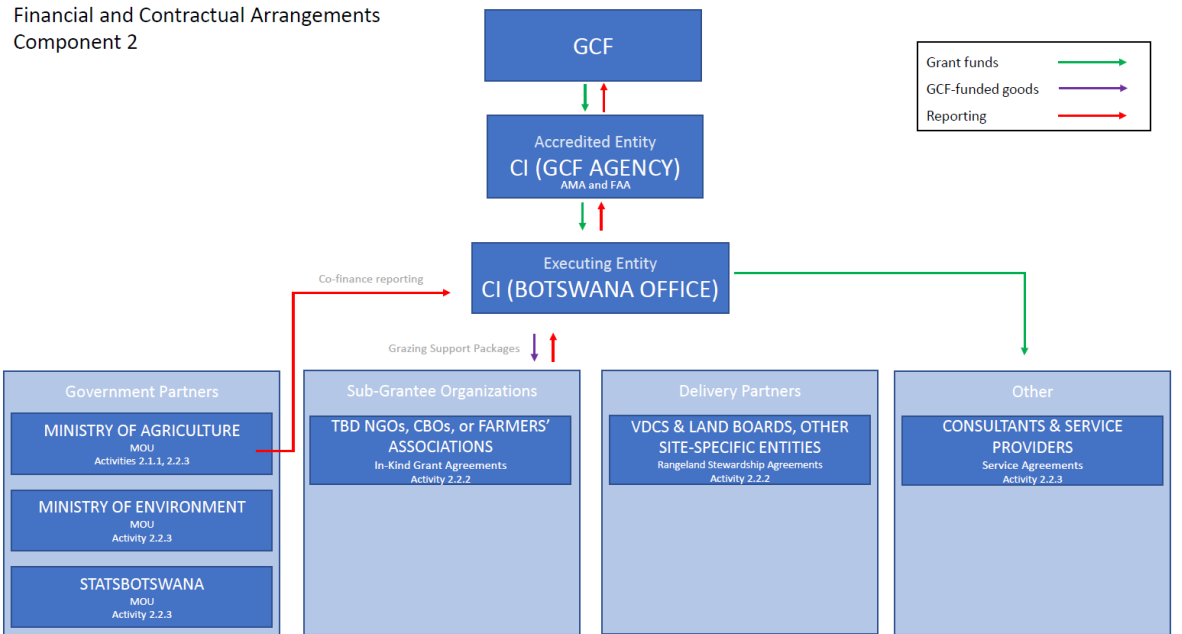
implement certain project activities or sub-activities (see activity descriptions for 1.3.1 for BUAN-CICE and 1.1.1, 1.1.2, and 3.2.1 for Rare). CI will enter into a grant agreement with each of the sub-grantees. CI Botswana will manage and monitor these subgrants, and will approve grantees' annual workplans and budgets.

- 177.** Both grantees have a strong track record as training organisations with extensive and relevant experience. BUAN-CICE has been providing quality in-service and continuing education in agriculture and natural resources since its establishment in 1995. BUAN-CICE designs, develops and delivers training in Botswana Qualifications Authority (BQA) accredited courses, with an offering of more than 50 course curriculums. It draws on experts from the university, government, and private sector to regularly deliver courses to the public and as part of MoA, Ministry of Environment and Tourism and other programmes. Due to its emphasis on practical and in-service training, it is used extensively by MoA for livestock and other agricultural training. Rare has implemented capacity building in 450 community-led projects in over 60 countries that address global conservation threats such as overfishing, deforestation, contaminated fresh water and unsustainable agricultural practices. For over two decades, Rare and Conservation International have collaborated globally on a number of initiatives, including those funded by major global donors such as CEPF, GEF, USAID, and IKI.
- 178.** CI will provide Grazing Support Packages via in-kind grants to organizations (e.g., NGOs, CBOS, and farmers' associations) leading the implementation of the Rangeland Stewardship Agreements (see activity 2.2.2). CI will enter into an in-kind grant agreement (which will include CI and GCF terms and conditions) with each organization, which will be site-specific for each project site. CI Botswana will apply risk mitigation measures and manage and monitor these in-kind sub-grants to ensure that goods are used in a manner consistent with CI and GCF policies, including safeguards and prohibited practices.

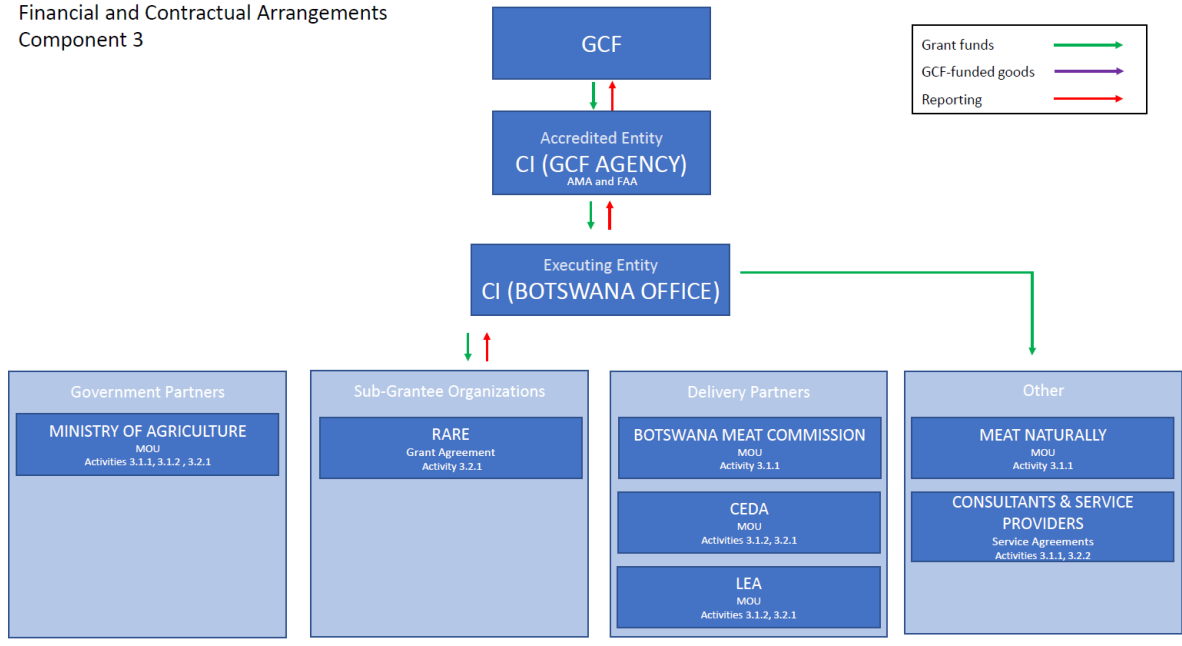
**Financial and Contractual Arrangements
Component 1**



**Financial and Contractual Arrangements
Component 2**



Financial and Contractual Arrangements
Component 3



Note: Arrows pointing to/from a light-blue column apply to all entities in the column. Arrows pointing only sideways to a dark-blue box apply only to that box.

Figure 22. Project implementation and institutional arrangements by component

Government Partners and Governance Structures:

179. The primary government ministry partner (Owner) for this Project will be the Ministry of Agricultural Development and Food Security (MoA). CI will enter into an MoU with the MoA for this project. The MoA will chair the Project Steering Committee (PSC) and convene sub-committees for Planning and Adaptive Management, Implementation, and Enterprise Development and Commodity-based Trade (CBT) Value Chains. CI-Botswana will also sit on the PSC and sub-committees. CI and the Government seek to make the governance arrangements as inclusive as possible to seek inputs from a variety of government departments, ministries, as well as academia, traditional authorities, NGOs, unions, private sector actors, and farmers associations. The proposed structure will allow for open dialogue and buy-in from across government and stakeholders, as well as facilitate the distribution of ideas, successful interventions, and lessons learned throughout Project implementation. CI will ensure representation of large export abattoirs, small private abattoirs, and Meat Naturally's farmer-owned abattoirs that are focused on domestic consumption in these structures. The PSC and sub committees are shown in Figure 22. Current committees of the National Strategy Office, RECC, Rural Development Council (RDC) Multi-Sectoral Committee on Food Security, and National Climate Change Committee will be informed of the Project activities via the PSC. CI will also enter into MOUs with other Government Partners contributing to project Activities as outlined in Figure 22. However, there will be no transfer of funds between these government partners and CI.

Ministry of Agriculture and Food Security (Project Owner and Chair—Project Steering Committee)		
Planning and Adaptive Management Sub-Committee (Components 1 & 2)	Implementation Sub-Committee (Component 2)	Enterprise Development and Value Chain Sub-Committee (Component 3)
<p>**Agriculture and Food Security (MoA-Technical Services) **Environment, Natural Resources and Tourism (MENT-DFRR)</p> <p>*Dept of Gender Affairs *Lands, Water and Sanitation (MLWS) *Local Government and Rural Development (MLGR) *Academia and Research Institutions</p>	<p>**Agriculture and Food Security (MoA-District Agric Coordinators & Veterinary Services) **Local Government and Rural Development (MLGR)</p> <p>*District Land Use Planning Unit (DLUPU) *Land Board *Traditional authorities *Botswana Farmers Union *Farmers Associations, NGOs, CBOs</p>	<p>**Agriculture and Food Security (MoA-Support Services) **Investment, Trade, and Industry (MITI)</p> <p>*Environment, Natural Resources and Tourism (MENT-Tourism) *Local Enterprise Authority (LEA) *Citizen Enterprise Development Agency (CEDA) *Private Sector</p>

Figure 23: Project Steering Committee Structures

- 180.** Steering Committee Meetings will be held on a quarterly basis for effective coordination of Project implementation. The principal functions of the Steering Committee will be to provide strategic guidance and support adaptive management of Project implementation, review progress and evaluation reports; discuss problems or strategic issues that might arise during implementation, and provide support for the necessary inter-institutional coordination and contributions to Project activities. The Project’s annual reports will be shared with all steering committees and will be made freely available to other government departments.
- 181.** In addition to national governance, the District Development Committee (DDC) structures and procedures for alignment and coordination within a district will be utilized for Project reporting and channelling support requests. This local level coordination is in line with Botswana’s decentralization strategy and allows for decision-making that is more likely to find practical solutions to challenges that arise. Quarterly Project reports will be submitted by the VDCs to the DDC as well as via the District Agriculture Coordinator who will receive quarterly reports from the Project team. By embedding the Project into existing structures, accountability for the Project approach and outcomes will be established and as such, will be sustained after the Project ends.

District-level Implementation Arrangements

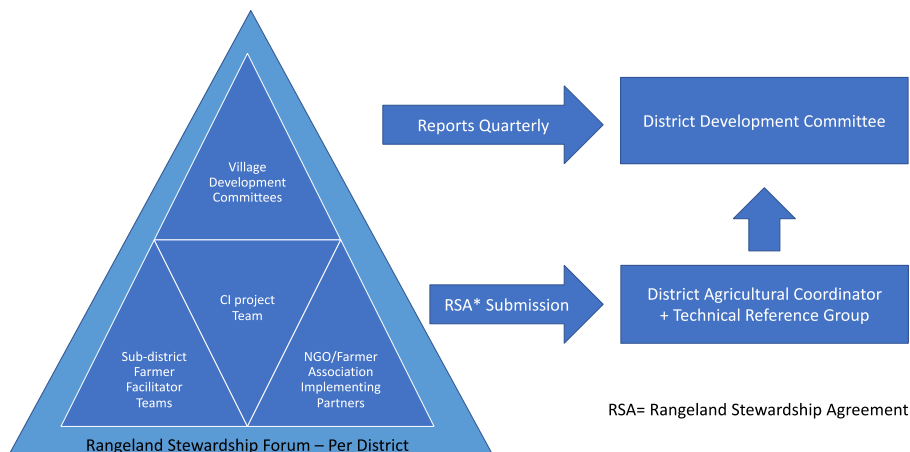


Figure 24: Local level implementation structures and reporting to relevant authorities.

182. The Project will be implemented through village governance structures within the Project areas. Village Development Committees and Land Boards will be mandatory parties to any negotiated Rangelands Stewardship Agreement with CI which, through their endorsement, will become the final local Project plan for the area. Where existing Farmers Associations, CBOs or NGOs are active, CI will enter into an in-kind grant agreement with one of these organizations to provide in-kind goods (procured and monitored by CI-Botswana through in-kind grants²⁰⁵) specified in the negotiated Rangeland Stewardship Agreement to enable the site-specific Project plan. Figures 18a & 18b provide depictions of Rangeland Stewardship Agreement implementation arrangements.

183. An indicative Project organogram is presented below in Figure 25 with links to government partners and secondments. The terms of the secondments between CI and the government partners will be outlined in secondment agreements between the two entities.

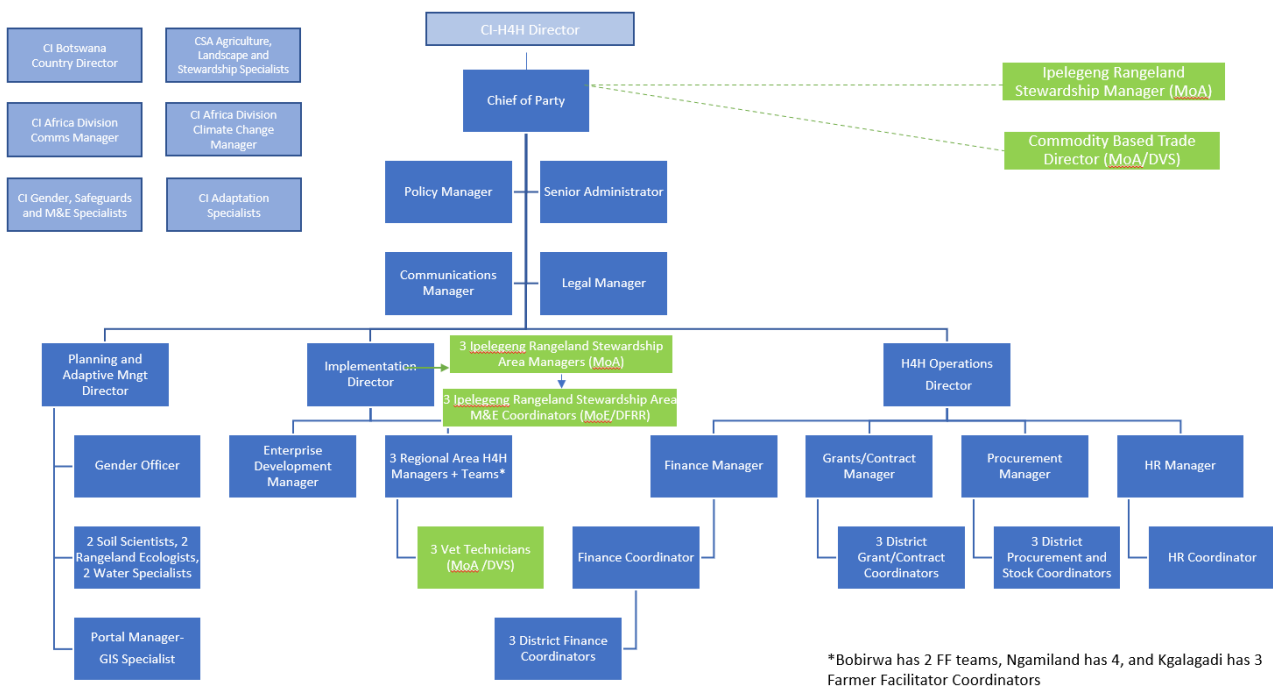


Figure 25: Indicative Project Organogram. All positions in dark blue are newly hired full time CI-staff, in light blue are CI staff allocating a portion of their time to the Project, and in green are seconded positions of key departments in the MoA and MoE. Some positions are active only in certain phases of the project.

Beneficiary Calculations and Selection Criteria at the Village Level

184. Interventions for Project beneficiaries at the village level will be selected based on the livelihood interests of the individual / household – whether livestock farming or interest in one of the alternative-livelihood rangeland product value-chain opportunities. Anyone living in the most-vulnerable communities who is interested and contributing to the Project goals

²⁰⁵ No cash transfers of GCF funds will be made to local-level implementing partners. This will ease administration burden and reduce financial and other risk but still enable participation of smaller NGOs and CBOs as implementing partners in the Project.

will be supported to participate in awareness and training engagements. In order to calculate the potential for beneficiation from the Project, in the absence of recent data on communal farming households, the MoA Agricultural Coordinator for each district was asked what percentage of the total population in the area owned some livestock that were likely to utilize communal grazing lands. This percentage was then applied to each district population data to calculate 80% of the “total communal farming population direct beneficiaries” (176,000). Through local value-add and rangeland-associated economic activities, an additional 71,000 beneficiaries are expected, equalling 247,000 beneficiaries in total or 80% of the Project areas’ population. Eighty percent of the population was identified as a realistic target based on CI’s experience in South Africa where social or value-chain barriers exist that prevent uptake of the project and are outside of Project control. Collaborations with the Ministry of Gender Affairs and Local Enterprise Agency (as per the GAP strategy described in Annex 8) are key in the implementation arrangements to ensure women are aware and able to participate in the Project economic development opportunities. As such, although female farmer beneficiaries are estimated to be lower as a result of current socio-economic conditions in the regions, the Project will have increased targets for women in the rangeland stewardship employment and value-chain activities. Female beneficiaries are estimated to be 125,500 or 51%, nearly equal to the current ratio in the population of the Project areas.²⁰⁶

- 185.** For employment and accredited training opportunities related to Output 2.2, a more formal selection process will be designed as part of a Ministry of Agriculture *Ipelegeng* Rangeland Stewardship Programme (as part of Activity 1.2.2) and deployed via this programme (as part of Activity 2.1.1). The selection will be facilitated by the Village Development Committees as per nationally-legislated protocols for *Ipelegeng* that include low income-level and ‘needs of the household’ requirements, and submit for CI approval and GoB administration. A rigorous and farmer-driven process will be integrated into the Ecoranger job selection process to increase accountability and expand trust in individuals selected (Table 16.)

Table 16: Example of Beneficiary Selection Process for *Ipelegeng* Employment Opportunities

Employment Beneficiary Selection	
1)	Through the RSA development process, determine the total desired positions (# of Ecorangers, # of Restoration Workers, # of Graduate monitors) for a village based on herd size, state and type of degradation, level of farmer self-organisation and capacity, and the potential 3-year grazing plan.
2)	Confirm that the number of selected employees is reasonable based on the overall available budget/employment quota for the area that has been approved by National <i>Ipelegeng</i> Programme.
3)	In a community meeting, CI staff provide detail on government requirements for the role (% women, % youth, % indigenous people, representing most vulnerable households, only one beneficiary per household, etc) and the Job Descriptions (see examples Ecorangers and Team leaders in Appendix 4.10). CI will also provide details on the recruitment process which will include practical test of key skills and attitudes. The community is then left to develop the “short-list” for interviewing.
4)	Mentor farmers and the project team design and undertake an interview process which includes 4-8 exercises that are practical in nature and set up in stations so that the applicant goes through the various exercises over the interview period - fixing a fence, handling an animal (usually a small stock or a dog to test for natural approach to animals), entering data into a phone, etc. Reluctant farmers or champion farmers who are respected by others in the community are often invited to oversee a test within the interview or the overall process.
5)	CI Project staff then identify their selected list and at least three alternates and present these back to the community leadership structure (VDC) for confirmation.

²⁰⁶ See Annex 2 Feasibility Study, Section 4, Para 5.1.1 for more details.

- 6) **Formal medical checks are then completed and if they pass, they are appointed for the 3-year period. Should someone drop out of the programme, alternates have first option to apply. Once alternates are used, a full open process is used to select new positions and additional alternates.**

CI will have the final decision-making, either via a prior approval or non-objection, to the selection of (i) the beneficiary communities, TA beneficiaries, and individuals to be employed under the job creation programme, (ii) the restoration/communal grazing plan, which will contain the specific eligible interventions to be implemented in each community, and (iii) the NGO/CBO/FAs that will support the implementation of such interventions.

B.5. Justification for GCF funding request

- 186.** Despite significant co-finance commitments, the Project requires GCF grant investment to catalyse action and address the complexity, urgency, and scale of investment required. While government, donor, and private sector funding must be secured and aligned to support the proposed programme, only the GCF is able to establish and embed critical climate-resilient approaches and multi-stakeholder coordination across communal rangelands and livestock production efforts to achieve transformational impact at scale. The government of Botswana is committing ~55% of the Project's US\$97.6 million budget and numerous departments and donor projects have the potential to contribute additional resources over the implementation period. The Project grant finance requested will ensure these resources are coordinated and driven by awareness and proven mechanisms to promote climate resilience and ecosystem-based adaptation. The high levels of poverty among Project beneficiaries necessitate the use of GCF grant funds rather than a reimbursable financial mechanism. While statistics on average income for Project beneficiaries are not available (disaggregated by District / economic sector), average income in rural areas of Botswana in 2015 was approximately \$110/month/household²⁰⁷).
- 187.** The implications of climate change impacts for Botswana, where the government is already dealing with climate adaptation challenges, demands concerted action and support both locally and internationally to enable the mainstreaming of climate resilience into public, private and community sectors at the pace and scale required. Given the likelihood of continued increase in anthropogenic emissions and associated global warming, Botswana, as a highly exposed country, in its culturally critical livestock sector in particular, needs to urgently promote and adopt transformative measures to respond to quite rapid changes in local weather and climate characteristics. Although the country is investing in new approaches, the urgency and scale of effort required to increase resilience for its most

²⁰⁷ Statsbotswana, Statistical yearbook 2017 - https://www.statsbots.org.bw/sites/default/files/publications/Statistical%20Year%20Book%202017_0.pdf

vulnerable citizens will not be met solely with national resources in an appropriate timeframe. Specific investments in awareness and governance, new curriculum development and training at scale, and alignment and coordination of support on building climate resilient livestock value chains for communal livestock production are activities not currently being developed by the government of Botswana. The GCF grant investment can help develop and expedite these critical interventions and assist with alignment of future climate resilience policies and programmes.

- 188.** The private sector seeks to engage and support climate resilient livestock production but does not have the resources to instigate transformational change. The private sector is unable to undertake community engagement governance, nor can they train herders at scale to abate degradation on communal rangelands and allow livestock from these lands to be available for the market. The successful implementation of this GCF Project will create new livestock supply opportunities for existing export abattoirs in the Project areas, all of which are operating at significantly less than their operational capacity²⁰⁸. CI will also encourage new entrants into the red-meat value chains in the targeted communities by working with the largest national investor, CEDA, to create sustainable finance options and criteria to increase opportunities for new SME actors in climate-resilient and low-emission meat availability for domestic consumption in Botswana.
- 189.** Finally, the IPCC is encouraging more rigorous monitoring of AFOLU emissions and Tier 2 Livestock-based calculations. This Project will enable the GCF, other donors, stakeholders, and governments to better understand the impact of management interventions in livestock-heavy countries on emissions and adaptive capacity. The Project will also create tools and lessons for large-scale livestock economy interventions, particularly regarding production protocols that require consideration of water, energy, and waste efficiencies and financing structures that encourage adoption of climate resilient actions across the value chain.

B.6. Exit strategy and sustainability

- 190.** Livestock market access incentives and resulting improvements to farmer incomes and contributions to local level support funds are the primary tools to promote ongoing maintenance of rangeland restoration activities and Ecoranger salaries after the initial donor investment. In Phases 1 and 2, CI will ensure that Meat Naturally Botswana and one other abattoir (BMC, Ngamiland, or Batawana) have completed purchasing arrangements with RSA-compliant farmers for income generation as per the diagram in Figure 18b. CI will ensure that the farmer commitments of the RSA are included in the purchase agreements between farmers and buyer, that farmer incentives for communal management are maintained, and that contributions to RSA-compliance activities are made from income generated by the farmers. To secure purchase agreements in Phase 1 and 2, the Project will engage with Meat Naturally Botswana and local authority abattoirs and grow to export operators at Tshabong and Francistown (BMC & Tati) by Phase 3. Meat Naturally Botswana's business plan and financial model shows that as a moderate throughput facility within each landscape, it will break even in year 3 and achieve a low but positive EBITDA margin of 3.7% by year 5²⁰⁹. During the start-up phase, Meat Naturally Botswana will be supported by Meat Naturally Africa, but ultimately will be a financially viable structure

²⁰⁸ Director of Department of Veterinary Services, 21 Jan 2021. DVS monitors carcass numbers from all registered abattoirs in the country.
²⁰⁹ Annex 2, Appendix 5.2, Meat Naturally Botswana Business Plan.

representing communal farmers in the Project with additional Botswanan Directors and business arrangements that can take the business forward into Phase 3 and beyond the Project period.²¹⁰

- 191.** Supported by the growing demand for low-emissions meat, a key to Project sustainability will be embedding and enabling traceability of high environmental and social standards that are included in Rangeland Stewardship Agreements. Within the Ngamiland area, there is a demand surplus of 150 tonnes of meat products for the tourism sector in the Okavango Delta due to insufficient local quality.²¹¹ Interviews and market data indicate the tourism sector's willingness to pay for consistent quality of product, particularly when those products are sourced locally and support communal farmers adjacent to tourism concessions²¹².
- 192.** The Rangeland Stewardship Information Portal will provide a consolidated monitoring and evaluation system that will not only confirm impact of the GCF and government investments, but also act as conduit for additional ecosystem service payments that are directly tied to ecosystem and socio-economic health (e.g., biodiversity indicators, carbon sequestration, water indicators, gender equity, and poverty alleviation indicators). These payments are currently being developed in other Herding for Health sites in collaboration with Project strategic partner Meat Naturally. The lessons learned and potential impact investors that are identified will be brought into operationalising sustainability for this Project.
- 193.** The Project impacts and activities will be sustained via expanded capacity of rangeland stewards (herders, farmers, VDCs, and Land Boards); expanding and embedding economic incentives for climate smart land and livestock management; and sharing lessons via targeted policy engagements to promote additional scaling and replication of Project activities. Individual household benefits from income generation opportunities from markets and red meat value chains are clearly viable and improved market conditions enable a range of new opportunities to be developed. As shown in the financial analysis (Feasibility Assessment Section 2), all the proposed EbA measures are financially attractive with a positive NPV value that will incentivize long-term implementation if the GCF and government co-finance covers the short-term capital needs to overcome initial hurdles of human and operational resource provision to enable collective herd management. Returns across short, middle, and long term are higher for the Project relative to the current scenario and certainly much higher than BAU practices in the face of climate change.
- 194.** Awareness raising as a component of broader community engagement and empowerment is a critical component of the Project, as understanding and ownership underpins success beyond the Project lifespan. Through gender-sensitive, consistent and transparent stakeholder engagement (following a Rights-based Approach) the Project will embed community stewardship through Rangeland Stewardship Agreements that are scientifically informed and reflect a sustainable landscape approach. The premise of stewardship agreements is that they are a fair deal, with conservation actions performed in exchange for benefits based on verified performance.
- 195.** The Rangeland Stewardship Agreement documents, negotiated actions, and co-designed benefits have proven to be effective at promoting uptake and real behaviour change. The

²¹⁰ Meat Naturally Botswana directors are in discussion with BMC officials, but the political decision on the privatisation and operational arrangements of BMC need to be finalised before a clear supply arrangement can be finalised. Ministry of Agriculture has indicated it will table a proposal to Parliament on this before the end of 2021, COVID permitting.

²¹¹ Annex 2, Appendix 5.6, pg 13

²¹² Annex 2, Appendix 5.2, pg 12-15

provision of specialized training on climate change, environmental management, herding and animal health to support implementation of the agreements, as well as at least 50 trainings per year on a variety of themes such as health and safety, governance development, financial management, grazing planning, water monitoring, and record keeping will be key to sustaining interest in Ecoranging as a career and in sustaining the skills required for implementing the RSA in perpetuity after the end of the Project.

196. Farmers, VDCs, and Land Boards will be guided by the Farmer Facilitation Teams to design their own sustainability strategy from the first discussion and development of the site's Rangeland Stewardship Agreement. For example, in South Africa, farmers agreed in the initial agreement to contribute a percentage of all new sales into a Herder's Fund managed by their association to take over the employment of Ecorangers as a farmers' association contribution once the three-year investment by the government in their training is complete. Meat Naturally Botswana will incentivise higher percentage contributions to Herder Funds from farmers associations by providing more favourable payment terms for RSA-compliant farming groups that agree to increased Herder Fund contributions. Sustainability models will be discussed with all RSA participants in Botswana at the outset of the engagement process so that sustainability considerations come at the beginning and not the end of the project. These discussions will focus on three key incentives that, from CI's experience, motivate sustained implementation of regenerative land and livestock management:

- **Reduced risk and loss:** Reduced risk of loss of animals to drought and predation is often a sufficient incentive, alone, to sustain engagement in the Rangeland Stewardship Agreement. In one study in 3 communities in Ngamiland, 84% of the farmers had lost animals to drought, 8.3% had lost animals to predation and 5.2% had lost animals to disease²¹³. In South Africa, efforts that started with the intention of market development are now sustained by the community and local NGOs even without any government subsidy or new income generation because farmers and the broader community have experienced the improvement in water security, reduced human-wildlife conflict, and the health of their livestock.
- **Access to markets/income from livestock:** Long-standing trade barriers for communal farmers, and the need for the collective grazing systems and record-keeping to access Commodity-based Trade markets, provide incentive for sustaining commitment to RSAs. CI has found that private sector partners can sustain the incentive by tying the prices paid to measurable environmental improvements. As indicated in Figure 18b, Meat Naturally Botswana is one partner that has committed to converting RSAs into "supplier contracts." As part of Component 3, CI will engage with the Botswana Meat Commission and other private sector actors to solicit and encourage similar commitments. CI has engaged the BMC on RSA compliance price premiums and contributed the idea to the national Beef Cluster Strategy, which was adopted by the MoA in July 2020. In addition, CEDA, which will be channeling US\$40 million in post-COVID economic recovery funds into enterprise development, has expressed that RSA compliance could be a requisite for its financing of livestock development. (See Annex 26).
- **Termination of government subsidy:** In South Africa, the government only funds a given village grazing area for 3-6 years. In Botswana, while *Ipelegeng* has not yet imposed a time limit on its support, CI expects one to be introduced. As such, free labour from *Ipelegeng*

employees will not be available indefinitely, and communities wishing to maintain ecosystem resilience and improved market access will be incentivized to continue with RSAs using their own resources. As previously described, this model has proven effective in South Africa.

- 197.** The Project design also includes a standard review of site sustainability at the end of year 3 before a second three-year investment is made. This process enables incremental adoption and contributions of the local communities to the sustainability plan from their changing experience and awareness of both market and climate conditions. Where farmer or livestock numbers or governance capacity are lower, there may be a need for another transition or sustainability plan to be negotiated. For example, a particular site could offer to become an Ecoranger Training Hub in exchange for continuation of Ecoranger salary payments. In some locations due to low herd size or other factors, the continued subsidy of Ecoranger salaries by the government through the *Ipelegeng* programme may be necessary. This will be identified during the 3-year assessment and adaptive management planning sessions.
- 198.** In addition to farmer contributions to a local level funds, tourism and livestock value chain partners will be solicited to provide a portion of their profits/revenues into these funds in recognition of the co-benefits the improved livestock management contributes to wildlife and value-chain resilience under climate stress. Other contextually-appropriate streams of funding will also be developed during implementation including carbon financing, and/or from beef premiums. See Feasibility Study Section 5 Market Assessment and Sustainability Plan for more information.
- 199.** While RSA sustainability plans will include funding for Ecorangers and associated restoration efforts, the Government of Botswana will likely continue to fund and expand the use of its *Ipelegeng* work-program to support the professions developed and piloted by the Project. The annual budget for *Ipelegeng* is ~US\$65 million²¹⁴ by the government and therefore it is expected to remain well-funded over the coming years. The *Ipelegeng* program provides employment to approximately 70% of the Botswana formal workforce (60,000 individuals per month for 3-month rotations) and the government is actively seeking professional development avenues for this programme. The contribution the programme will make as a training allowance per participant will establish a financial model for ongoing implementation of the BUAN-CICE in-service training after the Project. By showing the success of the Ecoranger model that supports livestock development and climate adaptation mitigation goals, the government is likely to continue to fund this mechanism and increase its support over time. The current *Ipelegeng* Director is already recommending Ecorangers in the long-term strategy revision for the programme.
- 200.** During the Project period, CI will expose Botswana to other successful strategies for sustaining rangeland management labor and monitoring support as part of social protection investment programmes. There are at least two models in Africa that are similar to what is being proposed in this initiative for sustainability: the Ethiopian Productive Safety Net Programme (EPSNP) and the South African Natural Resource Management Programme²¹⁵. Both these programmes are primarily agricultural in nature with a focus on restoring pastoral and croplands and they provide good evidence of building household resilience in the long-term. Ethiopia continues to spend US\$900 million per annum on its programme in support

²¹⁴ Annex 6: Environment and Social Management Plan

²¹⁵ <https://www.environment.gov.za/projectsprogrammes>

of 10 million beneficiaries on 60,000 km² at a cost of \$90 per beneficiary. At a national scale, Ethiopia is now using the programme's carbon sequestration benefits to support their NDCs and attract carbon finance for sustainability²¹⁶.

- 201.** South Africa's Natural Resource Management (SANRMP) programmes also provide a similar model of a national job creation for restoration programme. The initiative, which is reviewed in Annex 2 Section 4 Appendix 4.7, shows the investment the government makes annually to their land restoration programme, the return on the investment, and the potential to increase the scale of the programme for further job creation and ecosystem benefits. As a result of collaborations with Conservation International, the Working on Ecosystems Programme NRM component has evolved from short term wage to a longer-term development opportunity, with three-year support for wages and in-service training for Ecorangers. Personal communication with the senior manager for the programme provided an estimate of a per annum investment in Working for Ecosystems of roughly \$8700 per year for three years (\$26,100) per beneficiary (NRM currently employs 100,000 per annum) with an estimated 55% "graduating" from the system into formal ecosystem-based economic activities after the investment. This shows that the contribution to broader unemployment and economic vulnerabilities to climate change are being sustained.
- 202.** The Project design embeds stewardship linkages to long-term market incentives. Working with the private sector, Project staff will leverage supply chain opportunities to maintain and encourage organic continuation and replication of the restoration techniques. At the end of the Project implementation period, Rangeland Stewardship Agreements will convert into supplier contract agreements between farmers associations and private sector buyers to continue their relationship and ensure sustainability of supply and demand in the value chain. Through supplier contract agreements, communities will continue to commit to restoration work and regenerative grazing practices (See Figure 18). CI will also work with private sector partners to encourage the creation of employment opportunities for Farmer Facilitation Team members, particularly during years 8 and 9 of the project. This strategy was proven effective in CI's H4H work in South Africa where former NGO extension officers now have permanent positions running the market access activities of Meat Naturally.
- 203.** The Project strategic partner, Meat Naturally, will also offer shareholding in the business for compliant farmer groups and distribute profit-share if, and only-if, farmer groups continue to show good environmental and livestock management. This Meat Naturally model has proven highly successful in sustaining the engagement after government and NGO funding has stopped at communal farming sites in the former homelands in South Africa where sites whose funding ended in 2016 continue to implement improved grazing management and receive market access benefits (including a \$95,000 auction during the height of the COVID-19 lockdown when farmers needed to convert their livestock assets to cash during the crisis²¹⁷). Meat Naturally has been highly successful in replication and expanding into neighboring communities that never had initial NGO funding but were able to self-organize into an association and improve grazing practices to receive the market and livestock production support benefits. Meat Naturally has assessed and determined there are similar conditions in the FMD red zones of Botswana and has plans to enter these markets in 2021/2022. As such, the partnership with Meat Naturally Botswana is a key part of the Project exit strategy.

²¹⁶ (<https://www.tandfonline.com/doi/full/10.1080/14693062.2018.1427537>).

²¹⁷ https://www.wwf.org.za/our_news/our_blog/cash_cows_in_a_time_of_corona.cfm

- 204.** Partnerships with auditing bodies for sustainable livestock production (e.g., Botswana Farm Assured) and ecosystem indicators (e.g., Climate Community and Biodiversity Standards) or greenhouse gas verification standards, as well as universities and private sector actors, will be developed to ensure optimal internal monitoring, independent auditing, and employing verification systems that utilise data from the Rangeland Stewardship Information Portal. Ultimately, this monitoring system can augment traceability and sustainability, and enhance the value and prices received by farmers for their livestock.
- 205.** The Project will also seek to inform relevant policy platforms in a way that supports long term sustainability. The national institutions that are mandated by the government of Botswana to build resilience to climate change shall be involved in the implementation of this Project and as a result, Project initiatives will be mainstreamed via the PSC into national planning (for example, the Rural Extension Committee and National Strategy Office Planning forums) so that Project lessons learned and achievements live beyond the Project implementation period. Specific transformational goals are repurposing job creation investments (*Ipelegeng* and others), building a more climate-responsive Department of Veterinary Services, expanding compliance and purpose of the Botswana livestock traceability system (BAITS), empowering the Department of Forestry and Range Resources in a more informed and formal advisory role in communal land management decision-making, and ensuring climate-resilience considerations are integrated into both the National Grassfed Beef Strategy and CEDA financing criteria. Farmer Facilitation Teams will strengthen the Ministry of Agriculture’s capacity and forge new partnerships with civil society to reach remote rural areas to impart evolving best practices in a consistent way.
- 206.** The Department of Veterinary Services has committed to uptake positions initially financed by the Project as part of their budgetary requests for increased support to enable Commodity-based Trade. It has also committed to taking over O&M for drones as necessary to maintain the level of support to rangeland stewards post-Project as indicated in its letter provided in Annex 25.
- 207.** All other Operations and Maintenance for equipment will be absorbed by beneficiaries or implementing NGO partners for demonstration village grazing areas as well as any areas that have been compliant with their Rangeland Stewardship Agreement for a three-year period. For areas that require replacement equipment, CI will work with farmers and project partners (CEDA, LIMID, BMC and Meat Naturally) to develop a replacement plan that is not dependent on GCF funds. For farmers that have not met compliance agreements, the equipment will return to the Ministry of Agriculture for re-deployment as replacements or in the further roll-out of the Rangeland Stewardship Programme to other communal areas in the country. See Annex 21 for details.

C. FINANCING INFORMATION

C.1. Total financing

(a) Requested GCF funding (i + ii + iii + iv + v + vi + vii)	Total amount	Currency
	36.8	million USD (\$)

GCF financial instrument		Amount	Tenor	Grace period	Pricing	
(i)	Senior loans	36.8				
(ii)	Subordinated loans					
(iii)	Equity					
(iv)	Guarantees					
(v)	Reimbursable grants					
(vi)	Grants					
(vii)	Result-based payments					
(b) Co-financing information²¹⁸		Total amount		Currency		
		60.8		million USD (\$)		
Name of institution	Financial instrument	Amount	Currency	Tenor & grace	Pricing	Seniority
Government of Botswana	Grant	54.0	million USD (\$)			
Conservation International Foundation (CI)	In kind	6.8	Million USD (\$)			
(c) Total financing (c) = (a)+(b)		Amount		Currency		
		97.6		million USD (\$)		
(d) Other financing arrangements and contributions		NA				

C.2. Financing by component

Please provide an estimate of the total cost per component and output as outlined in section B.3. above and disaggregate by source of financing. More than one co-financing institution can fund a single component or output. Provide the summarised cost estimates in the table below and the detailed budget plan as annex 4.

Component	Output	Indicative cost million USD (\$)	GCF financing		Co-financing		
			Amount million USD (\$)	Financial Instrument	Amount million USD (\$)	Financial Instrument	Name of Institutions
Component 1: Strengthening institutions and support systems for climate responsive-planning and management.	Output 1.1: New structures and systems for climate responsive planning and implementation by communal populations are operationalised	6.1	5.1	Grants	1	In-kind	CI
	Output 1.2: New job creation programme and veterinary approach for climate	4.6	3.8	Grants	0.7		

²¹⁸ The GoB will make budgetary allocations through its existing Ipelegeng program to directly fund the salaries of 6,000 Ecorangers, Restoration Workers, and Graduate Monitors for Activity 2.1.1 of the project. Wages will be paid directly from the GoB to the employee via established Ipelegeng social grant management protocols. The GoB will also pay a training fee per Ecoranger, Restoration Worker, and Graduate Monitor directly to BUAN-CICE to cover in-service training costs. The GoB will also provide the administrative / management costs required for these payments. Please see Annex 4 for details on co-finance. None of the GoB co-financing resources will be transferred to CI. Co-financing, including reporting requirements, will be included in an MoU entered into between CI and the Ministry of Agriculture. The indicative co-financing amounts are subject to the GoB's annual budget review and approval process. However, the political importance of the wages for public works programme and commitment letter to this Project, which recognizes the contribution to several key outcomes of the National Development Plan through this single investment, support the government's commitment.

	responsiveness are adopted by national departments.						
	Output 1.3: New rangeland management curricula developed and operationalised to expand skills for restoration and regenerative grazing	2.6	2.2	Grants	0.4		
	Output 1.4: New rangeland monitoring system is operationalised, embedded, and utilized in market, carbon monitoring, and policy systems	2.5	2.1	Grants	0.4		
	Output 1.5: Improved government policy initiatives on climate change actions and needs, enabling adaptive management	0.7	0.6	Grants	0.1		
Component 2: Reducing GHG emissions and negative livelihood impacts through new job deployment in rangeland rehabilitation, improved livestock management, and climate impact monitoring	Output 2.1: Job creation and social safety net programmes resourced by the Government are used to deploy restoration teams for climate-resilient land and livestock management in target Project Areas	51.9	0.4	Grants	51.4 0.1	Grants In-Kind	Government of Botswana CI
	Output 2.2: Rehabilitation of ecosystems and improved management of land, soil, and livestock implemented to increase ecosystem productivity, reduce vulnerability of beneficiary populations, and reduce GHG emissions on 4.6 million hectares of climate-vulnerable communal rangelands	19.8	16.7	Grants		In-Kind	CI
Component 3: Promoting climate-sensitive enterprise development and value-chain investments to sustain transformational change	Output 3.1: Market readiness trainings, enterprise development support, supply chain facilitation, and local level funds build the enabling conditions for improved low-emission livestock value chains	3.7	3.1	Grants	0.6		

	Output 3.2: Selected financiers and value-chain players are aware and supported to incentivise rangeland stewardship and adopt carbon-optimisation practices and technologies	1.1	0.9	Grants	0.2		
Independent Evaluations		0.1	0.1	Grants	0.02		
Project Management Costs		4.6	1.7	Grants	2.6	Grants	Government of Botswana CI
					0.3	In-Kind	
Indicative total cost (USD)²¹⁹		97.6	36.8		60.8		

C.3 Capacity building and technology development/transfer (max. 250 words, approximately 0.5 page)

C.3.1 Does GCF funding finance capacity building activities? Yes No

C.3.2. Does GCF funding finance technology development/transfer? Yes No

The Project approach is based on building the human resource capacity and technology systems to enable collective action to overcome the Tragedy of the Commons on communal rangelands. This approach involves substantial engagement and long timeframes to deliver sustainable change, especially when sustainability is dependent on behavior change and the success of value chains.²²⁰ CI will build capacity through secondments to key departments within the Ministry of Agriculture and the Ministry of Environment, Nature, and Tourism; the provision of critical resources such as new IT infrastructure, cell phones and drones for monitoring, veterinary refrigerators; and delivering organisational and individual training for skills development that will build long-term adaptive capacity and sustainability of the GCF and GoB investments.

Approximately US\$8.5 million (23%) of total GCF funding will be used for capacity building and technology transfer activities. These include total costs for activities 1.1.1, 1.2.3, 1.3.1, 1.4.2, 3.1.2, and workshop costs for all other activities.

²¹⁹ Columns may not add up to the total amounts due to rounding. Please see Annex 4 Detailed Budget Plan for exact figures.

²²⁰ <https://www.innovationforum.co.uk/articles/why-landscape-solutions-need-engagement-and-time?>

D. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

This section refers to the performance of the Project/programme against the investment criteria as set out in the GCF's [Initial Investment Framework](#).

D.1. Impact potential (max. 500 words, approximately 1 page)

- 208.** The proposed Project will contribute to both mitigation and adaption impacts presented in the GCF Investment Framework. Specifically, it will contribute to:
- M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks
 - A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions
 - A4.0 Improved resilience of ecosystems and ecosystem services
- 209.** GCF Fund-level impacts will be achieved through the deployment of Ecorangers and Restoration Workers on 4.6 million ha of high-biodiversity rangelands. Impact will be achieved by employing active vegetation, erosion-prevention, and fire management techniques, combined with livestock grazing practices that improve the broader landscape and its ecosystems through planned rotational rest, and intensive corralling to concentrate manure and break up hard-packed soil surfaces and restore ecosystem function (M9). To enable the development and sustainability of these actions, institutions (A5), adaptive capacity (A7), and awareness (A8) will be strengthened across all stakeholder groups (community, farmers, herders, government, and private sector).
- 210. Mitigation Potential:** The Project activities will lead to a 30-46% reduction of annual GHG emissions from the livestock sector in the Project areas from a baseline value of 656,173 tCO_{2e}/year. The project will also achieve considerable emissions reductions through the enhanced ability of rangelands to sequester carbon. Considering the projected rate of uptake of improved livestock practices and rangeland management (80%), total emission reductions during the life of the Project are projected to be 4.7M tCO_{2e}, and 21.5M tCO_{2e} by year 20 as a result of restoration of target rangelands and reduced emissions from the target areas' livestock. This is equivalent to ~47% of Botswana's NDC target of 15% reduction in national emissions²²¹. Currently, Botswana does not include the reduction of livestock emissions in their NDC commitment strategy. However, this Project can help officials understand and develop future low emission development strategies that include this source of emissions, as well as nationally appropriate mitigation actions given the large proportion of the country's population involved in livestock farming.
- 211. Adaptation Potential:** The Project will decrease loss of economic assets, diversify livelihoods, and improve income generation opportunities thereby directly increasing the adaptive capacity of 247,000 individuals in Botswana's most vulnerable farming economies. These direct beneficiaries represent ~80% of the population in the target regions and 10% of the national population. Most of the targeted households fall below the national poverty line and the global poverty line of <\$1.90 per day. Given the

²²¹ In addition to livestock emissions reduction, total mitigation potential is calculated based on land rehabilitation and avoided degradation of 4.6 million ha, at an estimated .2 t/ha based on soil type in the target area. See Annex 2 Section 3 Carbon and Water Baseline and appendices for details of the calculation.

dependence of local economies on livestock and tourism-related income, as well as improved facilitation of national mitigation and adaptation policies the project will deliver indirect resilience benefits to the national population of 2.3 million individuals.

212. The estimated 6,000 individuals who receive professional development as Ecorangers, Restoration Workers, and Graduate Monitors will have permanently improved adaptive capacity as a result of these newly acquired skills that are in high demand. Improved management of 4.6 million hectares and unlocking of markets will build livelihood resilience through enhanced provision of fodder and income generation. Through improvements to the rural economy and ecosystem services, especially during extreme climate events, an additional % of the population within the target areas are also likely to benefit from enhanced economic resilience of the farming community to drought.

213. The project will impact the amount of bare ground, areas covered in bush encroachment and invasive alien plants, and increase water infiltration, decrease human-wildlife conflicts relative to baselines collected for each village grazing area at the initiation of project activities at that site. The healthier ecosystems will be the basis of EbA model for Botswana and the broader region.

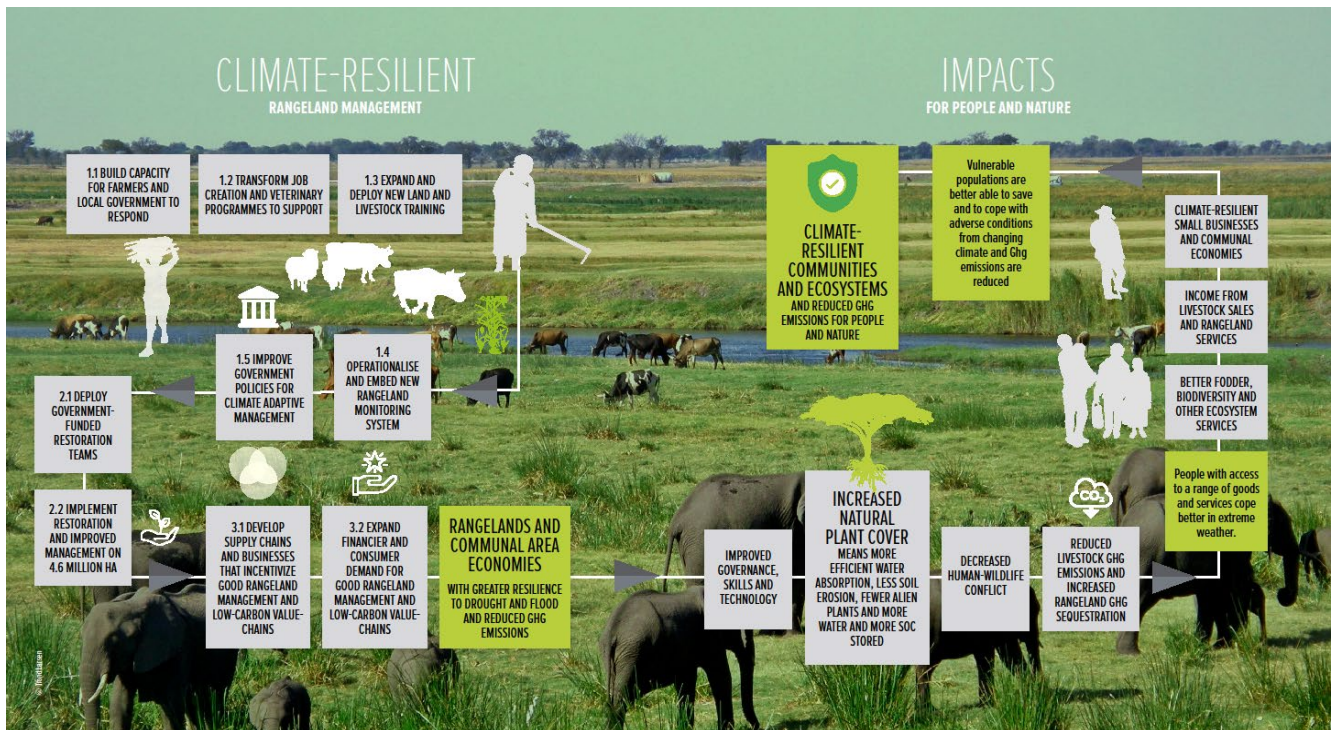


Figure 26: Project impacts and co-benefits

D.2. Paradigm shift potential

Potential for scaling up and replication

- 214.** Africa contains 25% of all global rangelands, or 1.3 billion ha²²². These unique ecosystems support some of the last populations of mega-herbivores and predators. They also support more than 200 million pastoralists that are often in competition with wildlife²²³. In Southern Africa, rangeland habitats cover over 90% of the region, supporting key agriculture and tourism activities that contribute to GDP and critical ecosystem services such as water, habitats for biodiversity, and these critical ecosystems maintain livelihoods and cultural traditions. Healthy rangeland systems in Southern Africa can sequester 10m³ CO₂ per hectare per annum, a carbon sequestration potential which may equal that of the Amazon rainforest²²⁴. Southern Africa's rangelands are also increasingly under threat from land degradation, including an 8% increase in woody plant encroachment (including invasive alien plants) over the last 30 years²²⁵ and increasing extents of bare ground, and as in Botswana, climate change is likely to further exacerbate the degradation of rangelands²²⁶. Projected climate impacts include a "CO₂ fertilization effect", higher temperatures, larger rainfall events, and reductions to herbivore populations due to reduced ecosystem carrying capacity²²⁷. Climate models also project drier, hotter conditions with increased length of dry seasons and increased drought frequency or severity²²⁸. All of these impacts will lead to a decrease in grazing capacity, reduced food security for vulnerable populations, and increase the need for transformative solutions across the region.
- 215.** An analysis conducted on the applicability of the Herding for Health model across Eastern and Southern Africa shows an estimated 355 million hectares across 17 countries that would benefit from restoration engagements on communal lands and that this could generate an emissions reduction benefit of 210Mt-2,732Mt per annum.²²⁹

²²² FAO, 2001

²²³ African Union (2010)

²²⁴ Brandt et al, 2018

²²⁵ Venter et al., 2017

²²⁶ Venter, Cramer, Hawkins, 2018, unpublished data.

²²⁷ Venter et al., 2017

²²⁸ Niang et al (2014) IPCC Fifth Assessment Report

²²⁹ DeWet, R et al in prep. (2020)

“Eligible” Distribution

Areas where the Dasymetric cattle density is greater than the Areal-Weighted density.

i.e. The areas where livestock production is most likely to occur based on factors such as vegetation and climate (as modelled by FAO).

This also excludes all protected and urban areas.

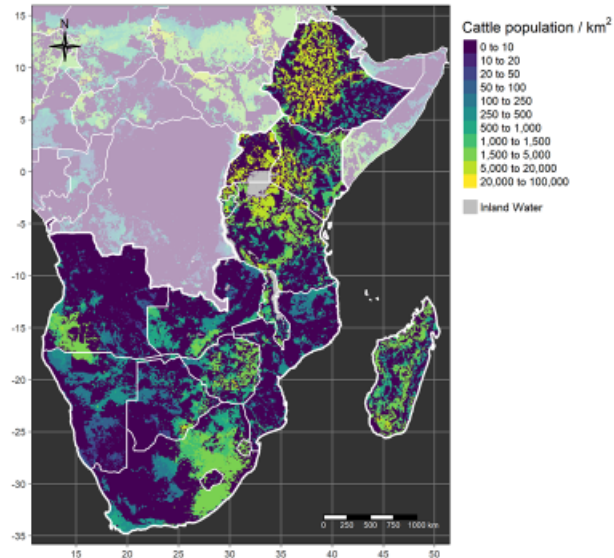


Figure 27. Map of areas across Africa where the Herding for Health model and lessons from this GCF Botswana project could be replicated.

- 216.** Within Botswana, implementation of the Project model will be most relevant for the Chobe area, and in the Kwaneng and Ghanzi Districts. Herders and communal farmers in these areas are extremely vulnerable to climatic change both as a result of increased risks associated with their work through direct exposure and associated impacts as well as low adaptive capacity resulting from few investments in their well-being. Examples from elsewhere in the world have shown how investing in formal recognition and stewardship programmes that value the traditional knowledge they have can be transformational for the individual and the community.²³⁰
- 217.** Over the last seven years, Conservation International and its partners have been able to integrate restoration activities into an effective H4H model that simultaneously improves livestock management and the livelihoods of poor rural farmers. Through scientifically informed restoration best practices and the development of innovative market access strategies the model demonstrates the significant potential to sustain catalytic investments in restoring Southern Africa’s degraded rangelands. Through this Project, the government of Botswana and Conservation International will deliver the H4H model at a national scale to quantifiably demonstrate how these changes contribute to livestock-based emissions, increase sustainable rangeland carbon storage, and contribute to critical indicators of climate resilience via the development of a new resilient rangeland economy.
- 218.** The H4H model is currently being implemented at various scales in Southern and Eastern Africa: in Mozambique (Limpopo National Park, Maputo Special Reserve), South Africa (three landscapes), Zambia (Simalaha Conservancy) and Kenya (three

²³⁰ Jones, Roxanne et al. “Associations between Participation in a Ranger Program and Health and Wellbeing Outcomes among Aboriginal and Torres Strait Islander People in Central Australia: A Proof of Concept Study.” *International journal of environmental research and public health* vol. 15,7 1478. 12 Jul. 2018, doi:10.3390/ijerph15071478; and further case studies in Maddox, Gregory & Chatty, Dawn & Colchester, Marcus. (2003). *Conservation and Mobile Indigenous Peoples: Displacement, Forced Settlement, and Sustainable Development*. *The International Journal of African Historical Studies*. 36. 690. 10.2307/3559459.

sites). Preparation for two sites in Zimbabwe, one in Lesotho, and one in Namibia are also underway. In total, the H4H Programme currently works on more than three million hectares outside of Botswana. A site typically hosts 5,000 – 50,000 head of livestock. Through interactions between this Project and those sites and the development of a common H4H online tool-box, CI's regular engagement with funders, the organic growth of CI-founded Meat Naturally business into Africa, and promotion of the project approach via the GDSA and other policy platforms, the Project can be replicated with little to no additional external funding.

- 219.** Through the successful implementation of this Project, it is hoped that these pilots will expand to the national scale and eventually reach all SADC countries, and include the participation in this or similar programs of nine million people living adjacent to transfrontier conservation areas in these countries to dramatically increase their resilience to the impacts of climate change. The model's anticipated biodiversity conservation co-benefits will provide crucial support to wildlife conservation efforts that can protect current tourism-based contributions to national economic well-being and provide a core pillar for sustainable development. As such, the GCF investment in this project can be catalytic in replicating this paradigm shift across Africa (see Figure 27).

Potential for Knowledge Sharing and Learning

- 220.** Conservation International is part of several important platforms including the Evergreening Alliance, AFR100, GDSA, and the Africa Biodiversity Group that are looking for implementation models like those in this proposed Project. Conservation International also operates in more than 30 countries globally and conducts regular learning exchanges that will facilitate the distribution of the lessons learned and successes of this Project with stakeholders all over the world.
- 221.** The Project will become a flagship for implementation of the Herding for Health model at scale. Project lessons on scaling to the national level will be shared with other H4H programs in Southern Africa, contributing to the development of those programs. Herding for Health is also regularly profiled within SADC CCARDESA events and will play a significant role in the UN Decade of Land Restoration²³¹. Through participation in these platforms, the development of communications tools, and through its Africa Division, CI will share the Project approach, tools, and lessons learned to build regional understanding, knowledge, and capacity for replication of Project models and climate resilient livestock production policies with NGOs, multilateral development banks, UN agencies, and a variety of partners in other African nations.
- 222.** The extraordinary level of government buy-in and active participation in the Project will also contribute to sharing knowledge and experiences from this Project. A variety of ministries and departments of the government of Botswana will be engaged in this Project or informed regularly about its progress. These divisions of the government will share lessons learned with other national governments through a variety of engagements and be able to support the replication of project activities and models in other countries.

²³¹ (<https://www.decadeonrestoration.org/>)

- 223.** The Project will operate on the principle of maximal transparency. The Rangeland Stewardship Portal will be created to be open source and the Portal will be freely available to any government, organization, or individual who wants to use its data or replicate its systems for use in another geography. The data collected during Project implementation will be shared widely with governments, civil society organizations, and beneficiaries so that they can benefit from the wealth of information collected.
- 224.** CI will also host a Gaborone Declaration for Sustainability in Africa (GDSA) community of practice on rangeland restoration and Sustainable Development Goals. Through interactions with the GDSA and national government, CI will respond to invitations by government and industry to participate in processes to enhance rangeland restoration potential, promote national agricultural legislation, and support corporate policies that enable regenerative, climate-resilient rangeland management. Through the governance mechanisms for the Project, there will be opportunities to identify potential policy incentives and advise on streamlining legislation across ministries to support rangeland restoration under communal land tenure.
- 225.** The project will also create gender-sensitive communications materials, tools, and data that will be shared publicly through CI, the GCF, Herding for Health, the government of Botswana, NGOs, radio, and social media. These communications activities are critical for sharing information about the project and climate change in southern Africa, but also for informing the people of Botswana about this Project.

Contribution to the Enabling and Regulatory Environment

- 226.** The Project is designed to result in the adoption of climate-resilient rangeland management practices in Botswana and to institutionalize these improved practices at multiple levels so that they permanently transform rangeland management and its rangeland economic development strategies (including Grassfed Beef) in Botswana and can be applied more widely in Sub-Saharan Africa.
- 227.** The Project's Farmer Facilitation Teams and Rangeland Stewardship Agreements ensure restoration investments use the established principles of Free, Prior and Informed Consent (FPIC) when negotiating any agreement with communities to engender consensus and build local capacity that translate into successful Ecosystem-based Adaptation activities (See Feasibility Assessment, Section 4 for more details).
- 228.** The Project takes a holistic approach and engages and advises the BMC, CEDA and private sector entities on ways to optimize value and sustain ecological and social gains via a low-carbon, red-meat value chain (Table 12). These principles of responsible production will be of value to private sector actors and by demonstrating the economic benefits of climate smart production, may compel other actors, including governments to adopt similar models or create the incentives and enabling environments that will allow this model to thrive.

- 229.** Anticipated benefits/outcomes from widescale implementation of the H4H Rangeland Stewardship model are supported by the government of Botswana and include increased agricultural productivity due to healthy rangelands, reduced stocking rates and correct land-use management; increased profit due to reduced livestock loss and human-wildlife conflict, as well as decreased land-management costs such as fences, bush clearing, and erosion control; social development through employment and capacitation of restoration workers and professionalized herders; improved sustainability for BMC and other domestic and export abattoir operations, and ultimately, increased knowledge of and resilience to climate change through adoption of climate-resilient agricultural practices that are currently in demand by growing consumer markets.
- 230.** The success of this Project and the extensive buy-in from a wide variety of local and national government divisions will influence the development and uptake of policies and regulations that will allow for the replication and scaling of Project interventions. The Project seeks to contribute to the harmonization of policies related to communal areas including land tenure, management rights, red-meat value chain development, and enforcement mechanisms.
- 231.** Other Project impacts that will transform the enabling environment in Botswana include:
- Transformation of the *Ipelegeng* Programme, the government of Botswana's job creation initiative, into a vehicle to employ Ecorangers and graduate monitors for rangeland restoration and climate-resilient livestock production. The government currently spends nearly US\$65 million per year on *Ipelegeng* and provides 70% of the country's formal employment (see Annex 6) The government is seeking to develop new professions, like Ecorangers, to better utilize this investment while building resilience to climate change.
 - Formalization of a professional qualification for herding that includes climate change training and roll-out through the Botswana University Agriculture and Natural Resource Centre for In-Service and Continued Education. This professionalization of herding will bring new respect for herders and provide a path to both professional success while maintaining their cultural traditions and indigenous knowledge.
 - 6000 Ecorangers, Restoration Workers, and Graduate Monitors deployed in current beef value chains and new monitoring systems in Botswana, thereby enhancing local traceability system (BAITS) that can be converted into increased market value and sustainability.
 - Empowerment of communal farmers in ecosystem governance and climate resilient supply chains that build community structures and social enterprises for adaptive capacity and financial sustainability.

- Enhanced capacity of the government of Botswana to implement climate-resilient livestock production monitoring and the Project's impacts on Botswana's NAP and SDG targets.
- Collection of critical data on climate impacts, livestock production, ecosystem services, fire frequency, and land management that will be used by various government ministries and departments to support additional activities to address climate change. The data collected by the Project will also be fed back to communities and individual farmers so that they can understand the value of the management strategies adopted, and adapt their grazing and land management plans according to the observed response.
- Participation by communal farmers in discussions on regulations related to BMC privatisation and implementation of Commodity-based Trade.

Overall contribution to Climate-Resilient Development Pathways

- 232.** The rehabilitation of Botswana's rangelands could contribute not only to local ecosystem health, enhanced livelihoods, household adaptive capacity, and rural populations' food security, but also to global climate resilience through maintenance and building of rangeland carbon sequestration potential. The Project activities are holistically designed to build and demonstrate effective low-carbon development by showing the potential of improved rangeland management to both improve farmers' lives and reduce emissions.
- 233.** Nationally, the Project activities catalyse innovative new approaches for the communal livestock farming sector and economic participation that contribute to National Transformation Strategy priorities of economic diversification, improved competitiveness and productivity, and engendering self-reliance and dignity. This paradigm shift will be realised through the Project's delivery of the following:
- Strengthen citizens and local governance structures to be responsible for their own climate-resilient development.
 - Direct employment for 83 Project staff (71% based in rural target districts) and 6000 professional herders, called Ecorangers, Restoration Workers, and Graduate Monitors (100% in rural districts).
 - Developing and deploying a professional qualification and accredited training curriculum for herders developed and implemented by BUAN's Centre for In-service and Continued Education.
 - Re-purposing of job-creation programme investments from the Ministry of Local Government into restoring degraded rangelands and supporting improved livestock management in communal rangelands.

- Using ICT and drone technology, and re-skill and train extension capacity of the Ministry of Agriculture and Food Security to proactively respond to veterinary disease threats that are made more severe by climate change.
- Facilitate private sector understanding and implementation of Commodity-based Trade from RSA-compliant farmers in the country's Red Zones to increase GDP contribution from the traditional livestock-farming sector in these areas that cannot currently access formal markets.
- Unlock value-addition livestock product markets and income generation opportunities for 247,000 individuals, particularly for women and youth, measurably reducing their social grant dependency.
- Support DVS, BMC, and local abattoirs to promote Botswana as a nation of "low-carbon", wildlife-friendly beef production for export markets in line with the National Beef Cluster Strategy.
- Restore 4.6 million hectares of degraded rangeland, guided by the Ministry of Environment, that will sustain the country's tourism and beef sectors, which are under increasing climate stress.

D.3. Sustainable development (max. 500 words, approximately 1 page)

Contribution to the Sustainable Development Goals

234. The Project contributes to following Sustainable Development Goals:

1. No poverty; particularly targets 1.1, 1.2, 1.4, 1.5, and 1.B.
2. Zero hunger; particularly targets 2.1, 2.3, 2.4, 2.5, 2.A, 2.B and 2.C.
5. Gender Equality; particularly targets 5.4, 5.5, 5.A, 5.C.
6. Clean Water and Sanitation; particularly targets 6.3, 6.4, 6.6, 6.B.
7. Affordable and clean energy; particularly targets 7.2.
8. Decent work and economic growth; particularly targets 8.2, 8.3, 8.4, 8.5, 8.6, 8.9, 8.10, 8.B.
11. Sustainable cities and communities; particularly targets 11.4, 11.5, 11.A, 11.B.
12. Responsible Consumption and Production; particularly targets 12.2, 12.7, 12.A.
13. Climate Action; particularly targets 13.1, 13.2, 13.3.
15. Life on Land; particularly targets 15.1, 15.3, 15.5, 15.9, 15.A.

Contribution to National Development Goals

235. All Project impacts and co-benefits are aligned with the ecological restoration and climate-resilient development aspirations articulated in Botswana's Vision 2036 and

National Development Plan-11 (2017-2023). The Project is directly aligned to all goals of the National Development Plan (2013) and Vision 2036. Specifically, the Project activities will contribute to the following indicators in the Key Results Area of Enhanced Social Well-being: Share of the Population living under the National Poverty Datum Line; Share of the population living below the poverty line of \$1.90 per day. Additionally, the Project will improve human resource capacity and increase efficiency by enhancing monitoring and evaluation of government job creation investment into the following co-benefits:

Table 17: Project Co-benefits that will be monitored according to emerging Herding for Health protocols²³² which are summarised in Annex 11 Monitoring and Evaluation Plan

Co-benefit	Relevant NDP Indicators	8 Year Project Target
Sustainable Environment	<ol style="list-style-type: none"> 1) Area of land under rehabilitation 2) Area burnt by wildland fires 3) Number of human wildlife conflict (HWC) incidents 4) Level of emissions of greenhouse gases 	<ol style="list-style-type: none"> 1) 46,000 km² under improved management 2) Support for community mobilisation across 104 VDCs and basic firefighting training for 6000 Ecorangers, Restoration Workers, & Graduate Monitors 3) Reduction of HWC incidents through deployment of Ministry of Environment HW Co-existence Strategy at Project sites 4) Reduction from baseline of land-based CO₂ sequestration and livestock-based methane emissions as calculated using SADC recommended methodologies for Tier 2 calculations or National GHG Inventory
Economy and Employment	<ol style="list-style-type: none"> 1) Agriculture contribution to GDP 2) Unemployment 3) Labour productivity growth 	<ol style="list-style-type: none"> 1) % increase of livestock sales from communal lands into the GDP and number of CBT-compliant private sector actors (aligned to the Grassfed Beef Cluster Strategy) 2) Employment of Ecorangers and Graduates (via a new National Ecoranger Programme) 3) % pass rate of Ecorangers for national qualification
Governance and Security	<ol style="list-style-type: none"> 1) Level of Implementation of international commitments and obligations 	<ol style="list-style-type: none"> 1) Project impact measurements and case studies used to inform government reporting on commitments to the UNFCCC, UNCCD, UNCBD, SDGs, and Gaborone Declaration for Sustainability in Africa (Commitment 2)
Health		<ol style="list-style-type: none"> 1) Reduced risk of zoonotic disease outbreaks
Gender Sensitive Development		<ol style="list-style-type: none"> 1) Gender awareness and inclusive governance 2) Equitable engagement and support for women and men

²³² The Herding for Health programme is also in the process of developing a consolidated programme and tool-kit and web-based system for monitoring key environmental indicators.

236. The Project enables pro-poor food production that has lower carbon emissions than feedlot produced meat or conversion for crop production which removes above ground carbon-storing natural vegetation. By bringing communal farmer production and training unemployed youth to support a more sustainable red meat supply chain, the Project can prevent maladaptive developments of maize-based, water-intensive feedlot production of red meat. Importantly, the Project also maintains culturally important traditions and economic activity surrounding livestock production that can further enhance adaptive capacity of the country.

D.4. Needs of recipient (max. 500 words, approximately 1 page)

Project responsiveness to vulnerability of Botswana's rural poor

237. More than 70% of beneficiary income in the Project targeted areas comes from livestock production and the majority of Project beneficiaries make less than the global poverty threshold of \$1.90 per day²³³, making them extremely vulnerable to extreme climate events and the impacts of climate change. The Project seeks to increase this population's livelihoods in a sustainable way to effectively protect this traditional and culturally critical way of life while improving the condition of ecosystems on which this population depends. The very low income levels of the Project beneficiaries necessitate the use of a GCF grant mechanism, rather than a reimbursable financial instrument.

238. The Project will support Botswana in its efforts to increase socio-economic equities. While Botswana is classified as a middle-income country (MIC) due to significant wealth from the diamond sector, it still faces significant development challenges. Current social granting programmes, including *Ipelegeng*, that aim to provide social safety nets have not been able to overcome cyclical, often climate-induced poverty, and high levels of income inequality persist (Botswana has the world's 8th highest Gini coefficient at 53.3)^{234, 235}. Unemployment remains high (approximately 20-27%) and the *Ipelegeng* Programme is increasingly unable to meet job creation demand due to failed crops and loss of livestock from drought²³⁶. This has worsened in recent years, particularly in rural areas where extreme drought conditions attributed to climate change have led to loss of livestock from starvation with devastating effects on economic security at both national and household levels²³⁷.

239. The Project approaches will address unemployment, inequity, and climate resilience in underprivileged, vulnerable village grazing areas. In these target areas, the challenges most often mentioned by farmers during stakeholder engagement were lack of good fodder, lack of water, and poor livestock condition. Through the Project's Rangeland Stewardship Agreements, solutions to these issues will be delivered through

²³³ See Feasibility Section 1, part 2, Climate Change Vulnerability Assessment

²³⁴ <https://www.indexmundi.com/facts/indicators/SI.POV.GINI/rankings>

²³⁵ Poverty has come down to approximately 16%, but some 30% of the population remains just above the poverty line and thus vulnerable to climate shocks. Botswana's level of income inequality, while declining, remains one of the world's highest with a Gini coefficient of 0.52.

²³⁶ See Annex 6, ESMP, Table 5. Between 2009 and 2016, the % of employment in Ipelegeng grew from 43- 68%.

²³⁷ <https://allafrica.com/stories/201808120194.html>

coordinated grazing plans that allow for the recovery (rest) and natural regeneration of rangelands. Rangeland Stewardship Agreements, farmers, Land Boards, and VDCs will be supported to organise and work collectively to sustainably manage their grazing resources. Ecorangers, supported by government co-finance investment in job creation, enables implementation of these grazing plans and improves record-keeping of herd health that can unlock market access options for communal farmers.

- 240.** The Project will organize farmers to improve the impacts of Government support programmes. The Government of Botswana has put measures in place such as subsidized feed during droughts to increase farmers' resilience, but current approaches provide more benefit to commercial farmers than those in the communal sector, who are predominantly the rural poor. By organizing communal farmers, they will have additional leverage to negotiate for assistance from the government – thereby reducing the disparity in services provided to the commercial vs communal sectors. In times of climate stress, the government provides farmers with economic incentives to offtake (sell) cattle, but this incentive/subsidy is only available to those farmers with access to functional water and energy sources required for abattoir operation. By increasing market access to rural communal farmers, the Project will make this economic incentive available to a larger vulnerable population during drought events.
- 241.** The Project will build adaptive capacity in districts with high rural and indigenous populations. Only 4 of the 104 villages have >75% of their income from non-agricultural sources. These “urban villages” of Maun, Gumare in Ngamiland and Bobonang and Madinare in Bobirwa provide demand centres that are largely dependent on provision of agricultural products, particularly meat, from surrounding areas for their populations' food security. Kgalagadi has no urban centre and most meat from the communal lands in this area is consumed for household subsistence. In Ngamiland, 15% of the farmers are illiterate and 51% only have primary education²³⁸. Climate change more dramatically affects the more remote villages the Project is targeting. These areas have a high proportion of indigenous people and the Project will build adaptive capacity in these areas and provide an opportunity to capture and transfer indigenous knowledge of climate adaptation strategies into formal herding training programmes.
- 242.** The Project will be particularly responsive to the rights of women and indigenous people in the Project Areas. They will have a key role in designing and confirming assent with the Rangeland Stewardship Agreements, and representation targets are established in the ESMP and GAP to ensure equitable beneficiation from employment and economic development opportunities.
- 243.** The Project will address the urgent need to reintroduce herding as a tool to control livestock in communal lands. This is a challenging task, as there are currently no institutions to enforce cooperative management of lands (though the Project will aim to

²³⁸ www.statsbots.org/bw/annual-agricultural-survey-report-2017

work with VDCs and Land Boards on including collective management within their current mandates). Herding, supported by government co-finance investment in job creation and skills development, will provide the tools to control livestock movement and monitor rangeland conditions. Herding and holistic rangeland management provide an opportunity to improve rangeland sustainability and livestock husbandry. This will, in turn, build rangeland and livestock resilience in dryland ecosystems while the livelihoods of vulnerable pastoral communities are improved. In addition to the augmented capacity to manage livestock grazing and veterinary health, the disposition of CI-procured long-term assets to beneficiaries and supporting entities in the 104 village grazing areas, and community planning and resource allocation for the maintenance and use of these assets, CI will ensure that direct barriers to adaptive management are sustainably addressed (see Annex 21 for details).

- 244.** The needs of beneficiaries were determined through an extensive consultation process conducted during Proposal development. This engagement was carried out in accordance with the principles of Free, Prior, and Informed Consent (FPIC) with initial introductions to local communities, including indigenous peoples, made through NGO representatives and government employees (often veterinary officers) with pre-existing relationships with the communities. Please see FP Annex 7, Summary of Consultations for more information on community engagements.

Project Responsiveness to Institutional Strengthening Needs

- 245.** The Project will enable three government ministries to adopt transformational rather than incremental change in order to respond to climate risks. Through their close engagement and participation in management structures of the Project, the capacities of Botswana's Ministry of Agriculture, Ministry of Local Government, Ministry of Environment, Ministry of Lands, the department of Forestry and Range resources will all be strengthened. This Project relies on the cooperation between these government bodies and the Project will support their coordinated activities, which will result in more effective operation of the Project and may provide the opportunity for cross pollination of ideas and methods between these departments.
- 246.** The Project also contributes to the gender equity obligations of Botswana in its National Climate Change Strategy and the Ministry of Gender Affairs has offered its list of trained interns to become part of the graduate monitors and/or farmer facilitator teams. In this way, the project is helping this Ministry achieve its goal of mainstreaming gender awareness into policy implementation. Further details on the Project activities and how they relate to the expressed needs of stakeholders obtained during consultation is provided in Table 18a,b.

Table 18: Needs of recipients and how the Project will meet the expressed needs of stakeholders at varying levels
18a. Overview of Stakeholder Needs and Project Activities

Respondent	Expressed Need	Project Activities that Address the Expressed Need
Individuals/Households	<p>Herders: Desire for improved working conditions (especially in climate extremes) and development opportunities</p> <p>Male-headed households: Need for consistent market opportunities, reduced financial expenditure and stress during drought, trust-worthy <i>Modisa (herders)</i></p> <p>Female-headed households: Livestock expertise and training support; income generation opportunities; reduced stress in household relationships</p>	<p>Activity 1.1.3 Climate change, livestock management, gender awareness training activity and provision of new childcare support</p> <p>Activity 1.3.1 Ecoranger qualification development and training</p> <p>Activity 2.2.1 Distribution of Ecoranger/Restoration Worker Personal Protective Equipment and “grazing support package”</p> <p>Activity 2.2.2 Implementation of improved land and livestock management through employment of trained individuals</p> <p>Activity 3.1.1 New market access and enterprise development opportunities</p>
Villages	<p>Village leadership: More sustainable development opportunities; clarity on land-use management responsibilities; reduced human-wildlife conflict; reduced land use conflict</p> <p>Farmers: Incentive and support to enable historic livestock management strategies; more land for livestock grazing; better market access and prices; reduced loss of livestock to predation, drought, and disease.</p>	<p>Activity 1.1.2 Rangeland Stewardship Agreement development, signing, and governance training support</p> <p>Activity 1.4.2 Rangeland Stewardship Information Portal for information and support for clarifying spatial land-use priorities;</p> <p>Activity 2.2.2 Implementation of improved land and livestock management</p> <p>Activity 3.1.1 New market access for livestock sales</p> <p>Activity 3.1.2 Training and support for enterprise development opportunities within climate smart value-chains</p>
Local governments	Sustainable development opportunities in rural areas; structures and resources that enable better service delivery	<p>Activity 1.2.2 Improved <i>Ipelegeng</i> job creation for rangeland stewardship activities</p> <p>Activity 1.2.3 Improved Veterinary Services and enabling of Commodity-based Trade</p>
Indigenous People	Opportunities to develop; Protection of rangelands for cultural practices, opportunities to express our needs	<p>Activity 1.3.1 Rangeland Stewardship Information Portal for information and support for clarifying spatial land-use priorities</p> <p>Activity 2.2.1 New job opportunities in restoration and herding with professional training and qualifications</p> <p>Activity 2.2.2 Implementation of improved land and livestock management</p> <p>Activity 3.1.1 New market access for livestock sales</p> <p>Activity 3.1.2 Training and support for enterprise development opportunities within climate smart value-chains</p>
National NGOs	Support to implement ideas for better farming development; Additional training; Opportunities to expand support to communities we work with; platform to all work together on this effort and ensure lessons are informing government policy and programmes	<p>Activity 1.1.1 Training of new Farmer Facilitation Teams that include staff of local NGOs and CBOs</p> <p>Activity 1.2.1 Establish a multi-sectoral project steering committee to enable coordination and lessons sharing</p>

Private Sector	Consistency and access to new livestock supply from communal lands; governance structures to work through at the community level; opportunities to respond to climate change impacts	Activity 1.1.2 Rangeland Stewardship Agreement development, signing, and governance training support Activity 2.2.2 Improved livestock condition resulting in improved meat product availability Activity 3.1.1 New market access for livestock sales Activity 3.2.2: Engage key market players on climate-resilient livestock production protocol development
National Government	Better use of <i>Ipelegeng</i> investment; inclusion of marginalized farmers in value-chains; more resilient beef sector; reduction of impact of climate shocks on services and budgets	Activity 1.2.2 Improved <i>Ipelegeng</i> job creation for rangeland stewardship activities Activity 2.2.2 Implementation of improved land and livestock management Activity 3.1.1 New market access for livestock sales Activity 3.2.2: Engage key market players on climate-resilient livestock production protocol development and more resilient enterprise financing

18b. Summary of Private Sector and Financier Needs and CI's Engagement Strategy: Summarised from Meat Naturally Business Plan (Annex 2, Appendix 5.2), AHEAD GAP Analysis (Annex 2, Appendix 5.6) and interviews with representatives of BMC, Meat Naturally Botswana, two private export abattoirs, a feedlot operator, and a local authority abattoir. In addition, CEDA's head of development for livestock investments was consulted regularly on characteristics, challenges, and opportunities for alignment of its financing of private sector parties involved in livestock product value chains.

Needs of the Private Sector	Engagement Strategy
<p>Ensure more consistent supply of animals to meet existing export contracts:</p> <p>BMC Maun, Batawana Abattoir, and Ngamiland Abattoir all indicated that disruptions in supply and poor quality of animals reaching the abattoir create challenges for meeting their export quotas and contractual arrangements. They are often forced to scramble to reach supply targets, farmers don't know where their cattle are, and taking days to find cattle after negotiating a sale agreement is a significant challenge.</p>	<p>Based on lessons learned in South Africa, CI will enter into an agreement with Meat Naturally to lead business development strategies for each cluster (see paragraph 156 and Activity 3.1.1b). Meat Naturally Botswana is already undertaking value-chain discussions with other licensed abattoirs on the nature and timing of sales from the demonstration sites in Year 2. The Project's Commodity-based Trade Director (DVS secondment) will participate in MoA operational discussions for the BMC in Maun and Francistown (Activity 3.2.2b). At the local level, FFTs in a cluster area and the Enterprise Development Manager (CI staff) will have regular contact with BMC and private sector abattoirs and butcheries in their area to understand the status of demand help secure purchase agreements between farmer associations and abattoirs / buyers.</p>
<p>Build the capacities to meet Commodity-based trade requirements and in particular the gaps identified in the AHEAD Project that will make export easier:</p> <p>The AHEAD CBT programme extensively engaged with private sector actors during its</p>	<p>DVS has maintained a forum of key private sector stakeholders related to CBT and Farm Assured beef (a certification scheme favored by Woolworths South Africa for its supply chain.) The CI regional H4H Director was part of the AHEAD programme Commodity-based Trade studies and is currently engaged in efforts with</p>

<p>three-year project. The government of Botswana is currently establishing a Meat Regulator that will oversee export direct from farms, and new on-site quarantine regulations have been developed and are expected to be approved by the end of 2021.</p>	<p>Botswana’s DVS and other experts in developing specific regulations.</p> <p>The Project’s DVS Commodity-based Trade Director and Enterprise Development Manager will maintain these bi-annual forum meetings at the national level to ensure ongoing dialogues between policy and business practitioners (Activity 3.2.2.)</p> <p>The project’s COP and/or H4H Implementation Director will attend key sessions when representatives of importation businesses attend these meetings and will contact DVS to assist in securing new purchasing arrangements by showcasing the low emissions and high CBT compliance of the products from the Project sites.</p>
<p><i>The Project will fill information gaps and can guide investment decision-making:</i></p> <p>CEDA indicated that its investments to livestock farmers have the lowest rate of payment and highest default rate in its investment portfolio. At the time of consultation, CEDA was beginning to revise its due diligence for its financing and requested CI’s support in embedding climate considerations in its due diligence process for meat and livestock investments; this support is included as sub-activity in 3.2.2c).</p>	<p>The Enterprise Development Manager will meet monthly with CEDA representatives both in Gaborone and in the Project Areas and will work with CEDA and LEA to design a business development programme that is both climate resilient and fiscally robust.</p> <p>CI will also seek to identify new entrepreneurs during the project market-readiness workshops and connect them to CEDA and LEA for support relationships that will extend beyond the life of the Project.</p>

D.5. Country ownership (max. 500 words, approximately 1 page)

Alignment with National Climate & Development Policies

247. This Project is well aligned with the Botswana Government’s Vision 2036 goals for “an effective climate change response and the long-term, just transition to a climate resilient and lower carbon economy and society” with the intention to “effectively manage inevitable climate change impacts through interventions that build and sustain Botswana’s social, economic and environmental resilience and emergency response capacity”. The Project aims to support implementation of this Vision in the three Project areas and contribute nationally to the development of:

- The draft National Adaptation Strategy for Botswana to be submitted under the UNFCCC as a National Adaptation Plan (NAP) which can draw on Project lessons learned regarding Ecosystem-based Adaptation and Climate-resilient Agriculture;

- New fiscal instruments or allocations and enhancement of existing mechanisms (e.g., *lpelegeng*) that support targets expressed in Botswana’s NDC; and,
- Design of NDC calculations and commitments of Botswana, and, by sharing Project experiences through GDSA and UNFCCC policy platforms, the Project will contribute to Botswana’s international collaborations with other UNFCCC parties and Gaborone Declaration signatory countries with regards to mitigation and adaptation opportunities from rangeland and livestock management.
- Adoption of Tier 2 IPCC emissions inventory methodologies. Previous GHG inventories in Botswana used IPCC Tier 1 methodologies and have indicated the goal of updating these inventories to Tier 2. This project will provide an evidence base for this transition and thereby allow for increased accuracy of GHG reporting by the Government of Botswana to the UNFCCC.

248. The Project aligns with the draft Green Climate Fund Country Programme²³⁹, four of the five National Priority Areas for Climate Finance²⁴⁰, and National Climate Change Policy Strategy and Action Plan (NCCPSAP), which aims to restore rangeland ecosystems and make the livestock sector more resilient to climate change through a coherent approach that will enhance preparedness at all levels of governance and improve rangeland integrity by 2030. The Project also will support the new proactive approach – restoration of degraded rangelands to reduce the impacts of drought on human, livestock, and wildlife populations- and integrate this with the Draft Drought Management Strategy. Finally, CI and its Project partners will support actors in Botswana’s livestock value chain take necessary steps to restore degraded communal rangelands reduce rural populations’ vulnerability to climate change and adopt a low carbon development pathway with multiple potential benefits as part of an inclusive economic development strategy.

249. The Project supports the National Climate Smart Agricultural Programme (2015-2025) through Component 2, specifically targeting building resilience and associated mitigation co-benefits in the agricultural sector. This Component is aligned with Botswana’s National Programme to Combat Desertification (2006) objective 3: “to facilitate capacity building for stakeholders involved in combating desertification and mitigating effects of drought”, where youth and women are specific targets. The Project also will support the national Drought Management Strategy, which is currently in draft form, with localised weather data provision to MET for analysis improved response mobilisation. Ecoranger and Rangeland Restoration Teams will be trained in alignment with the Education and Training Sector Strategic Plan (2015) and contribute to improved

²³⁹ See Annex 2, Section 1, Appendix 1.2

²⁴⁰ See Annex 2, Section 1, Appendix 1.3

climate, livestock, and rangeland monitoring capacity as well as the Economic Stimulus Programme (2015) goal of upskilling 20,000 youth.

250. The Project also supports Botswana’s development policies. The importance of mainstreaming adaptation planning into sectoral planning, including rangeland Ecosystem-based Adaptation is already highlighted in existing climate change documents, including the NDC, and the recently finalised Climate Change Policy objectives of reducing impacts of climate change on agriculture and reducing greenhouse gas emissions²⁴¹. Additionally, the Project’s strategies and Gender Action Plan address three policy goals of the Climate Adaptation Strategy:

- Promote equitable participation of women farmers and female-headed households in Climate Smart Agriculture (CSA) programmes;
- Empowering communities, especially women and youth to actively participate in the implementation of climate change response measures in both rural and urban areas, including women’s voices in natural resources management through their equitable participation in CBNRM processes; and,
- Ensuring that gendered differences of climate change are mainstreamed into climate change education²⁴².

251. The Project activities are designed to be gender responsive or transformative at all levels, enable the full participation of women and female-headed households in disaster management, participate fully in public gatherings through the provision of childcare, and address both the higher vulnerability of women and children through specific targeting of these populations. The Project also recognizes that elderly, children and people living with disability are dependents that may experience greater vulnerability to climate change impacts and must be considered in all project activities, awareness programmes, technologies, finance and capacity building.

252. Finally, the Project supports the following development priorities of the new administration as indicated in the State of the Nation address (SONA) presented in November 2020²⁴³; SONA language below in italics:

- *“The Land Administration Procedures Capacity and Systems (LAPCAS) project was to provide technological solutions for effective management of land. As part of the LAPCAS initiative, Government will establish a National Spatial Data Infrastructure (NSDI) by 2023, which will allow for geo-spatial data sharing. The availability of the NSDI is expected to contribute to the Digital Government Transformation (SmartBots) and also enhance the implementation of the National Spatial Plan (NSP).”*

²⁴¹ FINAL STRATEGY. A National Climate Change Strategy for Botswana, December 2019

²⁴² Ibid.

²⁴³ (<https://www.parliament.gov.bw/index.php/parliamentary-business/sona>)

- As part of Activity 1.4.1, CI will engage and potentially embed the Rangelands Stewardship Information Portal within this broader system.
- *“In an effort to promote citizen economic empowerment, Government is developing the Economic Inclusion Law, which seeks to strengthen the enforcement of citizen economic empowerment initiatives to ensure meaningful participation of citizens in the economy. The law is expected to be presented to Parliament before the end of this financial year.”*
 - All activities under Component 3 are aligned with this new law and with the ambition to create new income sources for 96,000 individuals currently not part of the formal economy.
- *“The beef industry has been besieged with challenges over time and this has affected the different stakeholders within the industry. Government is however, committed to revive the beef industry and to this end utilize the adopted Beef Cluster Model to ensure its competitiveness and sustainability. It is expected that through this model, cattle farmers will get the true market value of their product which will present an opportunity to improve the economic returns to Botswana farmers.”*
 - The Project is structured according to the Beef Cluster Model and creates 9 clusters for production from tribal lands.
- *‘In order to advance SDG implementation, Government, in partnership with United Nations family in Botswana, developed Planning Guidelines to effectively facilitate the integration of SDGs targets and indicators into sectoral strategies and plans, as well as their effective mainstreaming into the national budgeting processes. Currently, the guidelines are being piloted in six selected ministries. Plans are also underway to develop an SDG Financing Strategy, to help leverage domestic, international and private finance to support the realisation of national priorities, including SDGs.’*
 - The Project provides an opportunity for Botswana’s government to demonstrate effective mainstreaming of the SDGs and climate change resilience in its planning.
- *“Government has secured a market to supply goat and sheep meat in the Middle East and Europe, and modalities are underway to meet market regulatory requirements in the targeted countries.”*
 - In order to comply with the traceability requirements of the market, all goats and sheep will be registered under the Botswana Animal Traceability System (BAITS). Farmers will be required to tag their goats and sheep with electronic ear tags as part of compliance. The new WiFi hubs placed in communities under Output 1.4 and the Ecoranger support to livestock farmers on traceability, nutrition and veterinary health will support climate vulnerable communities to participate in this new government-enabled market.
- *“Rural Development Council (RDC) has adopted a value chain approach as a tool to transform community projects into business entities. These community driven initiatives are anchored on the use of the natural resource base that predominantly exist in rural areas to create wealth for the rural economies. The RDC intends to replicate successful business initiatives in other parts of the country.”*
 - Component 3 activities will implement this approach in 104 communities using rangeland restoration and livestock as the anchor investment area.

- *‘Government is also making concerted efforts to improve the state of Customary Courts and Kgotla offices. To this end, the refurbishment of eleven (11) Customary Courts were completed by September 2020. Furthermore, WiFi connection for fifty (50) Kgotla offices across the country is ongoing and is expected to be completed in March, 2021. This initiative will provide access to WiFi services to communities of these areas providing yet another opportunity for youth businesses to grow.’*
 - Through Output 1.4, the Project will also secure WiFi infrastructure and connectivity that can be placed at Kgotla offices in last-mile communities that can benefit from this national expansion effort. The Project WiFi hubs will not be used exclusively for Project monitoring; the Project is explicitly designed to use this as a means of increasing youth participation and development of online skills through enabling government co-financed graduate monitors to design and manage village level web-platforms for the Project monitoring in the form of a “Climate Diary for xx Community” which will capture and share lessons from each community in a way that is more engaging for youth and future generations. This can be a model that can easily be expanded through the national investment in core infrastructure.

Role and Capacities of Project Partners

- 253.** Three ministries are direct participants in the Project, which will strengthen their capacity to integrate climate change considerations into their planning and support functions.
- The **Ministry of Agricultural Development and Food Security (MoA)** is the Project Lead and host organization. The MoA implements numerous programmes aimed at social upliftment and economic development aligned to Vision 2036 and the National Development Plan. Specific initiatives that this Project will draw on are Livestock Management and Infrastructure Development (LIMID), Farmer Training, Department of Agricultural Research (DAR) /and Department of Animal Production (DAP) livestock genetics, and DVS disease control. The MoA’s Rural Training Centres will be used as venues for all training programmes, providing significant in-kind support. MoA extension officers and veterinary support will also be key members of the Farmer Facilitator Teams to provide training and support in the new Rangeland Stewardship Approach.
 - The **Ministry of Environment, Natural Resources and Tourism** implements climate, rangeland and wildlife ecology knowledge and outreach and CBNRM policies are critical to the Project. Local and district Department of Forestry and Range Resources (DFRR) officials will supervise new human resource capacity working on the Project to be part of Farmer Facilitator Teams to contribute rangeland and soil rehabilitation expertise into the communal land management plans and agreements. This is also key to linking feedback into reports on international obligations, such as SDGs, UNFCCC, GDSA. The Project will also provide reports to the Ministry’s Climate Change Committee who will draft national communications and commitments to the UNFCCC. Finally, this Ministry will be engaged in policy work related to formal recognition of Rangeland Stewardship

Agreements in the conservation framework of the country as part of sustaining the project interventions.²⁴⁴

- The **Ministry of Local Government's Ipelegeng** Programme is a job creation initiative that provides public-funded employment for up to 60,000 people per month. Through this Project, the Programme's resources will be used to pilot deployment of *Ipelegeng* to rehabilitate rangelands and implement planned grazing practices. Ultimately, the target will be that 10% of *Ipelegeng* (6000 people per annum) will be continually supported to replicate and scale the Project approach on communal lands linked to improved market access as a uniquely transformational, sustainable approach.

254. There are several other Government of Botswana entities that will make key Project contributions that align with their mandates:

- The **Ministry of Nationality Immigration and Gender Affairs** will guide planning and implementation to ensure issues related to gender equity are core to the programme. They will aid the Project team's implementation of the Project GAP and GCF gender mainstreaming guidelines and promote synergies with the National Policy on Gender and Development (NPGAD).
- The **National Strategy Office** will support Project monitoring alignment with National Development Plans (NDP) Performance Monitoring Framework, which will draw on information from the Rangeland Stewardship Information Portal, to ensure outcomes and data from the Portal support national strategies.
- The **Citizen Enterprise Development Agency (CEDA)** provides a range of financing and enterprise development support that will support value chain development and therefore contribute significantly to the success of this Project. The Project team will work with CEDA to connect CEDA directly to farmers, entrepreneurs, and other actors seeking to build climate-resilient value chain options. The Project will also work with CEDA to develop new lending protocols that reduce climate risk and unlock enterprise development financing for Project participants.
- The **Botswana Meat Commission** provides slaughter and processing facilities in the Project areas and is therefore a key market player²⁴⁵. The BMC management is fully supportive of the Project and its interventions to improve the overall consistency and quality of supply to its facilities. The BMC primarily sells to high-end buyers and when supply is insufficient or of poor quality, the BMC is forced to shut down for extended periods of time. The Project EbA impacts will help ensure a steady supply of high-quality cattle to the BMC and create new, sustainable opportunities for communal farmers.

²⁴⁴ In South Africa, CI promoted and obtained a legislative category for stewardship on communal grazing lands which now recognizes conservation agreements with communities as an IUCN Cat II reserve.

https://www.researchgate.net/publication/339875914_BIODIVERSITY_STEWARDSHIP_GUIDELINE_2018_South_Africa

²⁴⁵ The BMC was not operational during proposal development and is currently going through a process of privatization. As such, it is not possible to provide specific details regarding complementarity. However, CI had positive engagements with the BMC management in Ngamiland and Gaborone and CI has an extensive track record of engaging with large businesses to improve environmental and social practice. CI will deploy this expertise through a dedicated Enterprise Development staff member who will have access to CI's global and African network of experts to support engagement with BMC for the achievement of project goals

- Through the Project Steering Committee chair, the Project will deliver presentations to **Rural Extension Coordination Committee (RECC)** and will receive regular updates on Project interventions, successes and lessons learned. The RECC represents 80 government departments and meets three times a year to align government agency efforts and bridge policy-implementation gaps. It is therefore a useful mechanism for sharing Project information across the government of Botswana.

Regulatory Environment and Context

255. Botswana's regulatory environment is particularly favourable for the Project's successful implementation. Three key areas of the regulatory environment will impact the Project's success or failure:

- *Legislation creating job creation for the public good* has been in existence since the 1960's and the new President committed to calls for transformation of the *Ipelegeng* programme (some of which came through stakeholder engagement during the development of this FP) in the recent State of the Nation address on 9 November 2020 to "re-engineer the *Ipelegeng* programme to focus on maintenance of public facilities and implementation of development projects at the local level" and "to empower beneficiaries through capacity building and development of technical skills for sustained livelihoods." Thus, the government commitment to the Project approach is likely to be secured and sustained and associated evolving strategies to re-vamp *Ipelegeng* will continue. Should this momentum falter and the *Ipelegeng* programme not be willing to transform, the Project will need to be restructured significantly as this commitment from a re-alignment of *Ipelegeng* is critical to the project success.
- *Legislation on biodiversity conservation and veterinary disease management* have historically been in conflict in Botswana. Veterinary fences established through agricultural regulations have cut off wildlife migrations and led to damaging environmental and wildlife impacts that appear to contradict the country's progressive and far-reaching conservation laws. Detailed policy assessments are provided in the Feasibility Study Appendix 4.6 (environment and conservation agreements) and Appendix 5.6 (veterinary disease management and CBT) The Project promotes new management practices that are not prohibited by either set of regulation, and adoption of these practices is expected to lead to a reduced need for enforcement against illegal killing of wildlife or maintenance of fences that have limited effectiveness across the Project Area landscapes (as evidenced by the FMD outbreak in Ngamiland in October 2020.) New regulations for on-farm quarantine were promulgated in 2020, creating the foundational shift from exclusively state-run quarantine facilities. With small revisions, these new regulations will be applicable for communal herds managed by Ecorangers,

which DVS officials indicate will be in place by March 2022 and can be tested at the Project demonstration sites.

- *Legislation on economic inclusion and beef cluster development* are new initiatives that have gained political momentum since 2018, with new regulations expected in 2021 to support both. Parastatals CEDA and BMC, among others, are already embracing the tone of the political movement and as a result have committed (CEDA) or indicated interest (BMC management) to support this project as an exemplar of how climate resilience can become a modus for transitioning and building local, inclusive economic empowerment to achieve a paradigm shift for the livestock sector. Additional information on the regulatory and policy environment is available in Annex 2, section 4.

D.6. Efficiency and effectiveness

- 256.** The GCF investment into this Project provides a transformative spark that will compel inter-ministerial alignment of current investments across job creation, CBNRM, and livestock production into new working arrangements to facilitate effective deployment of EbA. The Project will align and coordinate government and NGO investments into a single national effort to achieve long-term resilient ecosystems and the communal farming livelihoods dependent on these rangelands. The scale of this leveraged investment is significant for the eight-year Project, but more importantly, it sets a precedent for how the government and civil society funding can be used in the future to match appeals for global climate finance for implementation of the Botswana's Climate Change Response Strategy.
- 257.** While CI and the GoB explored the option of running the Project through 15 sub-grants, due to the siloed nature of government and limited presence of NGOs/CBOs in two of the three target areas, it was determined that the most effective approach would be for CI to hire and train area-based scientific teams as well as peer positions for each of the nine clusters. This approach will create a cadre of skilled individuals that can move into a variety of institutions that are currently under-capacitated and will require their expertise for replication of the work in Botswana's other districts. As an organization, CI is committed to building local capacity, and opportunities for embedding staff into other institutions will be pursued as part of cost-effective sustainability and replication plans.
- 258.** The Project will deliver tangible benefits that respond to direct needs of beneficiary communities. The rate of uptake of improved management practices will be rapid by building on existing relationships with livestock farming communities. Through a holistic approach that incentivizes inclusion of rangeland restoration support in the programmes of numerous partners and stakeholders, and the development of farmer-owned social enterprises, the Project design will be more effective and efficient by combining ecosystem restoration and adaptation activities with broader development programmes. The Project also can draw on Meat Naturally Pty.'s experience and technologies successfully deployed in South Africa's communal farming context. As such, it has a high potential for rapid delivery that can then be used to unlock further internal government, donor, or market investments for replication in Botswana and elsewhere in Africa.

- 259.** Investments in this restoration programme that fully supports communities' existing livelihoods, creates a new scale of impact, and can be achieved at a GCF-funded cost efficiency of \$8.00 per hectare. The low cost of restoration is important as the annual cost of land degradation in Botswana is estimated to be US\$353 million, equivalent to 3.2% of the country's GDP²⁴⁶.
- 260.** Through a Financial and Economic Analysis (FEA), it is projected that the Net Present Value (NPV) generated by the Project over its 20-year lifespan will be US \$273 per direct farming beneficiary. This represents a more than seven-fold increase relative to the Without Project Scenario, and significantly more than the NPV generated by individual Project Components. Note that this is a conservative estimate of NPV, as the Financial and Economic Analysis (FEA) includes only one drought event during the model period. The FEA also projects cattle losses to decrease from 28% (BAU) to 10% under the with-Project scenario - however, these estimates will be revised when improved baseline data are collected. The Economic Internal Rate of Return (EIRR) of the Project is calculated to be 186%, and the Financial Internal Rate of Return (FIRR) is calculated to be 1409%. However, for Projects such as this one, with fluctuating annualized net benefits, research has shown that the IRR is a less reliable metric. Please see Annex 3 FEA, and Annex 2 - Feasibility Study, Section 2 for more information.
- 261.** Given that the total cost of the Project is US\$97.6 million, and that the project should result in the mitigation of ~21.5 million tCO₂e, the cost of mitigation is estimated at US\$4.54 per tCO₂e. If calculated solely against the estimated 30% of the project budget allocated for mitigation, the cost per tCO₂e is \$1.36. This potential to enhance carbon sequestration at a low cost per ton of CO₂eq will provide an attractive element for Botswana to showcase so that other countries with similar mitigation objectives can adopt similar approach.
- 262.** The total cost per direct beneficiary over 8.5 years is US\$149 (US\$36.8 million GCF grant / 247,000 beneficiaries). This cost reflects the low population density in the Project target areas (particularly Kalagadi - ~0.5 individuals / km) but is reasonable when compared with investments for similar projects on the continent. A similar programme, the Ethiopian Productive Safety Net Programme (EPSNP) was funded by the World Bank at a cost of US\$315 per beneficiary for the first five years starting in 2007²⁴⁷. Due to the site-specific variations and the different restoration technique investments that may be selected by communities, it is not possible to calculate an exact cost per beneficiary per region at this time. Based on implementation across three similar sites in South Africa, the cost per beneficiary is higher in low-density population areas where transport costs are high relative to the number of people benefiting. Low population density areas also are more challenging implementation areas as they have limited economic activity, slower rangeland recovery timeframes, and smaller local demand for goods and services. Based on these factors, it is likely that Kgalagadi will have the highest cost per beneficiary. Despite higher costs, the targeted areas are home to the most vulnerable populations, and also have rich indigenous cultures where some of the best lessons on practices that maintain ecological integrity under extreme climate stress can be learned and replicated.

²⁴⁶ E. Nkonya, A. Mirzabae, J. von Braun, Economics of Land Degradation and Improvement - A Global Assessment for Sustainable Development (Springer Open, Heidelberg New York Dordrecht London, 2016)

²⁴⁷ Ethiopia Rural Productive Safety Net Project. World Bank Project Database. <https://projects.worldbank.org/en/projects-operations/project-detail/P163438?lang=en>

- 263.** The co-finance investment to be provided by the GoB's *Ipelegeng* programme for the employment and in-service training of 6,000 individuals, and the administrative costs associated with payments to these employees is significant but reflects Botswana's relatively high minimum wage for agricultural employment (which increased by 17% on July 1, 2019 to \$100 per month). Similarly, due to the low population, availability of skilled workers, and a mining-based economy, salaries for professional positions are also relatively high compared with other countries in the region. For comparison, however, South Africa, the SANRMP investment was justified based on the cost for generation of a full-time job, which was US\$2,132. Currently, South Africa invests US\$250 million per annum on the programme due to the high socio-economic and natural resource benefits²⁴⁸. The co-finance contribution to this Project represents only 10% of the total *Ipelegeng* programme budget per annum. As such, once basic systems for an *Ipelegeng* Rangeland Stewardship Programme (Output 1.2) are in place, replication of the Project model across the country will be probable and cost-effective through Botswana's standing budgetary priority to support job creation nationwide.
- 264.** Cost effective replication throughout Africa can also be anticipated. Over the last 15 years, the number of African countries implementing major social protection Programmes for poor and vulnerable people has tripled, with internal and external (primarily World Bank) financing²⁴⁹. This trend is likely to continue, particularly in response to COVID-19 economic slowdowns and new opportunities to influence their deployment into rangeland restoration will be heightened due to the launch of the UN Decade for Restoration. Through GDSA, AFR100, and other forums, other African countries will be exposed to lessons from this Botswana Project and be able to integrate the rangeland restoration model into their own efforts.

²⁴⁸ Environmental Programmes Parliamentary Briefing on EPWP and Job Creation (2019). Available at: <https://static.pmg.org.za/180606EPWP.pdf>

²⁴⁹ Cristilla, C. and R. Tebaldi, 2016. Social Protection in Africa: an Inventory of Non-contributory Programmes. www.ipc-undp.org.

E. LOGICAL FRAMEWORK

This section refers to the Project/programme's logical framework in accordance with the GCF's [Performance Measurement Frameworks](#) under the [Results Management Framework](#) to which the Project/programme contributes as a whole, including in respect of any co-financing.

E.1. Paradigm shift objectives

Please select the appropriated expected result. For cross-cutting proposals, tick both.

- Shift to low-emission sustainable development pathways
- Increased climate resilient sustainable development

E.2. Core indicator targets

E.2.1. Expected tonnes of carbon dioxide equivalent (t CO ₂ eq) to be reduced or avoided (mitigation only)	Annual	587,937 t CO ₂ eq ²⁵⁰
	Lifetime	21,513,100 t CO ₂ eq ²⁵¹
E.2.2. Estimated cost per t CO ₂ eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)	(a) Total Project financing	<u>97,633,023</u> USD
	(b) Requested GCF amount	<u>36,760,394</u> USD
	(c) Expected lifetime emission reductions	<u>21,513,100</u> t CO ₂ eq
	(d) Estimated cost per t CO₂eq (d = a / c)	<u>\$4.54</u> USD / t CO₂eq
	(e) Estimated GCF cost per t CO₂eq removed (e = b / c)	<u>\$1.71</u> USD / t CO₂eq
E.2.3. Expected volume of finance to be leveraged by the proposed Project/programme as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)	(f) Total finance leveraged	<u>\$60,872,629</u> USD
	(g) Public source co-financed	<u>\$54,013,138</u> USD
	(h) Private source finance leveraged	
	(i) Total Leverage ratio (i = f / b)	<u>1.66</u>
	(j) Public source co-financing ratio (j = g / b)	<u>1.47</u>
	(k) Private source leverage ratio (k = h / b)	_____

²⁵⁰ Annual emissions presented as the per year emissions equivalent for the 8-year Project period.

²⁵¹ Lifetime emissions reduction calculated for a 20-year period. Full calculations are provided in the Feasibility Assessment Section 3.

E.2.4. Expected total number of direct and indirect beneficiaries, (disaggregated by sex)	Direct	Women: 133,400 Men: 113,600 Total: 247,000
	Indirect	Women: 1,182,556 Men: 1,107,444 Total: 2,290,000
E.2.5. Number of beneficiaries relative to total population (disaggregated by sex)	Direct	11% (Expressed as %) of country(ies) population
	Indirect	100% (Expressed as %) of country(ies) population

E.3. Fund-level impacts

Expected Results	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
<i>M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks</i>	<i>M4.1 Tonnes of carbon dioxide equivalent (t CO₂ eq) reduced or avoided (including increased removals) - forest and land use</i>	Botswana GHG Inventory StatsBots Annual Agricultural Survey Report	0 tCO ₂ e emissions reduction from baseline Ngamiland: livestock: 0 tCO ₂ e soil: 0tCO ₂ e Kgalagadi: livestock: 0 tCO ₂ e	797,430 tCO ₂ e emissions reduction from baseline ¹⁵⁹ Ngamiland: livestock: 61,394tCO ₂ e soil: 360,324tCO ₂ e	4,703,498 tCO ₂ e emissions reduction from baseline Ngamiland: livestock: 282,752tCO ₂ e soil: 2,204,675tCO ₂ e	Improved climate-resilient rangeland management practices result in feed systems that translate into reduced enteric fermentation emissions, and increases in vegetation and soil sequestration and avoidance of emissions from degradation over 3.67Mha* *4.6M under improved management with 80% effectiveness rate ¹⁶⁰ .

¹⁵⁹ See Feasibility Assessment Section 3 for calculations

¹⁶⁰ See Feasibility Assessment Section 3 for full description of assumptions.

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		Project monitoring of livestock and rangeland condition ²⁵²	soil: 0tCO ₂ e Bobirwa: livestock: 0 tCO ₂ e soil: 0tCO ₂ e	Kgalagadi: livestock: 37,935tCO ₂ e soil: 222,746tCO ₂ e Bobirwa: livestock: 16,744tCO ₂ e soil: 98,270tCO ₂ e	Kgalagadi: livestock: 174,792tCO ₂ e soil: 1,362,890tCO ₂ e Bobirwa: livestock: 77,144tCO ₂ e soil: 601,275tCO ₂ e	Methodologies applied: Please see Annex 22 and Annex 2, Feasibility Study, Section 3 and the approaches referred to in Output 2.2 below. Project lifetime: 20 years ²⁵³ Average Annual Emissions Reductions: 587,937tCO ₂ e/year Final Target (lifetime): Livestock: 2,557,525tCO ₂ e Soil: 18,935,574tCO ₂ e ²⁵⁴
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²⁵² See Output 2.2 below for sub-indicators and monitoring methods

²⁵³ The project interventions are expected to result in lasting transformation of the livestock sector. A conservative estimate of the lifetime ERs has been calculated for 20 years, which corresponds to the period of the project's financial analysis. An assumption is made that financial viability of the interventions of the twenty year period will result in the sustainability of the interventions and therefore the continued reduction of emissions.

²⁵⁴ The majority of the soil carbon benefits achieved through the project will not be directly measurable within the project implementation period because soil equilibrium requires 15–25 years to be reached. Responses in the soil carbon stocks lag behind vegetation indices, which in turn lag behind management activity indices. As described in Section E.5 of the FP, the project will monitor and report on management activity indicators. In addition, the M&E team will conduct detailed veld condition assessments to monitor key vegetation indices that contribute to soil carbon improvements (Described in Annex 11). These assessments will be supplemented by more frequent reports from Ecorangers and graduate monitors on soil moisture as well as remote sensing analyses on % bare ground where soil carbon gains from restoration are greatest (as described in Annex 11). The results of these M&E activities will be captured in the Rangeland Stewardship Information Portal for further analysis. Soil carbon benefits will be estimated and validated using biogeochemical modelling approaches (Ritchie 2014) in a manner consistent with the Verified Carbon Standard methodology VM0032.

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<p><i>A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities and regions</i></p>	<p><i>A1.2 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including fisheries, agriculture, tourism, etc.)</i></p>	<p>Rangeland Stewardship Information Portal (new)¹⁶²</p> <p>National job creation Ecorangers and Restoration Workers employment records</p> <p>Project value-chain sales records (as entered in Information Portal) and Enterprise Development Annual reports</p> <p>Stats Botswana Data on Income resilience in target areas: regional economies stable despite climate shocks</p>	<p>Direct beneficiaries: 0</p> <p>Indirect beneficiaries: 0</p>	<p>Direct: At least 60,000 Project beneficiaries</p> <p>(2.6% of national population)</p> <p>(minimum 50% female)</p> <p>By District:</p> <p>Ngamiland: 35,000</p> <p>Kgalagadi: 10,000</p> <p>Bobirwa: 15,000</p> <p>Indirect: At least 200,000 beneficiaries</p> <p>(9% of national population)</p> <p>(minimum 50% female)</p>	<p>Direct: At least 247,000 Project beneficiaries</p> <p>(10.7% of national population)</p> <p>(minimum 50% female)</p> <p>By District:</p> <p>Ngamiland: 140,000</p> <p>Kgalagadi: 47,000</p> <p>Bobirwa: 60,000</p> <p>Indirect: 2.3M beneficiaries</p> <p>(100% of national population)</p> <p>(minimum 50% female)</p>	<p>Direct Beneficiaries are the number of women and men benefiting from diversified, climate resilient livelihood options promoted by the Project¹⁶³</p> <p>Total direct beneficiaries are equal to 80% of the population of the three districts. Improved livelihoods and reduced vulnerability will be measured through annual analysis of the number of males and females with income resilience: (increased household and business income from climate-resilient livestock value-chains, reduced losses of economic assets due to climate shocks, positive impact on regional economic sectors (non livestock) despite climate shocks</p> <p>Indirect beneficiaries will be reached through national policy developments, improved access to climate information, improved value chains in Botswana, and national savings for drought related livestock subsidies that can be made available for other purposes. It is anticipated that the majority of these indirect impacts will be achieved in the second half of Project implementation as data, lessons, and support for policy development are incorporated and deployed into national systems.</p>
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¹⁶² A Rangeland Stewardship Information Portal will be developed by the Project to capture all information on labour, livestock, land, and income indicators on a monthly basis and GHG emissions per target site annually. Where appropriate, the portal will share data management with the Stats Botswana portal (<http://www.statsbots.org.bw/data-portal-0>) See Feasibility Assessment Section 4 for depiction of the Information Portal and its management.

¹⁶³ See Annex 2, Feasibility Assessment Section 4 for beneficiary calculations and explanations.

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<p><i>A4.0 Improved resilience of ecosystems and ecosystem services</i></p>	<p><i>A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change</i></p>	<p>Rangeland Stewardship Information Portal (new) analysis of remote sensing data and ground verification to determine land under improved management</p>	<p>Baseline = 0 ha</p>	<p>Area determined to be under restoration / rehabilitation / grazing / feed system management following RSA guidelines:</p> <p>1,000,000 ha</p>	<p>Area determined to be under restoration / rehabilitation/ grazing / feed system management following RSA guidelines: 4.6Mha under improved management x 80% effectiveness rate = 3,670,000 ha with improved resilience.</p>	<p>Targets are the hectares of ecosystems with improved climate resilience and improved carbon sequestration due to the implementation of Rangeland Stewardship Agreements for improved land and livestock management Ecoranger and Restoration Team actions in accordance with Rangeland Stewardship Agreements enhance ecosystem resilience relative to the BAU and are evaluated / verified to be under improved management.</p>
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E.4. Fund-level outcomes						
Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	<i>A5.1 Institutional and regulatory systems that improve incentives for climate resilience and their effective implementation</i>	Rangeland Stewardship Information Portal (new) Village Grazing Area Agreement Dashboard ¹⁶⁵ Ecoranger Accredited Training Registration Min of Agric Ipelegeng and Dept of Vet Services Dashboard (new) ¹⁶⁶ Biannual report produced for GDSA Sustainability in Africa committee meeting.	No institutional mechanism exists for engaging and measuring effectiveness of national and local stakeholders actions on climate responsive planning or management of communal rangelands	New Rangeland Stewardship planning, skills development, implementation support, and monitoring system for climate responsive management deployed across 30% of targeted communal grazing areas (Effectiveness Level 1-2)	New Rangeland Stewardship planning, skills development, implementation support, and monitoring system for climate responsive management deployed across 80% of targeted communal grazing areas (Effectiveness Level 3-5) and embedded in national accredited training programmes policies and reporting frameworks	All Village Development Committees in the target sub-regions remain active and able to engage in the Project. National Job-Creation, Agricultural Skills Development, and Veterinary Support for Commodity-based Trade remain government implementation priorities.
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	<i>A7.1 Use by vulnerable households, communities, businesses and public-sector services of Fund-supported tools instruments, strategies and activities to respond</i>	Monitoring of compliance of RSA terms (CI staff to evaluate) Rangeland Stewardship Information Portal (new)	Degraded rangelands and limited use of herding across all Village Grazing Areas exposes vulnerable households, communities, and businesses to	Compliance with negotiated terms of Rangeland Stewardship Agreements in 30% of Village Grazing Areas, including implementation of at least one of the following: collective grazing, ecosystem	Compliance with negotiated terms of Rangeland Stewardship Agreements in 80% of Village Grazing Areas, including implementation of collective grazing, ecosystem restoration	Communities are willing to develop and implement RSAs in compliance with the negotiated terms. Ecoranger and Restoration worker actions result in improved ecosystem health and reduced loss of livestock to climate related loss factors (predation, illness, heat

¹⁶⁵ A Project Village Grazing Area Self-Assessment Progress Dashboard will be created for annual performance measurement. Ratings of 0 for no agreement, 1 for conservation agreement development complete but not yet signed or endorsed by Land Board 2 for conservation agreement adopted, signed, and implementation in practice 3 for conservation agreement adopted, signed, and implementation in practice and Land Board supporting enforcement 4 for conservation agreement adopted and stakeholders progress report identifies the year as a "Project Success" according to the criteria established for climate vulnerability reduction in that landscape 5 will be achieved when the RSA is wholly financed by the private sector and enforced by local and community governance structures. At all stages the agreement will also be assessed for empowerment based on agreement equitable representation of interests of male, female, large and small stock owners.

¹⁶⁶ Quantitative and Qualitative Departmental Self Assessments and Stakeholder Assessment Dashboard will be created and implemented

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	<i>to climate change and variability</i>	<p>Livestock sales statistics (Male/Female)</p> <p>National Job Creation Programme statistics on new wages paid to Ecorangers and Restoration Workers (Male/female)</p> <p>Project Baseline and Completion Reports on value-chain participation, including confirmation of secured purchase agreements for RSA compliant farmers (Male/Female)</p>	<p>climate change, and extremely limited livestock trade options minimise adaptive capacity to sell in times of climate stress</p> <p>Baseline; No use of fund supported tools, instruments , strategies or activities – no RSAs are currently in place</p>	<p>restoration activities, and improved livestock management practices - resulting in improvement in climate adaptive capacities including ecosystem condition (i.e., reduced bare ground, improved fodder, improved water availability), livestock health (reduced mortality and morbidity), and improvements to beneficiary incomes</p>	<p>activities, and improved livestock management practices - resulting in improvement in climate adaptive capacities including ecosystem condition (i.e., reduced bare ground, improved fodder, improved water availability), livestock health (reduced mortality and morbidity), and improvements to beneficiary incomes”</p>	<p>stress) than historic baseline as well as control sites. There are no unforeseen barriers (e.g. new diseases/trade barriers) to fund-supported income generation/protection opportunities being readily taken up by beneficiaries and businesses.</p>
M9.0 Improved management of land or forest areas contributing to emissions reductions	<i>M9.1 Hectares of land or forests under improved and effective management that contributes to CO2 emission reductions</i>	New Rangeland Stewardship Portal of all grazing agreement areas	<p>Baseline=0 ha;</p> <p>No communal rangeland under planned grazing management or restoration activities</p>	<p>1,000,000 ha of communal rangeland under improved management through a shift to planned, collective grazing and restoration activities</p>	<p>4,600,000 ha of communal rangeland under improved management through a shift to planned, collective grazing and restoration activities,</p>	<p>Rangelands under improved management contribute more to CO₂ emissions reductions compared to the baseline and control sites.</p>

E.5. Project/programme performance indicators						
Component 1: <i>Strengthening institutions and support systems for climate-responsive planning and management</i>						
Expected Results/Outputs	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
<p>Output 1.1.: New gender equitable structures and systems for climate responsive planning and implementation by communal populations are operationalised</p>	<p>Change in communal population understanding of Rangeland Stewardship Agreements and their relationship to climate-resilient grazing practices and rangeland rehabilitation</p>	<p>Pre and post training assessments on climate-resilient practices</p>	<p>0 training assessments completed</p>	<p>50% correct responses on post-training assessments (measurement of successful training uptake)</p>	<p>90% correct responses on post-training assessments (measurement of successful training uptake)</p>	<p>All Village Development Committees in the target sub-regions remain active and able to collaborate with farmers associations, and community trusts in the Project.</p> <p>Current CBNRM programme review maintains regulatory approach to providing community management rights and VDCs are recognized as legal agents under Local Govt Act of 2012 for this purpose by Land Boards.¹⁶⁹</p> <p>Empowerment and effectiveness will also be evaluated by analysing the equitable inclusion of interests of various groups including men, women, large, and small stock owners</p>

¹⁶⁹ Legislative developments are ongoing and the Project has included an activity for an updated policy review during the first year.

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	Number of stakeholders who have had an opportunity to design and implement a Rangeland Stewardship Agreement	Annual Rangeland Stewardship outreach assessment scorecard disaggregated by gender and # of stock owned	0 Women and men participating in information sessions and training on Rangeland Stewardship Agreements	Female farmers represent at least 30% of signatories of Rangeland Stewardship agreements 25% of farming population in Project areas have been engaged to design Stewardship Agreements (44,100 individuals)	Female farmers represent 40% of signatories of Rangeland Stewardship agreements 80% of farming population in Project areas have been engaged to design Stewardship Agreements (176,500 beneficiaries)	
Output 1.2: New job creation programme and veterinary approach for climate responsiveness are adopted by national departments.	Functional Ministry of Agriculture Ipelegeng Job Creation Programme ¹⁷⁰ enables Ecorangers and Rangeland Restoration Worker deployment on communal rangelands	National Development Plan Monitoring Framework for Social Programmes – Baseline, Midterm, and Final Assessments Animal and Human Health for the Environment (AHEAD)	0	30% improvement in targeting needs of farmers through inclusion of climate change risks and strategies in national job-creation and animal health disease	80% improvement targeting needs of farmers through inclusion of climate change risks and strategies in national job-creation and animal health disease	National Development Social Upliftment Programmes and Department of Veterinary Services remains supportive of the Project and coordination mechanisms across public and private sector stakeholder groups, with gender equitable representation, are actively reviewing and responding to challenges and opportunities to Ecosystem-based Adaptation (EbA) grounded in reducing the risk from climate change in communal rangelands.

¹⁷⁰ The Ipelegeng Programme is “a Government Initiative or programme whose main objective is to provide short term employment support and relief whilst at the same time carrying out essential development Projects that have been identified through the normal development planning process.” (accessed 12/16/19: <http://www.gov.bw/en/Ministries--Authorities/Ministries/Ministry-of-Local-Government-MLG1/Tools-and-Services/Services1/Ipelegeng-Project1/>)

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	Functional Dept of Veterinary Services able to respond to climate risks associated with wildlife-livestock coexistence and enable Commodity-based Trade	Scorecard and Baseline Farmer survey or quantitative measure of effectiveness of Ipelegeng and DVS level of support related to climate change (Baseline, year 4 and year 8)		prevention for climate resilience	prevention across all sub-regions	
Output 1.3. New rangeland management curricula developed and operationalised to expand skills for restoration and regenerative grazing	Ecoranger Training Curriculum Registered & Deployed	Registration Training registers	No formal curriculum deployed for skills training in rangeland restoration and livestock herding in communal lands	Curriculum developed and tested across 9 demonstration Village Grazing Areas	Curriculum formally registered and embedded in national Rangeland Stewardship programme	Accreditation for the Ecoranger Learning Programme curriculum must go through a review and acceptance process by the Botswana Qualifications Authority to receive formal recognition by the country.

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<p>Output 1.4. New rangeland monitoring system is operationalised, embedded, and utilized in market, carbon monitoring, and policy systems</p>	<p>New Rangeland Stewardship Information Portal exists</p> <p>Total number, gender, type (farmer, Ecoranger, VDC, NGO, district, national official), geographic location of users, and type of report requested</p> <p>Change in capacity of trained individuals in designated positions to access and utilise Project-supported information system (including understanding of the information provided and how to use in their work)</p>	<p>Rangeland Stewardship Information Portal</p> <p>User statistics on total number, gender, type (farmer, Ecoranger, VDC, district, national official), geographic location of users, and type of report requested</p> <p>Post-training assessments and change in capacity of trained individuals in designated positions to access and utilise Project-supported information system to plan and adapt management strategies</p>	<p>Climate change and rangeland information are not used for communal rangeland management</p>	<p>Climate responsive RSAs are designed and deployed using data from RSIP by 50% of project communities</p>	<p>Climate responsive RSAs are designed and deployed using data from RSIP by 90% of project communities</p>	<p>Rangeland monitoring continues to be supported by National Strategy Office, Department of Range and Forestry, and is linked to the Min of Agric Botswana Animal Identification System for livestock traceability (BAITS).</p>
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<p>Output 1.5. Improved government policy initiatives on climate change actions and needs, enabling adaptive management</p>	<p>Integration of Project lessons and results into Botswana NDC, National Development Plan, National Gender and Development Strategy, and Gaborone Declaration for Sustainability in Africa Reports</p>	<p>Analysis of national policies and programme budgets (incl. leveraged funding, status of Commodity Based Trade (CBT), regional trade barriers, status of Botswana Meat Commission (BMC), and the overall policy environment.</p> <p>NDC, NDP and GDSA¹⁷¹ contributions reflect rangeland restoration solutions</p>	<p>Baseline = 0;</p> <p>No national rangeland restoration/ herder support programme</p>	<p>Project objectives and lessons represented in the NDC, NDP and GDSA Review documents</p>	<p>Plan for scaling Project to all of Botswana tabled to National Development Plan</p>	<p>Botswana's national economy remains stable and agriculture and employment remain national priorities.</p>
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¹⁷¹ [Gaborone Declaration for Sustainability in Africa](#) is a commitment by 10 (now 14) sub-Saharan African nations to develop sustainably by, for example, infusing natural capital accounting into their national development plans. CI officially became the Secretariat of the Gaborone Declaration in Dec. 2014 and the Declaration was incorporated into the 15th sessions of the African Ministerial Conference on the Environment Cairo Declaration in March 2015.

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Component 2: Reducing GHG emissions and negative livelihood impacts through new job deployment in rangeland rehabilitation, improved livestock management, and climate impact monitoring.

<p>Output 2.1. Job creation and social safety net programmes resourced by the Government are used to deploy restoration teams for climate-resilient land and livestock management in target Project Areas.</p>	<p>Total # of men and women in project areas with new livelihood strategies (skills and employment) related to climate resilient land and livestock management as Ecorangers, Restoration Workers, and Monitors</p>	<p>Employment/ tax registration, training records of Ecorangers/ Restoration workers/Monitors</p> <p>The training ledger will measure attendance (including gender, age, disability, self identified Basarwa) and pass rate will be measured by those that graduate 3 years later as part of output 1.3</p>	<p>0</p>	<p>Number of men: 800</p> <p>Number of women: 1,200</p> <p>Total: 2,000</p>	<p>Number of men: 2,400</p> <p>Number of women: 3,600</p> <p>Total: 6,000</p>	<p>Unemployed are attracted to become Ecorangers and Restoration Workers through the Project-supported link to a national qualification process for participants.</p> <p>Skills improvement will be measured through pass rate / graduation rate of training program.</p>
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<p>Output 2.2. Rehabilitation of ecosystems and improved management of land, soil, and livestock implemented to increase ecosystem productivity, reduce vulnerability of beneficiary populations, and reduce GHG emissions on 4.6 million hectares of climate-vulnerable communal rangelands.</p>	<p>Hectares of degraded land under active restoration (resting, re-seeding, trampling, mulching/organic litter, bush-thinning²⁵⁵)</p>	<p>Annual Ecoranger and Field Monitor data reports</p> <p>Mid-term and final remote sensing analysis report</p> <p>Project and National GHG Inventory</p>	<p>0 ha Baseline 0ha with improved ecosystem resilience and 0 reduced emissions (tCO₂e/yr)</p> <hr/> <p>0 hectares under active restoration, determination of hectares requiring restoration to be determined for each Village Grazing Area</p>	<p>Use of fund supported skills, Ecorangers and mobile livestock support infrastructure results in improvement across 30% of the target Village Grazing Areas in the following key mitigation and ecosystem resilience indicators:</p> <p>X number of hectares under active restoration (TBD based on site assessments)</p>	<p>Use of fund supported skills, Ecorangers and mobile livestock support infrastructure results in improvement across 80% of the target Village Grazing Areas in the following key mitigation and ecosystem resilience indicators:</p> <p>X number of hectares under active restoration (TBD based on site assessments)</p>	<ul style="list-style-type: none"> • Farmers understand, commit, and are enabled to restore their rangelands through grazing agreements. (Output 1.1 is achieved); • Ecorangers and monitors are skilled and empowered by communities to implement and monitor key climatic variables, rangeland restoration, and collective regenerative grazing agreements. (Output 2.1 is achieved); • Outputs 1.1 and 2.2 are pre-conditions for implementing activities for this output; • Emissions are reduced as a result of improved feed systems and ecosystem functions in the target areas. <p>Contributing Sub indicators and Monitoring Methods:</p> <ul style="list-style-type: none"> • Forage palatability: Grass species composition based on veld condition assessments described in Annex 11 supplemented by manure evaluation and fecal nitrogen analyses. <ul style="list-style-type: none"> ○ Linked to livestock mortality and livestock emissions targets • Phytomass (grass above-ground biomass): Disc pasture meter monitoring by Ecorangers/Graduate Monitors and in veld condition assessments described in Annex 11. Supplemented by remote sensing models and satellite-based products such as FAO WaPOR (Annex 2 Section 3 pg. 19–25). <ul style="list-style-type: none"> ○ Linked to ecosystem resilience improvement target (above ground
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²⁵⁵ See Feasibility Study Section 4 for detailed restoration action descriptions.

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	<p>Ecosystem Resilience: X% Reduced bush encroachment and bare ground, X% increase in palatable species composition ratios and water infiltration</p>		<p>Ecosystem Resilience indicator baseline, including water infiltration rates, will be established for each Village Grazing Area</p>	<p>At least 20% improvement in ecosystem resilience indicators across 30% of the target Village Grazing Areas</p>	<p>At least 50% improvement in ecosystem resilience indicators across 80% of the target Village Grazing Areas</p>	<p>biomass is considered <i>de minimis</i> in ER calculations, See Annex 22)</p> <ul style="list-style-type: none"> • Fractional bare ground: Grass basal cover based on veld condition assessments described in Annex 11 and supplemented by remote sensing models. <ul style="list-style-type: none"> ○ Linked to hectares under restoration and ecosystem resilience targets • Livestock numbers and weight: Ecoranger reports captured in the Rangeland Stewardship Information Portal, supplemented by StatsBotswana Annual Agricultural Survey Report <ul style="list-style-type: none"> ○ Linked to livestock health and mortality targets • Fire Incidence: Ecoranger reports captured in the Rangeland Stewardship Information Portal, supplemented by remote sensing MODIS fire products. <ul style="list-style-type: none"> ○ Linked to ecosystem resilience improvement targets • Rangeland condition score: Model estimation using the above sub-indicators and an appropriate veld condition model , such as the Weighted Palatability Composition Method, Benchmark Method, Ecological Index Method, Key Species Method or Degradation Gradient approach. <ul style="list-style-type: none"> ○ Linked to ecosystem resilience and hectares under active restoration targets
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	<p>Livestock resilience: x% decrease in unnatural deaths - climate, road accidents, predation, disease</p>		<p>No change in livestock mortality, Baseline rate TBD</p>	<p>At least 20% decrease in unnatural livestock mortality across all implementing Village Grazing Areas (Phase 1)</p>	<p>At least 50% decrease in unnatural livestock mortality across all implementing Village Grazing Areas (Phase 1, 2, 3)</p>	<ul style="list-style-type: none"> • Soil carbon stocks: Direct soil carbon measurements through soil sampling at veld condition assessment sites and ongoing modelling approach using the above sub-indicators and an appropriate biogeochemical model. <ul style="list-style-type: none"> ○ Linked to ecosystem resilience, hectares under active restoration, and soil carbon ER targets.
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Component 3: Promoting climate-sensitive enterprise development and value-chain investments to sustain transformational change

<p>Output 3.1. Market readiness trainings, enterprise development support, supply chain facilitation, and local level funds build the enabling conditions for improved low-emission livestock value chains</p>	<p>Number of private sector partners engaged in purchase of livestock from RSA compliant farmers</p>	<p>Project Value-Chain Development Reports</p>	<p>Private sector purchases from RSAs:</p>	<p>Private sector entities purchasing from RSA compliant farmers:</p>	<p>Private sector entities purchasing from RSA compliant farmers:</p>	<p>Government, the private sector and other CSA Projects can be leveraged for sustainable livestock production enterprise development and income generation in target regions (e.g. fodder gardens, bush fodder production, leather crafts, etc.).</p> <p>BAITS records are accurate, and a Project backup system is created by the end of year 1.</p> <p>Meat Naturally Botswana systems are available and able to be integrated with BAITS.</p> <p>80% of the Total Population of the Project Area benefits from more increased resilience to climate shocks on the livestock and ecotourism sectors.</p>
	<p>Number of men and women from target communities with new/additional income as a result of Project-enabled livestock or livestock product sales</p> <p>Number of men and women who participate in Project promoted opportunities for livestock sale and livestock sector</p>		<p>Number of livestock value-chain buyer entities (abattoirs, speculators): 0</p>	<p>Number of livestock value-chain buyer entities (abattoirs, speculators): 2</p>	<p>Number of livestock value-chain buyer entities (abattoirs, speculators): 5</p>	
		<p>Rangeland Stewardship Information Portal Report linked to Botswana Animal Identification and Traceability System (BAITS) /Sales data</p>	<p>Livestock Product Beneficiaries : 0</p>	<p>Livestock Product Value Chain Beneficiaries:</p> <p>Number of females: 12,050 Number of males: 11,950 Total: 24,000</p>	<p>Livestock Product Value Chain Beneficiaries:</p> <p>Number of females: 48,200 Number of males: 47,800 Total: 96,000</p>	

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	<p>value-chain development (e.g. fodder gardens, bush-fodder production, fire management, waste and water management enterprises from abattoirs and butcheries, and livestock product (hides and skins) enterprises)</p>					
	<p>Number of men and women within the Project Area that are benefiting from more resilient economic activity.</p>		<p>Rural Economy Beneficiaries : 0</p>	<p>Rural Economy Beneficiaries: Number of females: 21,000 Number of males: 24,000 Total: 45,000</p>	<p>Rural Economy Beneficiaries: Number of females: 82,000 Number of males: 69,000 Total: 151,000</p>	

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<p>Output 3.2.: Selected financiers and value-chain players are aware and supported to incentivise rangeland stewardship and adopt carbon-optimisation practices and technologies</p>	<p>Awareness and operations baseline assessment across key stakeholder groups (commercial farmers, trade partners, tourism sector, local consumers)</p>	<p>Pre-, mid-term, and post Project assessments</p> <p>Project M&E reports</p>	<p>Baseline TBD at Project Inception year 1</p>	<p>30% improvement in awareness in key value-chain player segments</p>	<p>80% improvement in awareness and operations (behaviour & technology) changes</p>	<p>Local organisations can be identified, trained and mentored to implement operations and technology change assessments.</p> <p>Protocol review and revisions (e.g. CEDA loan criteria; BMC operational protocols) occur during the Project period.</p> <p>A specific climate awareness tool will be selected during Year 1 of Project implementation based on local utility.</p>
	<p>Climate resilience awareness and protocols embedded in staff training and strategic decision-making by leadership of key stakeholder groups (BMC, CEDA, other key market players)</p>		<p>No climate resilience considerations in BMC and CEDA strategies</p>	<p>Draft climate resilient production and investment protocols in place and ready for piloting</p>	<p>100% of Targeted Production/ Financing protocols integrate climate relevant criteria and are influencing CEDA investment decisions</p> <p>CEDA investments in livestock production are compliant with new climate-resilience criteria</p>	

E.6. Activities			
Component 1: <i>Strengthening institutions and support systems for climate-responsive planning and management</i>			
Output 1.1.: New gender equitable structures and systems for climate responsive planning and implementation by communal populations are operationalised			
Activity	Description	Sub-activities	Deliverables
Activity 1.1.1. Train a network of at least 9 Farmer Facilitator Teams (Project staff, gov't extension workers, NGO partner field staff, and unemployed graduates) to understand climate-resilient grazing practices and to be able to mobilise collective regenerative grazing agreements	Develop and deploy a Train-the-Trainers Programme for the Project based on the foundation of Herding for Health (H4H) existing training alliance, community mobilisation tools, RARE behaviour change best practices and local and regional climate change and rangeland ecology expertise.	<p>1.1.1a. Develop a Train-the-Trainers change/community mobilisation to work with H4H on demonstration site development</p> <p>1.1.1b. Bi-annual training workshops for Farmer Facilitator Teams and Demonstration Site Implementors on conservation agreement and community mobilisation and monitoring for behaviour change best practices</p> <p>1.1.1c. Community mobilisation and monitoring tool design charrette and follow-up development¹⁷³</p>	<p>1.1.1a. A Train-the-Trainers Module for the short and long-term roll-out of the Rangeland Restoration/Ecoranger Approach to EbA</p> <p>1.1.1b. 225 farmer facilitators and key extension, NGO, and gov't staff co-develop and are trained and developed in the programme stewardship agreement approach and tools in years 1-5 (average of 25 per Cluster with female and Basarwa participants ratios to that in the population of each area)</p> <p>1.1.1c. Appropriate community mobilisation and monitoring tools, Ecorangers job descriptions and management best practice protocols designed for district-specific climatic conditions based on behaviour-change best practice</p>
Activity 1.1.2. Build collective understanding and equally empower male and female participation in Rangeland Stewardship Agreements within	Dedicated legal and gender staff will be hired to work as part of the Project team to implement the ESMP and GAP plans as an integrated component of the inception	<p>1.1.2a. Legal review and guidance based on legislation at Project start on nature and structure of Rangeland Stewardship Agreement</p> <p>1.1.2b. Design and implement a training roadshow (6</p>	<p>1.1.2a. Rangeland Stewardship Agreement Template</p> <p>1.1.2b. Umbrella VDC participation MOUs that confirm engagement prioritisation</p> <p>1.1.2b. & c. At least 32,000 people participate in at least 3 training events</p> <p>1.1.2d. Legally supported Rangeland Stewardship Templates and Agreements</p>

¹⁷³ A charrette is a gathering that empowers local communities as clients for thematic specialists that work with artisans to develop the best interpretation of community needs. The process is most often utilized in architecture but CI has used the approach to design ecotourism strategies, brochures and other communication tools, and infrastructure in the past. The structure for community Rangeland Stewardship diaries and web-site participatory monitoring will be explored here for use by the FFTs and Graduate Monitors in their engagements.

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<p>Botswana's legal and governance framework</p>	<p>engagements, building and ensuring compliance with the Rangeland Stewardship Agreements. Training events specifically on the legalities and best practice on gender equity, indigenous peoples, climate change, and livestock management will be fundamental at the introduction of the Project and further embedded in all local institutions through leadership training and public commitments to Rangeland Stewardship agreements that represent equity principles at village level signing ceremonies.</p>	<p>workshops—2 workshops per Project Area) to umbrella VDCs, Land Boards, and District Development Committees (DDCs) on Rangeland Stewardship Approach in year 1</p> <p>1.1.2.c. Design and implement a training programme on gender awareness, climate change, and livestock management for VDCs and target communities (biannual workshops per Project area and participation in the 9-demonstration sites and 34 Priority Site VDC meetings in alternate months)</p> <p>1.1.2.d. Support legal enforcement of Rangeland Stewardship Agreement</p> <p>1.1.2.e. Empower community governance through leadership training, public signing ceremonies and local governance exchanges to Project demonstration sites</p>	<p>1.1.2e. At least 80 Signing Ceremonies</p> <p>1.1.2e. Five leadership training/champion building hosted for 100 governance representatives (50% women and x% indigenous peoples relevant to the population)</p>
<p>Activity 1.1.3. Replicate and amplify Herding for Health (H4H) approach to develop locally appropriate EbA Rangeland Stewardship agreements, grazing plan designs, and support partnerships across Village Grazing Sites</p>	<p>Farmer facilitators to use process and lessons learned to roll out to all Village Grazing Lands with relevant land management authorities as per activity strategy refined in the demonstration</p>	<p>1.1.3a. Facilitate the development of a network of 9 demonstration sites (3 per region) as learning sites</p> <p>1.1.3b. Train and enable locally facilitated, gender equitable farmer exchanges in the region</p>	<p>1.1.3.a. Nine Learning site MOUs and baselines assessments Stewardship Agreements and Grazing Maps¹⁷⁴</p> <p>1.1.3b. Twenty-seven (27) demo site hosts trained and >1000 people (male and female) participating in farmer exchanges to these sites</p> <p>1.1.3c. Appropriate childcare support identified, and roll-out strategy completed</p>

¹⁷⁴ It is not assumed that the demonstration sites will need to change their existing approach to align with the GCF Project. As long as the practices of rangeland restoration and planned grazing are in place and working, the farmers as their network of support should not feel the need to adopt a new approach. The Project provides the Rangeland Stewardship Agreement and Ipelegeng Ecoranger model for areas still requiring transformation and will seek to learn from existing sites via the Farmer Facilitation Team Network meetings.

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	<p>phase. Starting with 9 training sites, that identify representatives to act as “hosts” to receive additional training (e.g. presentation skills, catering, tour group management skills). These sites will become important demonstration centres for future roll-out within their “village cluster” and where the Project Team can co-develop implementation tools and strategies that reinforce adaptive management.</p>	<p>1.1.3c. Design and test nursery school partnership to ensure women are equally enabled to participate in training and implementation</p> <p>1.1.3d. Design and implement strategy to integrate target demonstration community activities into Rangeland Stewardship Agreement model for all 104 target sites</p>	<p>1.1.3d. Rangeland stewardship agreements with appropriate Land board/CNBNRM actions signed and mechanisms for early warning in place and demonstrating improved understanding and social cohesion around collective grazing in at least 80% of all target areas.</p>
<p>Output 1.2: New job creation programme and veterinary approach for climate responsiveness are adopted by national departments.</p>			
<p>Activity 1.2.1. Support establishment of inter-institutional coordination mechanisms for climate-resilient rangeland management and emissions reduction across gov’t, NGOs, community-based organizations, and farmers’ associations</p>	<p>Establishment of local coordination Forums and a Project Steering Committee of government entity partners with regular reporting into key decision-making structures such as the RDC and RECC.</p>	<p>1.2.1a. Develop and facilitate in Project Steering Committee (or other appropriate network structure in Botswana) including presentation of annual workplans and budgets</p> <p>1.2.1b. Report to Rural Development Council (RDC) and Rural Extension Coordination Committee (RECC) structures via a Project Steering Committee with information relevant to national rural development</p> <p>1.2.1c. Facilitate complementary training collaborations between VDCs</p>	<p>1.2.1a. TOR and membership details for Rangeland Stewardship Forum by end Yr 1</p> <p>1.2.1a. Bi-annual Forum Coordination Meetings at the Project Area level f</p> <p>1.2.1a. National Forums in years 2, 4, 6, & 8</p> <p>1.2.1b. TOR and membership details for the PSC by the end Yr 1</p> <p>1.2.1b Annual PSC meetings in September and presentations to RDC and RECC meetings as requested</p> <p>1.2.1c. At least one formal partnership per Project area with crop, water and sanitation, and health departments with the Project broadening climate resilience outcomes</p>

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		and broader agricultural land, water, and health strategies	
Activity 1.2.2. Support the development of a Rangeland Stewardship job creation initiative under the Ipelegeng Programme within Ministry of Local Government	Project team will work with the Ministry of Local Government to enable dedicated job creation to support rangeland restoration for target regions Ecosystem-based Adaptation (EbA)	<p>1.2.2a. Work with Ministry of Agriculture and Ipelegeng to prepare detailed workplan, budgets, and Standard Operating Procedures for Ecorangers/Restoration Team deployment by the end of year 2.</p> <p>1.2.2.b. Work with MoA to implement agreed preparation and capacity development in year 3.</p> <p>1.2.2c. Work with MoA to generate reports as necessary to the RECC and other national initiatives as requested for alignment purposes.</p>	<p>1.2.2a. Detailed and practical workplan and budget for National Ipelegeng Rangeland Stewardship Programme</p> <p>1.2.2b. Internal capacity for deployment of national programme in place within the MoA</p> <p>1.2.2c. Strategic alignment of the Botswana national job creation programme to support climate resilience goals with other national initiatives</p>
Activity 1.2.3. Expand capacity of Ministry of Agriculture Department of Veterinary Services (DVS) to respond to climate-induced diseases and infections and enable Commodity based Trade in the Project Areas	Project team will expand and assess capacity of Botswana DVS in climate change response strategies to new (emerging) diseases, including; transboundary animal diseases (TADs) vector-borne diseases, pests, and heat / flood induced disease events as well and to understand and enable commodity-based trade (CBT) implementation and compliance in the context of climatic conditions (i.e. different regulations may be required at different temperatures and staff	<p>1.2.3a. Design a capacity building strategy for climate-informed veterinary staff</p> <p>1.2.3b. Integrate climate condition status into regulations and protocols for CBT veterinary checks.</p> <p>1.2.3c. Train and expand veterinary service capacity in target regions in climate-proof CBT protocols</p> <p>1.2.3d. Activate Ecoranger deployment in support of quarantine management for unlocking export markets from target communities</p>	<p>1.2.3a. Capacity-building strategy</p> <p>1.2.3b. Increased DVS capacity through understanding and practice of new regulations and protocols for CBT veterinary checks revised to include climate condition status</p> <p>1.2.3c. Veterinarians and veterinary officers from target regions trained in climate-proof CBT regulations and protocols</p> <p>1.2.3d. Quarantine areas managed by Ecorangers trained in Commodity-based Trade Standards</p> <p>1.2.3e. Three drones deployed and supporting proactive veterinary disease management that reduce risks associated with climate change.</p>

	need to be aware and able to access information on regulatory checks based on climate situations that drive disease risk).	1.2.3e. Pilot drone-based delivery of vaccines/veterinary medicines	
Output 1.3. New rangeland management curricula developed and operationalised to expand skills for restoration and regenerative grazing			
Activity 1.3.1. Create and monitor deployment of a new national curriculum for climate-resilient livestock herding to build adaptive capacity at the individual and community level.	BUAN CICE Trainers (in at Min of Agric Training Facilities in each District and Meat Inspection Training Centre in Lobatse) and regional experts will develop and register a new professional certificate programme for on key skills and topics for climate resilient livestock management. The programme design will assess individual climate vulnerability at the beginning of each employment session and assess change in personal and community adaptive capacity as a result of the programme.	1.3.1a. Development of the curriculum and training programme for professional herding and rangeland rehabilitation work 1.3.1b. Independent evaluation of training delivery in years 4&7	1.3.1a1. MOU between Botswana University of Agriculture and Natural Resources-Centre for In-service and Continued Education (BUANCICE) and MoA with regards to the curriculum development and training programme delivery 1.3.1a2. A network of expert collaborators secured and participating in the development of the curriculum 1.3.1a3. Ecoranger curriculum developed 1.3.1b. Independent evaluation reports on climate-resilient skills and the change in adaptive capacity of employed individuals
Output 1.4. New rangeland monitoring system is operationalised, embedded, and utilized in market, carbon monitoring, and policy systems			
Activity 1.4.1. Establish a Rangeland Stewardship Information Portal	Create and implement a new information portal system that is simple, relevant, and cost-effective. The system will be linked to Department of		1.4.1a. A representative, gender equitable task team designing and promoting an integrated monitoring system

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	<p>Meteorological Services (MET's) early warning system, wildlife monitoring systems, DPLG Drought Assessment system, Ipelegeng Wage Accounts, and StatsBotswana. It will also house monthly monitoring data from Ecorangers. Users will be trained to access and utilise the system at Farmer Facilitator team, VDC, district, and national levels for decision making. It will look to link existing web-based apps to a central report-generating database technology that is housed in the cloud and accessible to all departments requiring and/or inputting information. Visualisation of the data will be on Tableau or similar existing systems as well as integrated into participatory monitoring systems.¹⁷⁵ The development of the system will learn from similar systems deployed in Botswana's Statistics, Education and Health sectors recently.</p>	<p>1.4.1a. Set up a Task Team to develop desired system map for information sharing (who needs what information when, what is available already, what will be gathered, how frequently, verification methods, etc.)</p> <p>1.4.1b. Construct a database and associated web-based app systems linked via app</p> <p>1.4.1c. Local and national user workshops on Rangeland Stewardship Information Portal to capture recommendations for improvement</p> <p>1.4.1d. Integrate modifications based on user feedback annually and in final system improvement in year 5</p>	<p>1.4.1b,c,d. A user-friendly Rangeland Stewardship Information Portal that can facilitate inter-ministerial monitoring of land use, livestock management, job creation, and income returns</p> <p>1.4.1d. Revised/updated Rangeland Stewardship Information Portal for ongoing monitoring of implementation, climate-change environmental impacts, GHG emissions, and economic impacts.</p>
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¹⁷⁵ See Monitoring and Evaluation Plan for more details.

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	<p>Remote sensing data for Botswana will be used for change monitoring and linked to new Italian-funded weather stations.</p>		
<p>Activity 1.4.2. Train and support staff , farmers, and relevant officials to enable access to the Rangeland Stewardship Information Portal for improved decision-making and EbA planning and ensuring sustainable reduction in emissions</p>	<p>Ensure relevant parties (farmer facilitators, department officials, etc) understand the Rangeland Stewardship Portal, where to go to get access, and are supported to use it to strengthen their adaptive capacity to climate risks.</p>	<p>1.4.2a. Train 460 local officials and 40 national officials on use of the Rangeland Stewardship Information Portal systems.</p> <p>1.4.2b. Ensure staff capacity is in place at the local level: three regional coordinators (hosted by the District Agric Coord / DFRR offices in year 2) who facilitate ongoing training of incoming Ecorangers, farmers, VDC representative staff</p> <p>1.4.2c. Develop and implement a user-specific annual report system for distribution to each VDC grazing area, farmers associations, and relevant authorities</p> <p>1.4.2d. Lessons learned workshop and updating the system in years 3, 5, & 7</p>	<p>1.4.2a. Information access (infrastructure and IT support) exists for implementing monitoring of land use, livestock management, job creation, and income returns for each VDC</p> <p>1.4.2b&c. Relevant officials and all Ecorangers and Restoration Team leaders understand and know how to access information portal</p> <p>1.4.2d. Annual VDC Level Reports that provide information on climate, livestock condition, and rangeland health monitoring, and market access statistics from stewardship implementation practices</p> <p>1.4.2e. Workshop proceedings on monitoring lessons learned and system modification recommendations integrated into revised/updated Rangeland Stewardship Information Portal</p>

Output 1.5. Improved government policy initiatives on climate change actions and needs, enabling adaptive management			
<p>Activity 1.5.1. Promote the Project EbA and emissions reduction approach and lessons learned to key decision-making forums</p>	<p>National policies and programmes related to climate resilient communal rangelands management and low-carbon livestock production strategies are designed to understand the impact of livestock-based value chains that are enabled through new rangeland stewardship investments.</p>	<p>1.5.1a. Develop and implement a Project communications strategy which targets key decision-makers</p> <p>1.5.1b. Support Ministry of Agricultural on ROI Analysis of communal livestock contribution to agriculture-related GDP</p> <p>1.5.1c. Support Ministry of Agriculture and Ministry of Environment on GHG Inventory to include emissions calculations</p> <p>1.5.1d. Catalyse GDSA and SADC climate-resilient livestock production forums to share Botswana experience, including policy dialogue for integration of Project lessons into policy and legislation</p>	<p>1.5.1a. Project communications strategy and key decision makers aware of climate risks and EbA opportunities and impacts stemming from the Project</p> <p>1.5.1b. Annual Project ROI analysis on Ecorangers/Restoration Worker investments relative to livelihood/income improvement from sales and supporting enterprises starting in year 3.</p> <p>1.5.1c. Training workshop proceedings and Project report on GHG emissions inventory in years 5&8</p> <p>1.5.1d. GDSA and SADC climate resilient livestock production forums catalysed and hosted during events organised by these entities in years 2,4,6, & 8</p> <p>1.5.1d(2). At least three policy briefs developed for/from these forums, one of which will focus on gender and climate resilient development lessons from the Project.</p>

Component 2: Reducing GHG emissions and negative livelihood impacts through new job deployment in rangeland rehabilitation, improved livestock management, and climate impact monitoring.

Output 2.1. Job creation and social safety net programmes resourced by the Government are used to deploy restoration teams for climate-resilient land and livestock management in target Project Areas.

<p>Activity 2.1.1 Implement inclusive and gender-equitable recruitment, deployment, and in-service Training of Ecorangers, Restoration Worker Teams, and Graduate Monitors as part of Rangeland Stewardship.</p>	<p>Based on standard recruitment criteria for Ipelegeng Rangeland Stewardship Ecoranger and Restoration Worker positions, recruitment process will be facilitated with farmers, VDCs, and the broader community. Farmers committee will be involved in final Ecoranger testing and selection for their area and will sign an endorsement form that explains their rights and grievance mechanism procedures for reporting any issues. Training and field work assignments take place during employment periods and submitted via Min of Agric WIFI hubs. Competency assessed by accredited training service providers and mentor farmers at appropriate qualification levels.</p>	<p>2.1.1a. Ecoranger, Restoration Worker recruitment, farmer endorsement, and inception meetings at demonstration sites in years 1&2; expand to priority sites in years 3-5; amplify to all sites in clusters years 6-8</p> <p>2.1.1b. Train 5,500 Ecorangers and Restoration Workers during non-growing season with short course delivery in district training centres</p>	<p>2.1.1a. At least 5,500 Ipelegeng Ecorangers and Rangeland Restoration Workers are recruited, trained, employed, and managed to implement Rangeland Stewardship Agreements and collect data on ecological impacts of village-level grazing plans in Project Target Areas</p> <p>2.1.1.b At least 5,500 individuals have self-assessed improved adaptive capacity through enhanced professional skills, and future employability</p>
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<p>Activity 2.1.2. Create and deploy Graduate Monitors to measure compliance and impacts and support Rangeland Stewardship Information Portal and BAITs data management and use for enhancing local emissions mitigation and adaptive management capacity.</p>	<p>Five hundred government supported graduate monitors participating in internships and studies across the nine Project area clusters. Department of Animal Production, Dept of Range, Forestry and Fisheries, BUAN Natural Resource Management, Okavango Research Institute, and network of supporting NGOs as well as Project team will host graduate monitors and provide mentorship and oversight during the Project</p>	<p>2.1.2a. Graduate internship programme designed in year 2 and deployed in years 3-8</p>	<p>2.1.2a1. Five hundred graduates with enhanced knowledge of climate resilience and emissions reduction methods; and increased adaptive capacity from new employment and future employability</p> <p>2.1.2a2. Independent evaluation reports on climate-resilient skills and the change in adaptive capacity of employed individuals (as part of 2.1.1c.)</p>
<p>Output 2.2. Rehabilitation of ecosystems and improved management of land, soil, and livestock implemented and monitored to increase ecosystem productivity, reduce vulnerability of beneficiary populations, and reduce GHG emissions on 4.6 million hectares of climate-vulnerable communal rangelands.</p>			
<p>Activity 2.2.1 Complete baseline ecological and social assessments according to ESMP and GAP recommendations and international best practice.</p>	<p>Farmer facilitation teams will work together with rangeland science and gender specialist support to develop baseline assessment, and a three-year grazing plan to reduce climate vulnerability for the communities and their environments.</p>	<p>2.2.1a. Grazing area and community vulnerability baseline assessments are included as annexures to Rangeland Stewardship Agreements</p>	<p>2.2.1a. 104 VDC Grazing Area Baseline Assessments completed and stored in Rangeland Stewardship Information Portal and as VDC Rangeland Stewardship Agreement Annexures</p>

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<p>Activity 2.2.2. Implement community-based climate-resilient planned grazing, restoration, water and soil, and fire management in 104 VDC grazing land target sites</p>	<p>Implement a transformational programme that supports climate adaptation goals by enabling collective grazing on communal land managed by Ipelegeng employed professional herders called Ecorangers, and Rangeland Restoration Teams that will be engaged in bush thinning, erosion management, seed collection, and other soil, vegetation, freshwater system regeneration, as well as fire-break activities. Communities where Project operates will also receive community-based fire management and early -warning climate systems. Tailor-made “Grazing support packages” will be provided per Village Grazing Area that has a signed Rangeland Stewardship Agreement²⁵⁶</p>	<p>2.2.2a. Procurement and provision of “climate-resilient grazing support packages” including village hubs and gender equitable training and beneficitation at nine Project Demonstrations in years 1 & 2, within 104 VDCs in years 3-8</p> <p>2.2.2b. Implementation of community-based climate-resilient grazing, rangeland restoration, water and soil, and fire management in all VDC lands in Project areas</p> <p>2.2.2c. Facilitate farmer/community “how is it going?” monthly meetings at demonstration sites in years 1&2; expand to quarterly meetings at priority sites 3-5; amplify to all sites in clusters years 6-8</p>	<p>2.2.2a1. Nine “grazing support packages” disbursed and monitored for use in demonstration sites in years 1&2 according to operational best practice</p> <p>2.2.2a2. 104 locally appropriate (based on lessons from demos) grazing support packages disbursed over years 2-8 according to operational best practice</p> <p>2.2.2b. Climate resilient livestock production and restoration implemented on 4.6 million ha of grazing lands achieving reduction in emissions and negative livelihood impacts for 140,000 beneficiaries</p> <p>2.2.2c. Rangeland Stewardship and Climate Resilient Livestock Production Community Diaries as a Participatory Documentation of Project implementation for all participating 104 communal grazing areas</p>
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²⁵⁶ Support package design includes Ecorangers’ equipment, monitoring tools, climate resilient grazing plan, Rangeland Stewardship Agreement template, implementation support packages based on negotiated support packages.

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<p>Activity 2.2.3 Monitor and analyse changes in ecosystem health and livestock emissions for adaptive management and emissions reduction reporting.</p>	<p>Working with a small but dedicated Technical Advisory Group of local, national and global M&E experts, an Impact Monitoring System for measuring key GCF Fund indicators of GHG emissions reduction; increased resilience of vulnerable people; and increased resilience of ecosystems will be established. Ecorangers, mentor farmers, and graduate monitors will be involved in data collection, analysis, and integration of the results into future curriculum training events. Also, the team will be responsible for ensuring feedback of analysis into community review as per Output 1.3.</p>	<p>2.2.3.a Implementation of monitoring systems for land and livestock impacts on Project and control sites across the Project areas that feeds into the Rangeland Stewardship Information Portal</p> <p>2.2.3.b Annual analysis reports on adaptation impacts and emissions reduction</p>	<p>2.2.3.a Comprehensive and accurate monitoring system informing adaptive management and reporting.</p> <p>2.2.3.b Annual analysis reports, and at least 2 peer-reviewed publications on Botswana communal rangeland restoration</p>
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Component 3: Promoting climate-sensitive enterprise development and value-chain investments to sustain transformational change

Output 3.1. Market readiness trainings, enterprise development support, supply chain facilitation, local fund development build the enabling conditions for improved low-emission livestock value chains and climate resilient rural economies.

<p>Activity 3.1.1. Facilitate new income generation, savings opportunities, and local level funds especially from innovative CBT for livestock purchase from communal farmers active in Rangeland Stewardship Agreements for long-term resilience and sustainability.</p>	<p>Project team will work with Meat Naturally and other private sector partners to develop value chain opportunities and local level funds for Project participants/beneficiaries to participate in formal markets</p>	<p>3.1.1a. Market readiness and financial literacy training for 15,000 farmers (6000 women, 9000 men) and 6,000 Ecorangers, Restoration Workers and Graduate Monitors (3,600 women and 2,400 men)</p> <p>3.1.1b. Cluster-level business plans that create value-chains that sustain long-term climate-resilient livestock production</p> <p>3.1.1c. Facilitate access to markets/other incentives via H4H Enterprise Partners, such as Meat Naturally Botswana, and/or other relevant climate conscious enterprises, as part of the Project sustainability strategy for long-term rangeland management</p> <p>3.1.1d Facilitate new/existing local level funds to be used for sustaining project interventions, particularly Ecoranger salaries</p>	<p>3.1.1.a . At least 42,000 people in the target communities benefiting from additional income from livelihood strategies that contribute to and sustain climate-resilient regional economies</p> <p>3.1.1.b. Nine business plan/sustainability strategies (Ngamiland-4; Kgalagadi-3; Bobirwa-2) designed with local level private sector actors</p> <p>3.1.1c. Sales Reports (e.g. from BAITS, Meat Naturally, other abattoirs) integrated into Project M&E</p> <p>3.1.1d New/existing local level funds (e.g Herder's Funds/Community Trusts) for sustaining project interventions, particularly Ecoranger salaries exist for 80% of the Village Grazing Areas</p>
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<p>Activity 3.1.2. Build and improve understanding of regional economic resilience from expanding participation in business initiatives which enable, complement or are based on climate-resilient livestock production and associated financial flows.</p>	<p>Train interested men and women in Project Areas in complementary fodder production, fire management, veterinary supplies, equipment and uniform maintenance, WIFI hub management, and livestock product-related enterprises, including methane-reduction practices.</p> <p>Work with StatsBotswana to measure additional regional economic resilience beneficiaries resulting from new income resilience to climate shocks.</p>	<p>3.1.2a. Identify site-specific complementary sustainable initiatives and enterprises based on viability criteria established with Local Entrepreneurship Authority</p> <p>3.1.2b. Train and build the capacity of 17,000 (10,200 women, and 6,800 men) in target communities on complementary initiatives identified with Local Economic Agency (LEA and Citizen Enterprise Development Agency (CEDA)</p> <p>3.1.2c. Provision of core business/market readiness skills in all regions with LEA and facilitate linkages with CEDA and other funder investments</p> <p>3.1.2d Regional resilience to climate shocks at the Project Area level exists and is measurable.</p>	<p>3.1.2a. Site specific value chain development plans for VDC grazing areas</p> <p>3.1.2b. At least 34,000 people in the target communities benefiting from additional income from livelihood strategies that contribute to and sustain climate-resilient regional economies</p> <p>3.1.2c. Number and change in quality of applications to CEDA</p> <p>3.1.2d At least 151,000 people benefiting from more resilient economic activity in the Project Areas.</p>
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Output 3.2.: Selected financiers and value-chain players are aware and supported to incentivise rangeland stewardship and adopt carbon-optimisation practices and technologies

<p>Activity 3.2.1. Design, implement, and measure impact of an awareness campaign on climate-change, low-emissions productions, and Rangeland Stewardship production with broader red-meat value chain, including consumers</p>	<p>Aimed at generating public and private sector interest in inclusive, low-emissions red meat production from farmers in Rangeland Stewardship Agreements</p>	<p>3.2.1a. Identify, procure, and train local communications /marketing partners to work with RARE in year 2</p> <p>3.2.1b. Implement targeted awareness campaign through multi-media channels in a way that allows for tracking impact</p> <p>3.2.1c. Design and implement baseline, mid-term, and final assessment for key segments of the broader red-meat value chain</p>	<p>3.2.1a Communications materials on climate-resilient beef and rangeland stewardship (videos, information platforms, etc) present in all high-population Districts and in Gaborone.</p> <p>3.2.1b Support channels for sustainability of project interventions resulting from enhanced awareness identified, developed, and measured</p> <p>3.2.1c Impact assessments conducted in Year 4 and 7.</p>
<p>Activity 3.2.2. Develop and embed rangeland stewardship within climate-resilient livestock production and financing protocol for the industry</p>	<p>The Project will contract a consultant team to engage Botswana Meat Commission, CEDA, and other key market players to produce a report on the threats and opportunities related to “climate-resilience” within the broader Botswana red meat value chain. The report will be shared with relevant private-sector stakeholders via a launch workshop and</p>	<p>3.2.2.a. Develop a climate-resilience status and investment needs report for the Botswana red-meat value chain</p> <p>3.2.2b. Host policy-implementation dialogues on development of climate resilient livestock, wildlife-friendly production that enables and complies with CBT standards</p>	<p>3.2.2a. Climate-proofing Botswana’s Red Meat Value Chain Report on mitigation impact and potential climate policy and finance opportunities submitted to key policy and industry stakeholders</p> <p>3.2.2b. Climate-resilient livestock production protocols developed and embedded in key beef sector development strategies (e.g Botswana Commodity-based Trade Protocols; National Grassfed Beef Strategy)</p>

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	<p>follow up meetings with key government stakeholders. Using the report, lessons learned, and examples of improved management, the Project will engage key players to shift production and financing protocols towards regenerative and low-carbon emissions. The goal of this activity is to ensure Project beneficiaries have sustainable market access as well as expand co-financed mitigation opportunities from the Project. The potential for value-add certification of market segmentation from “climate-friendly meat” as well as innovative carbon-financing strategies will be explored.</p>	<p>with BMC and other key market players</p> <p>3.2.2c. Embed climate-resilient criteria in CEDA representative staff training, investment decision-making processes, and financing strategies</p>	<p>3.2.2c. 100% of CEDA investments in livestock production are compliant with new climate-resilience criteria</p>
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F. RISK ASSESSMENT AND MANAGEMENT

F.1. Risk factors and mitigations measures

Selected Risk Factor 1: Land use conflicts/competition

Category	Probability	Impact
Technical and operational	High	Medium

Description

Land use that undermines that the rest or rehabilitation of areas within a Rangeland Stewardship Agreement is the top risk to Project goals. This risk is greatest in areas targeted for privatisation under the recent revision of the Tribal Grazing Land Policy (2019) and in areas that are proximal to private or group ranches where communal lands are used by both communities and private landowners. This issue was discussed at length in the PPF stakeholder consultations and there was a diversity of opinions on its impact on the project success ranging from no impact to it likely prohibiting the communal stewardship success. Pre-existing conflicts with neighbours and/or Land Boards or Traditional authorities over grazing land rights also present a challenge for the Project to overcome. The presence of such conflicts was mentioned regularly, but not universally across the Project areas and reflect a context addressed successfully in the past in other Herding for Health efforts through open dialogue and engagement with both communal and private livestock farmers.

Mitigation Measure(s)

Due to historical memory of collective grazing benefits, the barriers to integrated management, as long as individual farmer benefits are supported, can be overcome during the negotiation of the Rangeland Stewardship Agreement. The Project team will use the negotiation process to reduce risk of land-use conflict and identify potential mitigation measures to be implemented on a case-by-case basis. Geography, availability of labour, mobile fencing, or opportunities for integrating collective herd management with community neighbours and private landholders within an area will be evaluated with ecological/regenerative grazing specialists and the DFRR, and built into the grazing management plans. Project demonstration sites have been selected in areas where such conflicts are non-existent or low and case studies from South Africa of successes and failures relating to community dynamics will be shared with the Farmer Facilitation Teams during the Training of Trainers. Rare training is also deeply rooted in conflict resolution and behaviour change science and they have been selected for the mentorship role for the project because of this experience.

The training and involvement of Land Board representatives, traditional authorities, and VDCs on principles of climate smart rangeland management and implications for land-use plans will be continuously emphasized in all engagements. Neighbouring private farmers would be invited to participate in training in Activity 1.2 and 1.3 and encouraged to engage in a broader landscape agreement for maximum resilience and may be identified to play a role as "mentor farmers" for training Ecorangers that will result in mutual benefits and a 'fair deal'. Where additional incentives are required to ensure equal participation in the Rangeland Stewardship Agreement, the Project will work with value-chain players and government to mobilise appropriate measures that maintain equity. It is unlikely that all Project areas will face this risk at the same time and as such, lessons and strategies developed over time will reduce both the probability and the impact over the life of the Project and beyond.

The aim of the RSA is to spatially define the limits for grazing to minimize conflict with wildlife. Annual re-negotiations allow the Project to adjust grazing or land management conflicts that are identified during implementation. During proposal development, CI hosted four zoom-based meetings with wildlife and livestock specialists to discuss principles for RSAs and identify migration routes/habitat sensitivities or seasonal movements that should be avoided within any grazing agreement. These discussions proved to be very useful for both sides of the historically conflicting interests (conservation vs livestock producer) and have shown many areas for potential solutions to reduce conflict including night kraaling and the use of scents to reduce predator interest in livestock areas.

Customary law courts (traditional law courts) may be used as a final resort by a Village Development Committee or Land Board in the case that a land use conflict cannot be prevented or resolved through Project interventions. In some dispute cases the local headman or chief (Kgosi) may be able to assist before the relevant clauses of the Tribal Land Act (2018) are utilized. This would be based on the historical involvement of tribal authorities and land overseers in mitigation and conflict resolution at local community level regarding matters of communal grazing. In such situations, CI would help vulnerable communities to understand the legal process and their rights and may present technical evidence where required/requested in the process.

Selected Risk Factor 2: Perverse / counterproductive market incentives

Category	Probability	Impact
Other	Medium	Medium

Description

Traditional relationships with the Botswana Meat Commission and livestock market middlemen could undermine incentives for smallholders to adopt climate resilient rangeland stewardship practices. Historically, the Botswana Meat Commission (BMC) has offered prices that enable farmers who do not practice good animal husbandry practices to receive almost the same payment for an animal as someone who invests in better livestock management practices (i.e., paying for a herder, vaccines, dips, supplemental fodder in times of vegetation stress, etc). While the intention behind the current pricing policy is to promote equitable access, it has led to the situation of large numbers of unmanaged animals that cause environmental degradation and disease outbreaks that increase climate vulnerability in the target areas. The state of the BMC and future pricing policies are unknown at the moment. Middlemen or speculators are also active in some communities in the Project areas. Should they offer higher prices to communal farmers not participating in the Project, this could reduce incentives resulting in lower participation in the Project activities.

Mitigation Measure(s)

The Project will work closely with partner Meat Naturally Botswana (MNP) and other private sector actors to encourage price-based incentives that harness current value-chain player purchase power or offer better market access alternatives. For example, MNP will seek to support BMC by making better payment terms and/or help speculators meet their targets at a lower cost by hosting an auction for communities in Rangeland Stewardship Agreements. BMC is supportive of these activities to increase the available quality and supply of climate smart cattle products. See the Feasibility Study for specific MNP approaches that will be used to reduce this risk. This risk is likely to be higher at the beginning of the Project but will lower as demonstration sites begin to show higher returns from improved market access activities.

Selected Risk Factor 3: Institutional and regulatory barriers to integrated and adaptive management

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

Current government policy and subsidy / incentive programmes for the livestock sector may reduce effectiveness or work against the objectives of the programme i.e., veterinary fencing, disease control measures, or livestock procurement schemes. Reforms to government programmes are under discussion but may cause confusion and changed institutional relationships that could slow implementation (please see paragraph 243).

Similarly, local government changes and changes in coordination mandates that evolve after the 2019 election may also slow implementation until new local government cross-sectoral communication and coordination protocols are established. It is important to note that the Project will also be susceptible to additional uncertainty and delays related to a National General Election scheduled for 2024. Co-financing commitments by the Government could also be a risk to project success, as project activities include the training and participation of Ecorangers and Restoration workers, whose salaries will be paid by the Government. Elections and change in government structures could also

affect co-financing after the 2024 general elections, which in Project budget terms, would mean that currently committed co-finance could be adjusted after the 2024/25 financial year under a new administration's mandate. Non materialization of co-finance will have direct impacts on the implementation of this Project. If co-finance is not provided, the scale, scope, and targets of the Project will need to be adjusted accordingly. Co-finance makes up the majority of the overall Project budget, and non-materialization will require proportional reduction in the number of sites targeted by the Project to compensate for reduced numbers of Ecorangers, Graduate Monitors, and Restoration workers engaged by the project. Reduction in these *Ipelegeng* employees and number of Village Grazing Areas targeted by the Project will result in a proportional reduction in the Project's adaptation and mitigation targets.

The Project success also depends on active and equal partnerships between government, NGOs, farmers and the private sector. Due to the long history of working independently, competing for financial resources, and varying power dynamics, these entities may find it cumbersome to establish working relationships and collaborate in a way that is mutually beneficial. Individual scepticism or lack of interest in the Project by a key institution can inhibit progress. This risk will be particularly high in the beginning of the Project and as the Project experiences challenges which can lead to organisations retreating into comfort zones, disengaging, or failing to play their role.²⁵⁷

Mitigation

The Project will focus and invest in coordination, policy alignment, and budgetary processes as key priorities for maintaining the current favourable regulatory environment. Activities under Output 1.4 and Output 3.2 will help to engage the highest-level decision makers and the broader public as witnesses to Project impacts and contributions to Botswana's development, economy, and aspirations as a niche meat exporter. The Rare sub-grant, effectiveness of communications activities, and the impact of this coordination effort will be assessed throughout implementation and during the Project mid-term review. As a result of the dedicated effort to work on process, the probability for counterproductive or siloed efforts will be minimised and the incentives to collaborate increased.

The proposed inclusive structure of the PSC and component sub-committees will also directly lead to cooperation and communication between government ministries, departments, and stakeholders at all levels. By holding proposed meetings, workshops, and dialogues from the national to local level, the project will ensure that all stakeholders are informed about Project progress and can address issues or concerns as they arise. Please see paragraph 194 for elaboration on Project approaches to reducing risk from the regulatory environment.

The Project intentionally included Ecoranger and Restoration Worker salaries as the project co-finance due to the continuous nature of this work-support government program as a budget priority in Botswana across several administration transitions. Even if the overall allocation for *Ipelegeng* decreases, it is hoped that any reduction in co-finance will be minimised through the Project's delivery of value-add (training and equipment in Component 2) to the government's job creation investment, incentivizing the continuation of support for Ecorangers, Restoration Workers, and Graduate Monitors. Further, CI-Botswana as the EE will make its best efforts to coordinate with the Government on an ongoing basis to assure co-financing is materialized as described in the Project Budget, including through periodic financial reporting on co-finance.

Selected Risk Factor 4: Natural rangeland ecosystem dynamics prevent recovery

Category	Probability	Impact
Technical and operational	Medium	Medium

Description

As climate impacts increase over time in Botswana, any area of recovery and/or new water sources are likely to attract wildlife resulting in an increased grazing pressure that could reduce the positive effects of the Project. Where communal land is proximal to wildlife management areas, it may be determined that the project approach is not feasible or appropriate, in which case alternative solutions such as tourism promotion may be a better adaptation solution. Wildfire, as another natural rangeland dynamic feature, can affect a particular rangeland stewardship plan for a period. It is anticipated that this risk and its impact will be localized and temporary in nature. However, persistent

²⁵⁷ Additional information on the policy and regulatory framework can be found in Annex 2, Section 4, Appendix 4.11

or severe droughts and fires can create additional rangeland degradation and/or situations in which additional active measures including drought-relief livestock feed will be required.

Mitigation

Ecoranger training will include management strategies for managing interactions and conflict between wildlife and livestock, and communal grazing plans will seek to minimize these interactions. Adaptive strategies will be developed to modify grazing plans and resource allocations to further reduce potential conflict with wildlife populations. Fire awareness and basic fire-fighting partnerships will be mobilized with DFRR in all high-risk areas. Additionally, the The Rangeland Stewardship Portal will provide data to policy makers and farmers which will allow for better decision-making to mitigate the impacts of these events. The Project will be realistic and take a practical approach to feasibility of activity success based on assessment for long-term market potential and if alternative adaptation approaches are better suited/more lucrative for a target grazing area, this will be communicated and support for other benefits from government or donor project will be facilitated by the Project.

In addition, the Project will utilize its close working relationship with the Ministry of Local Government to expedite and ensure drought relief gets to Project areas to limit elite capture of resources, which is occasionally experienced.

Selected Risk Factor 5: Project staffing and scale-up

Category	Probability	Impact
Technical and operational	Low	Medium

Description

Implementation of this Project will require CI Botswana to scale up its operations from a small current office to a fully staffed team ultimately totalling 83 employees by Phase III of the Project by ensuring that the phased approach to implementation and staffing is well supported.

There are risks that delayed recruitment, onboarding, and training of qualified Project staff may delay project activities or that the new staff experience team-building issues that impact project management and implementation.

Mitigation

To ensure the timely and effective implementation of the Project, including during the initial scaling-up phase, CI-Botswana will take several steps to mitigate risks associated with project staffing and scale-up.

The timeline for the first year of the Project is structured to allow for sufficient time for staff recruitment, onboarding, training, and capacity-building of new staff hired for the Project. Hiring will be done in phases: the hiring of key project staff members (including human resources staff, Chief of Party, and the Operations Director) will be prioritized; to this end, CI will use its own resources to begin recruitment for these positions prior to Project FAA effectiveness. Other hiring will proceed according to project priorities and defined timelines. It is expected that, as a result of training from prior projects and extensive livestock farming experience in the country, there will be a significant pool of qualified local candidates in Botswana. CI will use a transparent and well-publicised open recruitment process to fill all positions.

CI will also create mechanisms for sharing the significant existing expertise and experience from across the organization with new project staff, especially in Years 1 and 2. This will include training, capacity building, and knowledge sharing from current CI Botswana staff; CI's regional and global operations and technical staff, and CI's Global Field Project Support team. The Project will also undertake robust training for operations staff to accommodate the scaling up of activities on the ground that will address recruitment, administrative and financial functions, procurement, and grants / contract management.

Specifically, Project staff will have counterparts in the CI South Africa Programme as well as Herding for Health Projects in Mozambique and Zambia. Technical and operations support will also be provided by the CI Botswana Country Director and GDSA Executive Secretary, the CI Africa Field Division Herding for Health Director, Climate Change Director, and leads on Gender, Community-Based Natural Resource Management / Conservation Agreements, Grants Management, M&E Specialists, and the Conservation Finance Director. These supporting staff have experience with project management and with the implementation of the Herding for Health model. The Herding for Health Director, who worked on the AHEAD project, is currently supporting the two demonstration site projects in Ngamiland as well as developing a feasibility assessment for implementation at the Greater Mapungubwe TFCA, which includes the Bobirwa region focal area for this Project. The Herding for Health Director will be employed by the Project as key personnel and will support recruitment and team building.

Finally, CI will create a dedicated start-up team which will include key Project personnel, CI's Africa Field Division, and CI's Field Project Support team who will apply their experience with the management of other large projects - including a multi-year, multi-partner GCF project in Madagascar. This project start-up team will be supported by the CI-GCF Agency (Project AE) which will provide oversight and guidance. In addition to leading start-up, the team will support the creation of an effective and efficient detailed implementation workplan for Phase 1 of the Project to keep project execution on schedule.

Selected Risk Factor 6: Prohibited Practices, including ML/FT

Category	Probability	Impact
Prohibited practices	Low	Medium

Description

The Project involves a wide array of actors, including government, sub-grantees, vendors and service providers, and beneficiaries. However, based on a calculation using multiple international risk indicators, CI assesses Botswana to be a relatively low-risk country for prohibited practices, including terrorist financing and money laundering. CI, as EE, follows all CI policies and procedures concerning AML/CFT, and the project's major recipients of GCF funds, sub-grantees Rare and BUAN, were screened and cleared against international sanctions lists. In addition, CI has strong AML/CFT procedures and prohibited practices training and procedures in place to prevent and mitigate risk. Concerning impact, serious breaches in prohibited practices, including ML/FT, would impact the reputation of CI and the Project.

Mitigation

CI has several procedures and controls in place to prevent, mitigate, and identify risk. In order to comply with CI AML/CTF, U.S. law, and GCF fiduciary standards, CI applies rigorous CTF/AML screening to all CI funding recipients. CI also conducts an assessment of Prohibited Practices (PP) risks of grant recipients and includes any required mitigation measures in its legally binding grant agreements. All staff and subgrantees must also undergo training on PP (including red flags and how to report violations), and all grant and services agreements (used by both CI and sub-grantees) must include language on compliance with the GCF Policy on Prohibited Practices. Compliance with PP policies and mitigation measures is part of project monitoring, including site visits and CI internal audits, throughout implementation.

To report and remedy risks, any CI employee; employee of an executing entity, grantee, partner, or vendor; or beneficiary may report a grievance or violation of these policies anonymously online or by telephone through CI's Ethics Hotline. All reported grievances will be investigated and addressed per CI's Anti-Fraud Policy & Guidelines for Investigations. Full details can be found on CI's website at <https://www.conservation.org/about/our-policies/reporting-illegal-or-unethical-conduct-statement>.

G. GCF POLICIES AND STANDARDS

G.1. Environmental and social risk assessment

265. The Project is being proposed as Category B or “moderate risk” according to the GCF Project classification. This is because the Project has the potential for limited adverse environmental or social risks and impacts that are few, generally site-specific, largely reversible, and readily addressed through mitigation measures. Justification for this is provided in the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) in Annex 6 of the Funding Proposal. The main risks anticipated are summarised below along with mitigation measures to address them.

Table 19: Summary of risks and mitigation measures.

Summary of risks	Mitigation factors / measures and management strategies
Environmental	
<p>Protection of natural habitats: A lack of buy-in from pastoralists of Project interventions, may consequently disrupt Project delivery and lead to a perpetuation of unsustainable practices. Additionally, as the Project will bring large numbers of livestock under collective management, it will require shared commitment from pastoralists to comply with national legislation and international standards regarding issues such as waste and pollution management.</p>	<p>Mitigation measures to address this risk include: i) participatory stakeholder mapping; ii) developing guidelines in a participatory manner to reflect the principles of inclusive participation and FPIC; iii) ensuring that Village Development Committees (VDCs) are representative of beneficiary communities; and iv) facilitating inter-VDC collaboration. Additionally, a risk analysis undertaken using a stakeholder participatory approach — to ensure buy-in of pastoralists — will identify what stakeholders already know about possible risks, as well identify the people most vulnerable to increased risk of harm.</p>
Social	
<p>Involuntary resettlement: The Project’s requirement for participation of land users in target locations may trigger restrictions of access, where cattle owners outside their locality have already migrated onto other people’s grazing areas. Previously, local communities have attempted to restrict such uncoordinated migration of cattle posts because of scarce rangeland resources made even scarcer by prolonged drought and disease control fences.</p>	<p>To mitigate this risk, the Project includes training and support to enhance the capacity of land authorities to ensure sustainable land and livestock management. Community training is designed similarly to facilitate change in attitudes and behaviours towards sustainable, collective resource use and management. An additional measure will be to carry out baseline stakeholder mapping to provide information for better decision making and participatory planning.</p>
<p>Indigenous peoples: The environmental and social safeguard seeking to protect indigenous peoples is triggered by the Project design, as interventions target Basarwa communities. As there are some members of this indigenous community who live as herders at cattle posts owned by more populous ethnic groups, Basarwa communities are particularly vulnerable to exclusion and marginalisation.</p>	<p>An Indigenous Peoples’ Plan has been developed to mitigate against this risk. Participatory stakeholder mapping of indigenous people will be carried out to provide baseline information on spatial location of people, resources, demographic profiles, economic profiles, and relations to other communities and resources users. Additionally, Free, Prior and Informed Consent (FPIC) will be embedded in all Project training programmes, as well as the awareness of the human rights of minorities in training materials. Prior to work in areas with indigenous peoples, a full FPIC process will be</p>

	<p>implemented. To ensure the Project supports Basarwa communities specifically (in Kalagadi), the number of Ecorangers deployed will be proportionate to population of Basarwa (and other indigenous groups) in the targeted areas.</p>
<p>Labour and working conditions: There are risks related to the commitment of gender parity in employment creation as a result of the Project. As pastoralism is currently a male-dominated livelihood in Botswana, there is also the risk of sexual harassment at work, the threat of which is compounded by the fact that sexual harassment is not expressly prohibited by Botswana law. Additionally, there is the risk of women and children being exploited as free labour.</p>	<p>Mitigation measures to address these risks include: i) developing a baseline assessment to determine the prevalence, nature and causes of labour and gender equity issues with a view to identifying the most effective ways of eliminating harmful practices; ii) the incorporation of prohibitions into conservation agreements, training materials, human resource policies and codes of ethics; iii) embedding penalty clauses for non-compliance with employment standards in the conduct of business, code of ethics and training materials; iv) explicitly prohibiting sexual harassment and gender violence in the code of ethics; and v) sensitising value-chain stakeholders to legal prohibitions. Additionally, <i>Ipelegeng's</i> general policies governing labour and working conditions will also apply. All project stakeholders, including women, will have access to the Project level grievance mechanism that will allow for anonymous submission of grievances.</p>
<p>Community, health, safety and security: The collective rotational grazing approach proposed for this Project will bring large numbers of animals to be corralled and grazed together on communal rangelands. There are, therefore, health, safety and security issues that will be particular to this form of land and livestock management system, which will require a robust and fit-for-purpose risk management plan that will be developed through participatory stakeholder engagement. Additionally, new risks from the spread of infectious diseases such as COVID is possible.</p>	<p>Health and Safety policies will be developed and shared with stakeholders. Health, safety and security service institutions will be brought on board in multi-stakeholder, cross-sectoral discussions and integrated planning for sustainable resource management with high standards of health, safety and security. The Health and Safety standards used by South Africa's Herding for Health Programme will be used as a foundation and tailored to incorporate local conditions and laws. Additionally, Ecorangers and Restoration Workers will have at least two members appointed as Health and Safety officers that receive level 2 first aid training. A code of practice for managing risk to public health, safety and security will also be developed, using a gender-equitable approach. A draft Emergency Response and Preparedness Plan has been drafted and included in the ESMP. This will be further developed and elaborated on during project inception. CI has developed guidelines for COVID prevention and response (Annex 06, Appendix B). These guidelines will be applied in accordance with new</p>

guidance from WHO, the government of Botswana and other authorities.²⁵⁸

266. Further details about the risks considered in the Conservation International risk screening process are provided in the Environmental and Social Management Plan (ESMP) in Annex 6. This plan shows how these risks have been considered in the fundamental design of the Project and any additional mitigation measures that may be required. In addition, given the processes to be carried out during Project implementation (drafting of stewardship agreements, etc), the specific nature of any other residual environmental and social risks that remain will be assessed as part of delivery.

267. Risks will be managed through the measures listed below:

- Involving an experienced environmental and social safeguards specialist throughout the Project planning, design and implementation processes.
- Establishing methodologies for the environmental and social assessment of each of the activities under the Project.
- Ensuring the monitoring and evaluation (M&E) process includes adequate review of environmental and social risks. This will be done by an M&E specialist with specific experience in reviewing environmental and social considerations.
- Assigning formal roles and responsibilities for environmental and social management across the Project team.
- Establishing a reporting procedure for environmental and social concerns related to the interventions, including through the project level grievance mechanism.
- Incorporating environmental and social safeguard considerations into the training, capacity building and technical assistance delivered through the Project.
- Ensuring environmental and social risks and safeguards are considered in documentation to be produced under the Project, including in stewardship agreements, training materials, human resource policies and codes of ethics.
- A robust grievance mechanism will be put in place for any project stakeholder to file grievances and have them addressed effectively by the Project.

268. The environmental and social management processes will draw upon the following documents:

²⁵⁸ <https://covid19portal.gov.bw/document-library>

- GCF Environmental and Social Management System;
- CI safeguards systems;
- CI Code of Ethics
- CI's Environmental and Social Management Framework (ESMF)
- CI Herding for Health rangeland stewardship agreements;
- Summaries of stakeholder consultations;
- Baselines of environmental and social conditions;
- Project ESIA and ESMP, including specific management frameworks and baselines such as the:
 - Stakeholder Engagement Plan;
 - Environmental management plan;
 - Indigenous People's Plan;
 - Labour and Working Conditions Risk Management Plan;
 - Involuntary Resettlement and Restriction of Access to Natural Resources Plan;
 - Community Health, Safety, and Security Management Plan; and
 - Policy, Legal and Administrative Framework;
- Project grievance mechanisms; and
- Project Gender Assessment and Action Plan.
- GCF Policies on prohibited practices, indigenous people's policy, and gender policy

G.2. Gender assessment and action plan (max. 500 words, approximately 1 page)

- 269.** During Project preparation, a gender assessment was undertaken to understand the differential vulnerability to, and impact of, climate change on women and men in Ngamiland, Bobirwa and Kgalagadi. From the findings of this assessment and an analysis of the proposed Project solution, a gender action plan (GAP) was developed. The process to produce these components included a desktop review and analysis of available literature and relevant legislation, policy and programmes in the country, as well as key informant interviews, household questionnaires, focus group discussions and consultation workshops with Project stakeholders and beneficiaries.
- 270.** The assessment describes the formal and customary legal policies and norms that govern men and women's roles, responsibility and activities. Although gender equality is upheld in national legislation and the formal judicial system, in compliance with international agreements, customary law, which applies mainly in the rural areas, is enforced by tribal structures and customary courts, which generally have fewer protections for women. For example, the Administration of Estate Act allows customary laws to govern inheritance of the estate, which has been shown to favour men at the expense of women. Moreover, although the Abolition of Marital Power Act (2004) repealed common law practices of patriarchal marital power and gave men and women equal rights within marriage, the Act does not apply to customary or religious marriages. Women married under customary law are considered legal

minors and require the permission of their spouse for household decisions and access to finance.

- 271.** In the Project areas, which consist of predominantly rural, pastoral households, women are more likely than men to be reliant upon remittances from family members, public employment schemes such as *Ipelegeng*, government poverty eradication programmes like food baskets, or government pensions. This can expose them to additional vulnerabilities if payments are delayed or withheld. The assessment also acknowledges gender-based violence, which is endemic in Botswana, as a possible risk to elements of Project implementation. Women may be at greater risk as a result of their physical exposure during Ecoranger activities or from intimate-partner violence as they become empowered in their households. The GAP includes measures to mitigate against these risks.
- 272.** As well as describing men and women's relative vulnerability and adaptation strategies to climate change, the gender assessment and problem analysis identified gendered risks and opportunities related to unequal: i) division of labour; ii) access to financial resources; iii) access to land; iv) livestock ownership v) access to water; vi) access to information and technology; and vii) decision-making roles and authority. In addition to gender norms in the household, particularly differing roles as caregivers, a critical factor affecting men and women's adaptive capacity to climate change is related to the gendered diversification of roles and livelihoods in the eco-agricultural landscape. These factors expose men and women to different dynamics of risk associated with climate hazards like droughts and floods. Although women may be exposed to diversified, ongoing risk, men have greater exposure to particularly severe climate events, since their livelihoods, income and wealth are generally concentrated in their cattle livestock.
- 273.** To mitigate against introducing gender biases amongst Project participants and beneficiaries during implementation and after Project completion, the Gender Action Plan outlines several interventions to ensure the Project does not unintentionally contribute to perpetuating or worsening gender inequality and gender-based climate vulnerability in Ngamiland, Bobirwa and Kgalagadi. The GAP identifies salient spheres for key gender issues in Project implementation, including: i) collective grazing practices and arrangements; ii) Ecoranger and Restoration Worker trainings; and iii) general gender and social norms, which includes a consideration of gender-based violence risk during Project activities. The plan seeks to promote gender equality by including actions and targets that will increase women's participation, representation and awareness, as well as ensuring that training programmes are gender-sensitive and inclusive, while acknowledging women's relatively lower baseline capacity for livestock management. It includes clear targets, sex-disaggregated data collection, gender-sensitive design features and quantifiable performance indicators to promote women's participation and benefits from the Project.
- 274.** Some of the actions of the GAP include:
- proactively promoting women's inclusion in all Project aspects, including training and gender-transformative employment opportunities;
 - pursuing representative participation in all consultations and workshop events, which will include providing childcare;

- producing gender sensitive Project materials, that are accessible to target beneficiaries;
 - supporting gender mainstreaming into processes and policies of government stakeholder departments;
 - advancing gender diversity and challenging negative stereotyping in public awareness activities;
 - designing and implementing gender-sensitive training that considers the different base knowledge levels, learning methods and training accessibility of men and women and,
 - ensuring that interventions does not exacerbate GBV by including partnered empowerment, working with husbands and male leaders to accompany women-oriented activities. The Grievance Reporting Mechanism will also specifically include considerations for capturing and responding to reports of GBV.
- 275.** CI will also employ a full-time Gender Officer who will be situated within the Project Management Unit, to oversee the implementation of the GAP, as well as provide inputs and conduct gender mainstreaming during Project implementation. The Gender Officer will be supported by CI's global Gender team. The full Gender Assessment and Project-level Gender Action Plan are included as FP Annex 8.

G.3. Financial management and procurement (max. 500 words, approximately 1 page)

- 276.** The Project will be executed by CI-Botswana, and therefore, financial management and procurement for this Project will follow relevant, established CI policies and procedures, as well as relevant provisions in the Accreditation Master Agreement (AMA) signed between CI and the GCF.

Financial management

- 277.** CI uses Unit 4 Business World software suite as its enterprise resource planning (ERP) system for financial accounting and monitoring in all its global operations. This system supports financial monitoring, reporting, human resources, procurement, and record-keeping in line with the requirements of CI's AMA. It supports a system of ledger accounts to separate and track income and expenditure by donor, project, and subaward. CI also provides a coding system and established procedures for monitoring and reporting of projects. In addition, the EE and sub-grantees will be required to submit quarterly financial reports that will be systematically reviewed by the AE and EE, respectively.
- 278.** An annual audit of the Project will be conducted by an independent external audit firm in accordance with audit standards under U.S. GAAP and furnished to the GCF in accordance with CI's AMA.
- 279.** Disbursements made to CI will be recorded to the ledger account for this GCF Project, which can be tracked using the Unit 4 Business World system. Disbursements from the EE to sub-grantees will be made upon CI's receipt of acceptable progress and financial reports and any other requirements as included in the applicable grant agreement.
- 280.** CI has procedures and controls in place to prevent risk of prohibited practices, including ML/FT (collectively, 'PP'). CI applies rigorous CTF/AML screening to all CI funding recipients. CI also assesses PP risks of grant recipients and includes mitigation measures in its grant

agreements. All CI staff and subgrantees must also undergo training on PP (including red flags and how to report violations), and all grant and services agreements (used by both CI and sub-grantees) must include language on compliance with the GCF Policy on Prohibited Practices. Compliance with PP policies and mitigation measures is part of project monitoring, including site visits and CI internal audits, throughout project implementation.

- 281.** Violations of PPs, fraud, or financial misuse may be reported anonymously online or by telephone through CI's Ethics Hotline. All reported grievances will be investigated and addressed per CI's Anti-Fraud Policy & Guidelines for Investigations.

Procurement

- 282.** All procurement for this project must follow the Procurement Process Standards as defined in the CI Procurement Policy, which requires that all procurements of goods or services ensure the best value and comply with all donor funding terms and conditions, and that all goods be used only for their intended purposes and consistent with CI's Code of Ethics and suite of anti-fraud policies. CI's procurement standards are in line with GCF fiduciary standards.

- 283.** All procurement done by CI will follow CI's internal procurement controls and risk-mitigation measures, including procurement planning, multi-level purchasing approvals (including AE approval over a set threshold), quarterly reporting on procurement & equipment, periodic inventories, and post-award reviews. CI's Grant and Contracts Unit must approve contracts of US\$20,000 or more awarded by CI's Botswana office, including for this Project.

- 284.** CI will assess the procurement policies of any subgrantee organization conducting procurement for this Project. Project sub-grantees that meet CI's Procurement Process Standards as defined in CI's Procurement Policy will use with their own procurement policy and procedures for the Project; otherwise, they will be required to use CI's Procurement Policy for the Project. Detailed procurement requirements consistent with CI and GCF standards will be included in the grant agreement signed between CI and the grantee organization.

- 285.** CI will apply mitigation measures and monitor all procurement for this Project to ensure that any procured goods are used only for their intended purposes. It will provide training on procurement and prohibited practices for CI staff and subgrantees and will approve annual procurement plans and all procurements over a set threshold. It will also conduct monitoring through quarterly reporting on procurement & equipment and through periodic site visits.

G.4. Disclosure of funding proposal

- No confidential information:** The accredited entity confirms that the funding proposal, including its annexes, may be disclosed in full by the GCF, as no information is being provided in confidence.
- With confidential information:** The accredited entity declares that the funding proposal, including its annexes, may not be disclosed in full by the GCF, as certain information is being provided in confidence. Accordingly, the accredited entity is providing to the Secretariat the following two copies of the funding proposal, including all annexes:

- X full copy for internal use of the GCF in which the confidential portions are marked accordingly, together with an explanatory note regarding the said portions and the corresponding reason for confidentiality under the accredited entity's disclosure policy, and
- X redacted copy for disclosure on the GCF website.

The funding proposal can only be processed upon receipt of the two copies above, if containing confidential information.

H. ANNEXES

H.1. Mandatory annexes

- Annex 1 NDA No-objection letter(s) **(template provided)**
- Annex 2 Feasibility study - and a market study, if applicable
- Annex 3 Economic and/or financial analyses in spreadsheet format
- Annex 4 Detailed budget plan **(template provided)**
- Annex 5 Implementation timetable including key Project/programme milestones **(template provided)**
- Annex 6 E&S document corresponding to the E&S category (A, B or C; or I1, I2 or I3):
(ESS disclosure template provided)
 - Environmental and Social Impact Assessment (ESIA) or
 - Environmental and Social Management Plan (ESMP) or
 - Environmental and Social Management System (ESMS)
 - x Others (please specify – e.g. Resettlement Action Plan, Resettlement Policy Framework, **Indigenous People's Plan**, Land Acquisition Plan, etc.)
- Annex 7 Summary of consultations and stakeholder engagement plan
- Annex 8 Gender assessment and Project/programme-level action plan **(template provided)**
- Annex 9 Legal due diligence (regulation, taxation and insurance)
- Annex 10 Procurement plan **(template provided)**
- Annex 11 Monitoring and evaluation plans **(template provided)**
- Annex 12 AE fee request **(template provided)**
- Annex 13 Co-financing commitment letter, if applicable **(template provided)**
- Annex 14 Term sheet including a detailed disbursement schedule and, if applicable, repayment schedule

H.2. Other annexes as applicable

- Annex 15 Evidence of internal approval **(template provided)**
- Annex 16 Map(s) indicating the location of proposed interventions
- Annex 17 Multi-country Project/programme information **(template provided)**
- Annex 18 Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot Project
- Annex 19 Procedures for controlling procurement by third parties or executing entities undertaking Projects financed by the entity
- Annex 20 First level AML/CFT (KYC) assessment
- Annex 21 Operations manual (Operations and maintenance)
- Annex 22 GHG Emissions Reductions Calculations and FP references

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*