



WATERQ2: UNDERSTANDING WATER QUALITY & QUANTITY IN THE LIMPOPO BASIN

Environmental Mitigation and Monitoring Plan

16 June 2019, version 2

DISCLAIMER: This work was supported by the United States Agency for International Development (USAID), Southern Africa Regional Mission, Fixed Amount Award 72067419FA00001. This work reflects the work of the authors and does not necessarily reflect the views of USAID or the United States Government.

WaterQ2: Understanding Water Quality and Quantity in the Limpopo Basin

Suggested citation:

Kahler, D. M., Sharp, G. D., Edokpayi, J. N., and Rose, K. C., (2019). WaterQ2: Understanding Water Quality and Quantity in the Limpopo Basin, Environmental Mitigation and Monitoring Plan. Thohoyandou, South Africa: Limpopo Resilience Lab.

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Project Information

Project Title Water Q2: Understanding Water Quality and Quantity in the Limpopo Basin
Geographic Locations Botswana, Mozambique, South Africa, and Zimbabwe
Award Number 72067419FA00001
Implementation Dates March 2019 to March 2022

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INTRODUCTION

The transboundary Limpopo River Basin crosses Botswana, Mozambique, South Africa, and Zimbabwe. At over 400,000 km², the Limpopo River Basin is home to 18 million people living in both rural and urban areas. Industries in the Basin include businesses in the urban areas and water-intensive uses such as agriculture and mining; industrial water use is growing rapidly (LBPTC, 2010). In addition to the human residents, the Basin contains some of the most biodiverse natural areas on the planet (Kahinda et al., 2016).

The rainfall in the Basin is heterogeneous with some sub-basins receiving less than 400 mm on average and other downstream sub-basins in Mozambique receiving over 750 mm annually (LBPTC, 2010). Even meteorological stations located in close proximity demonstrate substantial spatial variation within sub-basins. The Basin has experienced severe droughts in the last decade (LBPTC, 2010). In addition to the variation in the amount of rainfall, the timing, especially the start of the growing season, has varied significantly (Edokpayi et al., 2018). However, there remain many questions about the reliability of rainfall data and other water measurements due in part to the infrequent calibration and validation of field site measurements. The limited confidence in these data, combined with the substantial variation through time and space necessitates an integrated approach to improve data collection, validation, and overall Basin water resource management in the Basin.

The goal of this project is to build resilience through the support of Basin stakeholders, including The Limpopo Watercourse Commission (LIMCOM), to improve governance around water resources management and water security in the Basin. A systems approach, such as integrated water resources management (IWRM) is needed to address such complex, large, and interrelated components of water resources. IRWM is recommended by the United States Agency for International Development (USAID) Water and Development Strategy Implementation Guide (2014). This context will be combined with data collection and validation, data sharing, and continuous evaluation of the interrelations that affect water resources. For example, surface water quality will affect ecosystem biodiversity and those who depend on those ecosystems for drinking water or fish as a food protein source. Another example is groundwater; Petrie et al. (2014) found that groundwater in the Limpopo Basin holds great potential for increased water access; however, groundwater measurement data are currently insufficient to calculate sustainable total withdrawal rates. With improved data collection, validation, and sharing of these data, managers will have a basis for scientifically-based decisions and may be able to utilize groundwater

resources more effectively to increase (e.g., agricultural) productivity. These same resource managers need monitoring and surveillance tools to measure water consumption by users within the basin, how demand and use changes through time, and to understand if historic and current sparse monitoring is accurate. Since rural users withdraw water in informal schemes, measurements of water use currently do not exist.

This project will support water resources monitoring, and the development of methods for water quality and quantity measurement based on *in situ* sensors and satellite measurements. These **measurements** will enable characterization of water resource dynamics at the whole Basin scale and form the foundation for hydrologic **modeling** that can help estimate hard-to-measure parameters and also provide holistic assessments of Basin scale stocks and flows. To support data sharing, the project will use cloud-based, automated data collection and web-based **data sharing**. All sensors and data will be shared. Increased monitoring and data sharing will provide the platform for individual biodiversity and water resources projects to conduct impact evaluations, as requested in the USAID Biodiversity and Development Handbook. The project will include key practitioners from government, academia, industry, and agriculture to be **environmental champions**. These persons will be invaluable resources to the project, local collaborators, and other stakeholders as they support a sustainable technical resource for the Basin's decision-makers.

To improve Basin data quality and sharing and produce tools that can be used in the Limpopo Basin and elsewhere, the collaborators will develop open-source methods and make measurements to characterize water resources through verifiable satellites and *in situ* sources, including autonomous sensors. For surface water quantity, the collaborators will develop methods to monitor river flow based on width and river channel geometry from satellites based on the work presented recently at the American Geophysical Union Fall Meeting (Martin et al., 2018). For groundwater, the collaborators will implement methods based on Gravity Recovery and Climate Experiment (GRACE) satellite data (Richey et al., 2015) for Basin-scale monitoring and use open-source models such as U.S. Army Corps of Engineers, Hydrologic Engineering Center, Hydrologic Modeling System (HEC-HMS) and River Analysis System (HEC-RAS) and the U.S. Geological Survey groundwater model, MODFLOW for sub-basin monitoring. Groundwater quantity and flow will be estimated based on electrical resistivity tomography (ERT) (Hubbard et al., 1999 and Vanderborght et al., 2005). We will characterize water quality using measurements of turbidity, clarity, algae, and organic matter loads. These characteristics are the most common causes of water quality impairment, biodiversity losses, and human disease risks. These characteristics can be remotely sensed based on region-specific validated algorithms.

The development of local capacity to maintain water resources and make proactive, scientifically justified management decisions requires a substantial human capital resource that is currently lacking in the Basin. The project will provide training, workshops, and conferences will focus on integrated water resources management (IWRM) and environmental flow analysis (Dyson et al., 2008 and Richter, 2009). Environmental flow analysis is a method to address minimum quantities and natural fluctuations in flow that is critical to health river populations and to maintain the ecosystem services of riparian zones. The implementation guidance for the previous USAID Water and Development Strategy specifically identified IWRM and Agricultural Water Resources Assessments in water project planning. Water resources monitoring, especially in biodiversity hotspots, will support the mission's IR 1.4, *Improved management of transboundary natural resources* with additional benefits to IR 1.1, *Improved agricultural productivity*. Based

on needs of the water professionals, technical training on subjects such as Geographical Information Systems (GIS) and hydrologic models (e.g., HEC-HMS, HEC-RAS, and MODFLOW) may be included.

The results of the water resources and biodiversity studies conducted will be compiled into a report for the Basin stakeholders. Continued high-quality data collection, training, and general logistics depends on dependable physical infrastructure. To support data collection efforts as well as training and collaboration the Limpopo Resilience Lab at the University of Venda will be established. The sustainability of lab activity will continue with the implementation of a small user fee beyond the duration of the project. Annual training workshops and conferences will be located at or nearby the Resilience Lab.

This Environmental Mitigation and Monitoring Plan (EMMP) contains the provisions that the project staff from Duquesne University (Duquesne), University of Venda (Univen), and Rensselaer Polytechnic Institute (RPI), referred to here as the collaborators, will use to eliminate or reduce any environmental impacts of the project. The EMMP is required by the program's Initial Environmental Examination (IEE) pursuant to 22 CFR 2016.

SUMMARY

The purpose of the WaterQ2: Understanding Water Quality and Quantity in the Limpopo Basin project is to improve the management of water resources in the complex, transboundary Limpopo River Basin. This will be accomplished by the collaborators through the following activities:

- Collect and share hydrologic data,
- Train students, resource managers, and decision-makers,
- Facilitate networking and communication among institutions based on shared data, and
- Establish dedicated technical resources in the Limpopo Resilience Lab.

The primary activities of this project are data collection and dissemination. This will include training on hydrological measurement and data quality control. All data collection will be through non-invasive testing such as, use of a current meter to monitor river flow, use of a pressure sensor to monitor river flow, use of passive water quality sensors, use of electrical resistivity tomography to map groundwater, and others. The overall purpose of the project is to improve water resources management; although, careful attention will be given so that decision-makers have the data and tools available to form well-developed management plans through a well-informed systems approach. All of the activities of this project fall within the Initial Environmental Examination (IEE) Intervention Category (IC) 2, 3B, or 3C.

TABLE 1: SUMMARY DETERMINATIONS FROM IEE

INTERVENTION CATEGORY	NAME	CATEGORICAL EXCLUSION OR CONDITION
2	Research, data collection, and information sharing to promote regional economic growth	§216.2(c)2(iii): Analyses, studies, academic or research workshops and meetings, and §216.2(c)2(v): Document and information transfers
3B	Technical assistance and capacity building designed to enhance terrestrial natural resources management (NRM) practices at the local, national, and regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development.	Training and capacity building to manage transboundary resources must be conducted in direct alignment and in coordination with both regional entities and relevant host country institutions and existing regional and host-country environmental and natural resource management regulations.
3C	Technical assistance and capacity building that includes instruction, training, or guidance that is formulated to alter NRM practices or change local or regional environmental conditions: fisheries and watershed management	Improved science and technology for watershed management - §216.2(c)2(i): Education, technical assistance, or training programs except to the extent such programs include activities directly affecting the environment (such as construction of facilities, etc.), §216.2(c)2(xiv): Studies, projects or programs intended to develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.) Promote linkages between watershed groups and regional entities, support stakeholder participation - §216.2(c)2(i) & §216.2(c)2(xiv)

In general, the components of this project fall within the categorical exclusions: §216.2(c)(2)(i) Education, technical assistance, or training programs except to the extent such programs include activities directly affecting the environment (such as construction of facilities, etc.); §216.2(c)(2)(ii) Controlled experimentation exclusively for the purpose of research and field evaluation which are confined to small areas and carefully monitored; and §216.2(c)(2)(xiv) Studies, projects or programs intended to develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.). For these field research components, the stipulation in (ii), which includes, “carefully monitored,” is critical. The monitoring criteria is explained in detail to satisfy this categorical exclusion.

The training and stakeholder engagement will be conducted according to the conditions specified above. Specifically, the activities will be conducted in direct alignment and coordination with the relevant local, regional, national, and transboundary institutions.

POTENTIAL ENVIRONMENTAL IMPACTS AND DETERMINATIONS

The programmatic Initial Environmental Examination (IEE) (Appendix) includes several categories of potential activities and their threshold decisions (Table I) that may be conducted within this project.

TABLE 2: RECOMMENDED THRESHOLD DETERMINATIONS

INTERVENTION CATEGORY	CATEGORICAL EXCLUSION(S)	NEGATIVE DETERMINATION(S)	POSITIVE DETERMINATION(S)	DEFERRAL OF THRESHOLD DECISION
1. The development, formulation, or promotion of policies that affect NRM, biodiversity conservation, climate resilience, or local or regional environmental conditions.	X	X		
2. Research, data collection and information sharing to promote regional economic growth, biodiversity conservation, NRM, climate resilience or local or regional environmental conditions.	X			
3A. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions.	X	X		
3B. Technical assistance and capacity building designed to enhance NRM practices at the local, national, or regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development (e.g., small-scale construction or road rehabilitation).	X	X		
3C. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices, biodiversity conservation, watershed management or change local or regional environmental conditions.	X	X		X Beyond small scale
3D. Technical assistance and capacity building designed to support adaptation and resilience to climate change and/or enable low-emission economic growth (Low Emissions Development).	X	X		X Beyond pilot scale
4. Technical assistance and Infrastructure development to improve water, sanitation and	X	X		X

TABLE 2: RECOMMENDED THRESHOLD DETERMINATIONS

INTERVENTION CATEGORY	CATEGORICAL EXCLUSION(S)	NEGATIVE DETERMINATION(S)	POSITIVE DETERMINATION(S)	DEFERRAL OF THRESHOLD DECISION
hygiene (WASH) access and behaviors.				Scaling beyond pilots
5: Infrastructure development to support biodiversity conservation, NRM, increased resilience to climate change, watershed and/or fishery management, or low-emissions development.	X	X		X > 250,000 USD
6. Facilitation, promotion, and/or provision of financing instruments and access to credit.	X	X		X Wetlands protected areas

PARTNER COUNTRY ENVIRONMENTAL CONTEXT

Applicable environmental laws are identified in IEE (Appendix). Here, the applicable policies and guidance for integrated water resources management and water rights are identified as many project activities target the management-level. All applicable local laws will be followed in the project activities. UNIVEN has already been granted express permission to conduct water investigations by the Vhembe District, Limpopo Province, South Africa.

BOTSWANA

Botswana is one of the three headwaters countries for the Limpopo River. The Botswana National Water Policy of 2012 (NWP) follows up the 2006 National Water Master Plan Review, which called for multiple reforms regarding water management. This policy stated: “Safe, affordable and reliable water and sanitation must be provided to all the people of Botswana to promote a healthy population and provide the foundations for sustainable economic development and diversification.” Water rights are unique in Botswana; it is stated that, “all water belongs to the State and is held in trust on behalf of the people of Botswana. There shall be equitable access to water and authorization for its use shall be for a defined period which shall be subject to renewal. The renewal should not be unduly denied.” Integrated water resource management (IWRM) is prescribed in the NWP (NWP 1.2.4); IWRM is defined by the UN “as the way forward for efficient, equitable and sustainable development and management of the world's limited water resources and for coping with conflicting demands.”

It is estimated that water demand in Botswana will increase from 1.934×10^8 m³/year in 2000 to 3.352×10^8 m³/year by 2020; the current demand as estimated in the 2012 NWP is 2.50×10^8 m³/year. The Ministry of Minerals, Energy and Water Resources (MMEWR) was established to ensure policies and efficient management practices are in place for water resources. The Water Resources Board will, as stated in the NWP, will ensure independence and equity in the sustainable allocation of water resources. The activities proposed in this project are intended to contribute to Botswana’s ability to monitor and manage the water resources and support transboundary management.

MOZAMBIQUE

Mozambique is downstream of the other three counties on the Limpopo River. In 1995 the National Water Policy (NWP) was created to establish policy strategy towards IWRM within the country. According to the World Bank, GDP in Mozambique relies heavily on water resources and “water shock” events correlate to cuts in GDP growth.

Water demand in Mozambique (estimated in 2000) shows total withdrawal at 635 million m³. Agriculture accounts for 87% of total withdrawal while municipal and industry consume 11% and 2% respectively (According to this Profile demand was expected to increase to 900 million³ by 2015). Mozambique’s current population of 23 million is expected to double by 2050. USAID estimated in 2008 that 60% of the rural population and 51.5% of the urban population do not have access to a reliable water supply.

The first Water Law in Mozambique was established in 1991. Like Botswana, this law places the “superficial and groundwater resources” in full state ownership. This policy also created the National Water Council (CNA), who were tasked with advising the government of water management and policy. The Water Law also established Mozambique’s first attempt at decentralized water management; they established five water agencies (ARAs) tasked to implement IWRM within the 13 basins. In 1995, the National Water Policy (NWP) was created to establish policy strategy towards stronger IWRM within the country. In 1997, an environmental law stated, “A global, integrated vision of the environment as a grouping of interdependent ecosystems which may be naturally occurring or constructed and which must be managed in such a way so as to maintain their functional equilibrium without exceeding their intrinsic limits,” which will include a systems approach and IWRM.

SOUTH AFRICA

The largest portion of the Limpopo River Basin is in South Africa. Furthermore, the UNESCO Vhembe Biodiversity Corridor, the Soutpansberg Mountains, and Kruger National Park are within the Basin in South Africa.

South Africa has a total population of 48 million people; almost 11 million of whom live within the Limpopo River Basin. It is estimated that 19 percent (9.1 million) of the rural population still lack a reliable water supply. The post-apartheid South African government has stated that water is a right to all humans regardless of race (Constitution Preamble and Chapter 2 Bill of Rights). The national government developed the Water Services Act of 1997 “CONFIRMING the National Government’s role as custodian of the nation’s water resources.” In 1998 the National Water Act was created to develop an integrated management framework for watery supply and sanitation. In 2001 the Free Basic Water Policy stated everyone has a right to receive 25 liters per person per day within 200 meters of their home. Current initiatives of the Department of Water and Sanitation are to establish Municipal Integrated Development Plans (IDP) that involve municipalities and citizens creating a proposed solution for their specific municipality.

It is currently estimated that South Africa uses 98% of its current available water supply. The surface water resources are estimated to be 43,000 million m³/year while the ground water is estimated at 4,800 million m³/year. According to a study by the Water Resource Commission, South Africa is losing 1.58 billion kiloliters of water a year, equivalent to 7.2 billion ZAR every year. The primary causes of

these losses include water theft and outdated infrastructure. The Department of Water and Sanitation (formerly, the Department of Water Affairs) does not have funding to monitor water usage or water supply. Water treatment facilities are left unchecked and underfunded. The activities in this project will hopefully provide new and less-expensive or free tools for the Department to manage water resources.

ZIMBABWE

Zimbabwe is a headwater country along the Limpopo River. The results from this project should help inform transboundary policy and may assist within Zimbabwe; however, due to USAID restrictions, data collection will not occur within the country. The collaborators will attempt to include representatives from Zimbabwe in stakeholder workshops whenever possible and to the extent partner funding is available as no USAID funds may support government representatives. The National Water Policy of 2012 (NWP) was a major defining point in Zimbabwe's effort to include IWRM.

WATER RESOURCES MONITORING (MODULE 1&3)

ACTIVITY OVERVIEW

The activities of Module 1 are to improve Basin data quality and sharing and produce tools that can be used by organizations within the Basin and elsewhere. The collaborators will develop open-source methods and make measurements to characterize water resources through verifiable satellite images and *in situ* instruments, including autonomous sensors. The collaborators will focus on temporal river and groundwater quantity and quality data. For surface water quantity, the collaborators will develop methods to monitor river flow based on width and river channel geometry from satellites. For groundwater, the collaborators will implement methods based on Gravity Recovery and Climate Experiment (GRACE) satellite data for Basin-scale monitoring and use open-source models such as U.S. Army Corps of Engineers, Hydrologic Engineering Center, Hydrologic Modeling System (HEC-HMS) and River Analysis System (HEC-RAS) and the U.S. Geological Survey groundwater model, MODFLOW for sub-basin monitoring. The collaborators will characterize water quality using measurements of turbidity, clarity, algae, and organic matter loads. These characteristics are the most common causes of water quality impairment, biodiversity losses, and human disease risks. These characteristics can be remotely sensed based on region-specific validated algorithms.

Within the Basin, the collaborators will make measurements that will provide the basis to develop satellite-based algorithms of water quantity and quality, and parameterize groundwater models. The geographic focus areas for these activities have been previously identified by RESILIM as areas of importance in terms of both groundwater and surface water resources as well as biodiversity hotspots (e.g., high elevation sites, such as the Soutpansberg Mountains).

Meteorological stations will be used to measure precipitation and other parameters. This will involve the erection of a mast, typically two-meters in height. The mast will be anchored to the ground in concrete or affixed to an existing structure. The mast will not be placed higher than necessary to avoid interference from nearby buildings or trees.

River gages will be placed in the rivers to measure the height of the water in the river. This is a standard hydrological method to monitor river flow through the means of a rating curve (Leopold and Maddock, 1953) or a sharp- or broad-crested weir (Dingman, 2002). This method requires the placement of a small pressure sensor in the water and routine data collection.

Certain water quality measurements will be made by optical measurements. Specifically, turbidity and chlorophyll are purely optical measurements and require no added reagents. Certain water quality tests may be performed in a laboratory and may involve specialized reagents or microbiological growth media.

These activities fall into the intervention category 2 of the programmatic IEE, or other categorical exclusion. Specifically, certain types of field research were not fully addressed in the IEE. These activities are among the classes of actions listed in 22 CFR 216.2(c)(2) and have no foreseeable significant direct or indirect adverse effect on the environment. Therefore, under 22 CFR 216.2(c)(1), neither an IEE nor an EA should be required for these activities. Instead, a categorical exclusion is recommended for the activities in Module 1 (Table 3). The activities are divided based on how an activity may affect the environment; as such, all modeling is grouped together while each type of environmental measurement is separate.

ENVIRONMENTAL ANALYSIS

The main field components of this project consist of the collection of water quality and quantity, and biodiversity data, and quality control on existing data sources. All of the data collection methods are passive. Such passive sensors fall within categorical exclusions (ii), (iii), and (v). These activities are unlikely to adversely affect the natural environment. The activities are localized to specific rivers and watersheds that will be heavily monitored during the project.

TABLE 3: DETERMINATION FOR CATEGORICAL EXCLUSION

ACTIVITY	RECOMMENDED DETERMINATION FOR CATEGORICAL EXCLUSION
Groundwater studies with electrical resistivity tomography	§216.2(c)(2)(ii) Controlled experimentation exclusively for the purpose of research and field evaluation which are confined to small areas and carefully monitored
River gages	
Meteorological stations	
Satellite algorithm	§216.2(c)(2)(iii) Analyses, studies, academic or research workshops and meetings
Model development	
Website creation and data sharing via data repositories	§216.2(c)(2)(v) Document and information transfers

After data collection, the analysis of data and satellite algorithm development will occur in computer laboratories at the collaborating universities. As such activities are conducted in isolated, indoor environments, there is no direct environmental impact. Duquesne University purchases renewable energy credits (RECs) to compensate for all electricity used on campus; the university Greenhouse Gas Emissions Report is available online: <https://duq.edu/academics/schools/natural-and-environmental-sciences/academic-programs/environmental-science-and-management/opportunities-and-activities/greenhouse-gas-emissions>.

After data collection, data sharing will be critical to make data available to other scientists and policy-makers. These activities will be based on web-based communication of data, workshops and conferences, and other written communication and data transfers. The culminating state of the basin report and other scholarly publications are also information transfers. All of these activities fall within CE (v). Since these activities rely only on the communication of information, there is no direct effect on the environment.

LIMITATIONS

The activities listed are categorical exclusions; however, the text of the exclusion itself sets forth the requirement for careful monitoring. The careful monitoring is the primary limitation of this CE. This monitoring requirement is evaluated for activity with potential adverse effects (Table 4). This section will only address the careful monitoring required under the field data collection components of this project.

TABLE 4: MITIGATION AND MONITORING OF ACTIVITIES THAT REQUIRE CAREFUL MONITORING

ACTIVITY	POTENTIAL ADVERSE EFFECTS	MITIGATION	MONITORING	RESPONSIBLE STAFF, TIMING AND RECORDKEEPING
Establishment of meteorological station (mast, instruments)	Digging anchor may accelerate erosion.	The mast will be located in a relatively flat area without any signs of current erosion.	During data collection and routine maintenance, the area will be assessed for erosion.	Dr. Edokpayi will maintain all station records at Univen; all staff will be responsible to document environmental monitoring. This will be done in field notes via a standardized checklist based on the approved EMMP document.
	Concrete requires river sand, the harvesting of which may encourage erosion.	Sand will only be procured from natural settings when commercial sand is not available; sand harvesting will be done sparingly and only from sand bars, not the edges of watercourses.	During harvesting, two staff must be present and must document the need and harvesting site location.	
	Erection of mast may present an unnatural obstruction for animals including birds.	When available, staff will erect masts in schools or public office areas where wild animals are minimal. Masts will not be erected higher than needed to avoid interference by trees or buildings, which should place it away from open sky and not be isolated enough to encourage nesting.	During data collection and routine maintenance, the area will be assessed for animal disturbance.	
	Data collection and routine maintenance may involve accessing sensitive environments.	When available, stations will be established where access by roads and trails are possible. Otherwise, local groups will be consulted to identify any sensitive environments to avoid during station access. This may be a concern in the Medike Nature Reserve and staff will coordinate with Endangered Wildlife Trust.	During data collection and routine maintenance, the area will be assessed for sensitive areas and any subsequent disturbance.	
Establishment of river gages (water pressure/depth sensor), and turbidity and chlorophyll sensor stations	The pressure sensor must be placed in a protective housing and anchored to a fixed height within the river. The placement of anchors in the river will always present the possibility to induce vorticity that causes an increased sediment	To avoid scour, sensors will be placed out of the main channel to reduce the water velocity around the sensor or anchor. Ideally, this will be in a wider area of the river that does not	During data collection and routine maintenance, the area will be assessed for riverbed disturbance indicative of scour.	Dr. Edokpayi will maintain all station records at Univen; all staff will be responsible to document environmental monitoring. This will be done in field notes via a standardized checklist based on the

TABLE 4: MITIGATION AND MONITORING OF ACTIVITIES THAT REQUIRE CAREFUL MONITORING

ACTIVITY	POTENTIAL ADVERSE EFFECTS	MITIGATION	MONITORING	RESPONSIBLE STAFF, TIMING AND RECORDKEEPING
	transport from the riverbed, which is called river scour.	have an appreciable mean flow.		approved EMMP document. Drs. Kahler and Rose will inspect all in-river sensors twice a year for river scour.
	The pressure sensor contains a sealed electronic sensor, datalogger, and battery. HOB0 sensors will be used, which are commercially available instruments designed for use in extreme environments (www.onsetcomp.com); nevertheless, instrument rupture is possible.	The protective housing will protect the sensor from damage from blunt force from items in the river such as rocks, logs, or crocodiles and the coated stainless steel cable will keep the sensor in place. The coated stainless steel cable is less reactive and unlikely to corrode in the river.	During data collection and routine maintenance, the sensor, housing, and cable will be assessed for damage.	
Routine groundwater monitoring with electrical resistivity tomography (ERT).	Forty-eight electrodes are hammered 5 cm into the soil; there is a risk of accelerated erosion around the sites of the electrodes.	Electrodes will not be hammered into soil along steep slopes or where erosion has already started. Areas to be avoided include river banks, roadsides, and steep soil banks.	During ERT procedures, staff will take care to monitor for any erosion in or around the electrodes.	Dr. Kahler will maintain records from ERT procedures.
	The electrical current used in ERT is very low and is conducted by the solid matrix (rock) and water. The current used is far below what soil organisms would experience in a lightning strike.	ERT instrumentation will be inspected routinely to ensure proper signal generation and output levels.	Staff will monitor for the presence of telecommunications infrastructure that could be disrupted by ERT signals.	
Laboratory water quality testing	Waste may be generated during some of these tests. In case the project adds field testing that includes reagents, any hazardous waste will be transported back to the laboratory for disposal following local regulations and university (each site) protocols.	All university laboratories have in-house facilities or contracts for hazardous materials handling and disposal including biohazardous waste and chemical hazardous waste. These disposal venues are available to the university community for such research activities. All staff will be trained in waste disposal.	Each site PI will confirm the presence of sufficient waste receptacles of the appropriate type.	Dr. Kahler, Duquesne; Dr. Edokpayi, Univen; Dr. Rose, RPI; monthly

Documentation of all scientific activities will be logged in staff laboratory notebooks. Laboratory notebooks will conform to industry standards and all staff are or will be trained in scientific recordkeeping. Copies of laboratory notebooks will be kept as source documentation. Checklists

compiled from the monitoring in this EMMP will be the final environmental monitoring documentation and maintained by Dr. Edokpayi. These documents will be passed to the Limpopo Resilience Lab, also under Dr. Edokpayi, for long-term recordkeeping.

TRAINING AND CONFERENCES (MODULE 2)

ACTIVITY OVERVIEW

Developing the local capacity to maintain water resources and make proactive scientifically justified management decisions requires a substantial human capital resource that is currently lacking in the Basin. The proposed training, workshops, and conferences will focus on IWRM and environmental flow analysis, and other scientific and management topics needed as determined through stakeholder engagement. Environmental flow analysis is a method to address minimum quantities and natural fluctuations in flow that is critical to health river populations and to maintain the ecosystem services of riparian zones. The implementation guidance for the previous USAID Water and Development Strategy specifically identified IWRM and Agricultural Water Resources Assessments in water project planning. Specifically, students and practitioners will be trained in IWRM to examine domestic, agriculture, and environmental needs (e.g., support biodiversity, environmental flow analysis), especially in those areas that have no current data. Other technical training may include Geographical Information Systems (GIS) and hydrologic models (e.g., HEC-HMS, HEC-RAS, and MODFLOW).

Each year, the collaborators will hold at least one training workshop and one conference or conference side-event. We anticipate at least 20-25 individuals will attend training workshops each year and at least 50-100+ individuals will attend the conferences or side-event each year. Additional short training workshops (e.g., one- to two-day events) are anticipated pending demand. We will work to increase attendance by broadly advertising these opportunities to diverse communities throughout the Basin. We will pay careful attention to logistics planning to create a diverse and inclusive atmosphere. The training workshops will be student and early career focused, but open broadly to those interested in learning more about IWRM practices and using measurements to inform scientifically appropriate management decisions on water resources.

These events will be used to improve the active management of water resources in the Basin, report on monitoring efforts, and improve data sharing. As a component of IWRM, the collaborators seek to involve representatives from local, regional, national, and transboundary organizations. As outlined in the WaterQ2 Mobilization Plan, the collaborators will immediately begin an inventory of stakeholders in water resources management in the Limpopo River Basin, which may include:

- LIMCOM
- South Africa Department of Water and Sanitation, Hydrologic Services Division
- South Africa Department of Environmental Affairs
- CSIR
- SAEON
- Kruger National Park
- Endangered Wildlife Trust
- Vhembe District Municipality
- Botswana Department of Water Affairs
- Zimbabwe National Water Authority
- Zimbabwe Ministry of Environment, Water, and Climate
- Mozambique Ministry of the Sea, Interior Water, and Fisheries
- Other Limpopo-focused projects, such as Resilient Waters, USAID/WRC Big Data, etc.

Furthermore, engagement with the traditional Venda Tribal Authority leadership (e.g., Rambuda Tribal Authority), who can network with smallholder farmers and community leaders throughout the South African section of the basin will be coordinated by the Office of Community Engagement. Dr. Edokpayi and his colleagues at the Univen School of Environmental Sciences have contacts with the relevant leaders in the local and district municipalities in the surrounding areas, and provincial offices. During the application preparation, the collaborators have already made contact with staff scientists from GIZ, who have conducted work for LIMCOM previously, who can assist with stakeholder engagement in the other member states.

ENVIRONMENTAL ANALYSIS

The training and conferences offered under this project fall within the categories listed in Table I from the IEE (Appendix). These activities fall within the several categorical exclusions (IC 2, 3C) and one negative determination with conditions (IC 3B). These activities are instructional in nature and do not have a direct effect on the environment. Secondary effects on the environment may include incomplete or misunderstood information and information applied without consideration of potential unintended consequences. To mitigate and monitor these risks, the collaborators will operate under two guiding strategies: building a scientific network and stakeholder engagement.

Both of these strategies involve a systems approach. A systems approach is intrinsic to IWRM. The collaborators will apply a systems approach, specifically to mitigate and monitor these potential environmental effects, through systems thinking exercises and continual reevaluation of project planning. Not unlike this EMMP, which is a living document, a systems approach is constantly examining projects, populations affected, and environments affected.

BUILDING A SCIENTIFIC NETWORK

A scientific and management network will be built under the convening power of the Limpopo Resilience Lab and Univen. This network will include the long-term involvement of the collaborators and others who perform research in the region. During the stakeholder workshops held during the project, the collaborators will cultivate a network of technical resources and organizations. The intention of this network is to provide practitioners in the Limpopo River Basin resources to ask questions and seek best practices and share information.

A large and diverse technical network will help to mitigate the potential environmental impacts. During project planning and implementation, the network will encourage practitioners to seek the input of others both in the appropriate field and adjacent fields. Ideally, this network will make best practices only a phone call or e-mail away.

STAKEHOLDER ENGAGEMENT

Stakeholder consultation will occur through the vast network of the University of Venda. For the first stakeholder workshop, the collaborators plan to focus on targeted group of national and regional resource-managers and decision-makers. As the project progresses, collaborators will seek broad participation in stakeholder workshops. Involvement of stakeholders from diverse backgrounds is a prerequisite for a robust systems-thinking analysis. The large stakeholder engagement will allow practitioners to build a strong and diverse network of non-technical stakeholders.

SPECIFIC MONITORING MEASURES

To ensure that the stipulations of the categorical exclusion and the conditions of the negative determination are satisfied, the collaborators will monitor:

- Evaluation of training (i.e., quizzes, tests)
 - Training in systems thinking
- Evaluation of training curriculum by environmental law and policy experts
- Inclusion of national institutions as stakeholders
- Diversity of scientific resources (i.e., biodiversity, water quality, surface water, groundwater)
- Diversity of non-scientific network (i.e., industries and local representative organizations)

These educational and networking activities should have a benefit on the environment, particularly on the water resources and biodiversity. Furthermore, those trained should have the tools and training to make the Limpopo River Basin more resilient to climate shocks, which should make the region more economically productive and food secure.

LIMPOPO RESILIENCE LAB (MODULE 4)

The Limpopo Resilience Lab falls within IC 2 and 3C, both which have categorical exclusions. For the purposes of the EMMP, the collaborators recommend a deferral of a final determination until year-three of this project. The final threshold determination will then be a governing document for the operation of the Lab. A deferral is recommended until the collaborators can better assess the capabilities and anticipated work of the Lab.

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APPROVAL

This Environmental Monitoring and Mitigation Plan has been received and approved by USAID. This satisfies the requirements set forth in the Milestone Plan, item #2: Completion of Environmental Mitigation and Monitoring Plan.

Signature: _____

Name: _____
Agreement Officer's Representative

Date: _____

APPENDIX: INITIAL ENVIRONMENTAL EXAMINATION

This programmatic Initial Environmental Examination (IEE) was provided by USAID. The EMMP responds to the applicable requirements of this IEE.

The IEE is included here as an appendix.



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FACESHEET

INITIAL ENVIRONMENTAL EXAMINATION

Activity/Project Title: DO1: Environment, Natural Resources and Climate Change Management Program		Solicitation #: TBD
Contract/Award Number (if known): TBD		
Geographic Location : Southern Africa Development Community member countries (Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Zambia and Zimbabwe)		
Originating Bureau: USAID/Southern Africa		
Supplemental IEE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DCN and date of Original document:	
Amendment: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	DCN and ECD link(s) of Amendment(s):	
Programmatic IEE: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Amendment No.:	
Initial Funding Amount: \$15,500,000	Life of Project Amount: \$125,000,000.00	
Implementation Start/End: FY16–FY21		
Prepared By: Kathleen Hurley, Michael Minkoff, Ashley Fox (The Cadmus Group, Inc.)	Date Submitted: September 07, 2015	
	Submitted by: Kerry Reeves, USAID/Southern Africa. Regional Environment Education and Democracy (REED) office	
Expiration Date: September 30, 2021	Reporting due dates (if any): Quarterly	
Environmental Media and/or Human Health Potentially Impacted (check all that apply): None <input type="checkbox"/> <input checked="" type="checkbox"/> Air <input checked="" type="checkbox"/> Biological Resources <input checked="" type="checkbox"/> Cultural Resources <input checked="" type="checkbox"/> Human Health <input type="checkbox"/> Other <input type="checkbox"/>		
Recommended Threshold Determination (check all that apply): <input checked="" type="checkbox"/> Negative Determination <input checked="" type="checkbox"/> with conditions <input checked="" type="checkbox"/> Categorical Exclusion <input type="checkbox"/> Positive Determination	<input checked="" type="checkbox"/> Deferral [small-scale infrastr. in sensitive areas ; scaling CC adaption pilots ; large-scale irrigation , Watsan infrastr. , Aquaculture . <input type="checkbox"/> Exemption <input type="checkbox"/> USG Domestic NEPA action	
Additional Elements <input checked="" type="checkbox"/> Conditions <input checked="" type="checkbox"/> EMMP <input checked="" type="checkbox"/> AFR ERF/ERR subproject/subgrant <input checked="" type="checkbox"/> WQAP <input type="checkbox"/> Pesticides (n/a) <input checked="" type="checkbox"/> DCA, <input checked="" type="checkbox"/> GDA PPP financial instruments		
Climate Change: <input type="checkbox"/> GCC/Adaption <input type="checkbox"/> GCC/Mitigation <input checked="" type="checkbox"/> Climate Change Vulnerability Analysis (included) Adaptation/Mitigation Measures: n/a		
DO1 will require CRM & Climate Resilient Development analysis, and amendment of this IEE in FY 2017		

SUMMARY

Program/Project Description and Scope of IEE The purpose of this document, in accordance with Title 22, Code of Federal Regulations, Part 216 (22 CFR 216), is to provide a preliminary review of the reasonably foreseeable effects on the environment of the activities under the Environment, Natural Resources and Climate Change Management Program, and on this basis, to recommend determinations and, as appropriate, attendant conditions, for these activities. Upon final approval of this IEE, these recommended determinations are affirmed as 22 CFR 216 Threshold Decisions and Categorical Exclusions, and conditions become mandatory elements of project/program implementation.

Implemented by the Regional Environment Education and Democracy (REED) office, the Environment, Natural Resources and Climate Change Management Program contributes to USAID/Southern Africa’s RDCS Development Objective (DO) 1, “Increased Sustainable Economic Growth in Targeted Areas” by enhancing biodiversity conservation, strengthening resiliency to climate change, improving access to water supply, sanitation and hygiene, and improving the enabling environment for environmental sustainability.

Recommended Determinations. The following table summarizes the determinations recommended by this IEE by intervention category. For each category, a link is provided to the entailed activity descriptions, analysis of potential environmental impacts, and activity-by-activity determinations and conditions within section 3 of the IEE.

Upon approval of this IEE, these recommendations become affirmed Categorical Exclusions and Threshold Decisions, and implementation of recommended conditions becomes mandatory.

Intervention Category	Categorical Exclusion(s)	Negative Determination(s)	Positive Determination(s)	Deferral of Threshold Decision	Link to full analysis
1. The development, formulation or promotion of policies that affect natural resource management (NRM), biodiversity conservation, climate resilience or local or regional environmental conditions	X	X			Click here
2. Research, data collection and information sharing to promote regional economic growth, biodiversity conservation, NRM, climate resilience or local or regional environmental conditions.	X				Click here
3A. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions	X	X			Click here

3B. Technical assistance and capacity building designed to enhance NRM practices at the local, national, or regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development (e.g., small-scale construction or road rehabilitation)	X	X		X Beyond small scale	Click here
3C. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices, biodiversity conservation, watershed management or change local or regional environmental conditions:	X	X		X Beyond pilot scale	Click here
3D. Technical assistance and capacity building designed to support adaptation and resilience to climate change and/or enable low-emission economic growth (Low Emissions Development)	X	X		X Scaling beyond pilots	Click here
4. Technical assistance and Infrastructure development to improve Water, Sanitation and Hygiene (WASH) access and behaviors	X	X		X >\$250K	Click here
5: Infrastructure development to support biodiversity conservation, natural resource management, increased resilience to climate change, watershed and/or fishery management, or low-emissions development.		X		X Wetlands protected areas	Click here
6. Facilitation, Promotion, and/or Provision of Financing Instruments and Access to Credit	X	X			Click here

General Implementation & Monitoring Requirements. In addition to the specific conditions enumerated in Section 3, the negative determinations recommended in this IEE are contingent on full implementation of a set of general monitoring and implementation requirements specified in Section 4 of the IEE.

These require, in summary: (1) IP Briefings on Environmental Compliance Responsibilities; (2) Development of environmental mitigation and monitoring plans (EMMPs); (3) Integration and implementation of EMMPs in workplans and budgets; (4) Integration of compliance responsibilities in prime and sub-contracts and grant agreements; (5) Assurance of sub-grantee and sub-contractor capacity


and compliance; (6) REED Team environmental compliance monitoring; (7) 22 CFR 216 documentation coverage for new or modified activities; and (8) compliance with host country requirements.

Any eventual DCA Guaranteed Parties (lenders) will not be subject to preparing EMMPs, but will be monitored during mid-term and end-term evaluations. Entities providing technical assistance to lenders may be able to produce an EMMP.

**APPROVAL OF ENVIRONMENTAL ACTION RECOMMENDED:
 DOI: ENVIRONMENT, NATURAL RESOURCES AND CLIMATE CHANGE MANAGEMENT
 PROGRAM IEE**

CLEARANCE:

Acting Mission Director:
 USAID/Southern Africa



 Alonzo Wind

Date: 8/19/2016

CONCURRENCE:

Bureau Environmental Officer:
 USAID/W/AFR



 Brian Hirsch

Date: 9/20/2016

Approved:
 Disapproved:

FILE NO: Southern Africa DOI ENRM & CC Program IEE

as revised

ADDITIONAL CLEARANCES:

Mission Environmental Officer:
 USAID/Southern Africa

Approved via Huddle (See attached)
 Judith Mlanda-Zvikaramba

Date: _____

REED Office Director:
 USAID/ Southern Africa



 Robert Rhodes

Date: 8-18-14

Acting Environment Team Leader:
 USAID/ Southern Africa

Approved via Huddle (See attached)
 Kerry Reeves


Date: _____

Acting Regional Environment Officer:
 USAID/ Southern Africa

Approved via Huddle (See attached)
 Blessing Mutsaka

Date: _____

Deputy Mission Director:
 USAID/Southern Africa



 Rebeca Kryzwda

Date: 8/18/16

Distribution List:

- USAID/Southern Africa REED/DO1 Team A/CORs and Activity Managers
- USAID/Southern Africa Office of Acquisitions and Assistance (OAA)
- USAID/Southern Africa Program Office



Overview **Files** Tasks Discussions People

RPPDO > PADS > REED ENV IEE > S.AFR_REED_IEE_07-26-2016



Approved by PADS RPPDO

Comments  0 Activity  20 Versions  2

S.AFR_REED_IEE_07-26-2016

Created by Judith Mianda Zvikaramba on Jul 26th 2016




v2 updated by Judith Mianda Zvikaramba 58 mins ago
Microsoft Word 2007 - 2013 Document (206.6kb)

KR

 **Activity** Currently showing

approved 

everyone 

Version 2 - Current version



Kerry Reeves approved S.AFR_REED_IEE_07-26-2016
Huddle Web Application

Aug 18th 2016 at 5:01am

Version 1




Blessing Mutsaka approved S.AFR_REED_IEE_07-26-2016
Huddle Web Application


Aug 8th 2016 at 11:34am




Judith Mianda Zvikaramba approved S.AFR_REED_IEE_07-26-2016
Huddle Web Application

Jul 27th 2016 at 5:32am

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INITIAL ENVIRONMENTAL EXAMINATION

PROGRAM/ACTIVITY DATA:

Program/Activity Number: TBD

Program/Activity Title: DO1: Environment, Natural Resources and Climate Change Management Program

Country/Region: Southern Africa Development Community member countries (Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Zambia and Zimbabwe)

USG Foreign Assistance Framework:

Functional Objective:

4.0 Economic Growth and Investing in People

Program Areas:

4.8 Environment

3.1 Health

Program Elements

4.8.1 Biodiversity Conservation

4.8.2 Clean Productive Environment

3.1.8 Water Supply and Sanitation

Period covered: FY16–FY21

Life of Project Amount: \$100,000,000.00

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1.0 BACKGROUND AND ACTIVITY/PROGRAM DESCRIPTION

1.1 Purpose and Scope of IEE

The purpose of this document, in accordance with Title 22, Code of Federal Regulations, Part 216 (22 CFR 216), is to provide a preliminary review of the reasonably foreseeable effects on the environment of the activities under the Environment, Natural Resources and Climate Change Management Program, and on this basis, to recommend determinations and, as appropriate, attendant conditions, for these activities. Upon final approval of this IEE, these recommended determinations are affirmed as 22 CFR 216 Threshold Decisions and Categorical Exclusions, and conditions become mandatory elements of project/program implementation.

This IEE is a critical element of a mandatory environmental review and compliance process meant to achieve environmentally sound activity design and implementation.

Implemented by the Regional Environment Education and Democracy (REED) office, the Environment, Natural Resources and Climate Change Management Program contributes to USAID/Southern Africa's RDCS Development Objective (DO) 1, "Increased Sustainable Economic Growth in Targeted Areas." The four intermediate results (IRs) that support this DO are: 1) enhanced biodiversity conservation; 2) strengthened resiliency to climate change; 3) improved access to sustainable water supply, sanitation and hygiene; and 4) improved enabling environment for environmental sustainability. The program also contributes to DO 2 – "increase resilience of people, places, and livelihoods through investments in adaptation" – and USAID's 2014 Biodiversity Policy and 2013-2018 Water and Development Strategy. In addition, the program supports four Southern Africa Development Community (SADC) protocols: 1) Wildlife Conservation and Law Enforcement of 1999; 2) Shared Water Resources of 2003; 3) Fisheries of 2001; and 4) Forestry of 2002.¹

Activities currently being implemented and analyzed in existing IEEs shall be governed by those applicable conditions; upon expiration of the existing IEEs, the conditions of this IEE shall supersede the previous IEEs. Ongoing activities operating under an approved EMMP may continue operating under that EMMP.

1.2 Background (Context and Justification)²

Natural resources are extremely valuable to the economic growth of Southern Africa, but unsustainable resource extraction, weak governance and poor management of these resources diminish the region's potential. SADC countries are concerned with deforestation, biodiversity loss, soil erosion, water quantity and quality and poor sanitation services and urban conditions. These issues are exacerbated by climate change, poverty, high unemployment insecure land tenure, lack of institutional capacity, and a growing population that depends on these natural resources to support their livelihoods. Several of these issues are discussed in further detail below.

¹ Regional Environmental Education and Democracy (REED) Environment, Natural Resources and Climate Change Management Program Concept Note

² Regional Environmental Education and Democracy (REED) Environment, Natural Resources and Climate Change Management Program Concept Note

Biodiversity Conservation and Forestry. Important ecosystems and biodiversity are found in the protected areas that make up 40 percent of SADC countries. However, Southern Africa has had the highest rate of deforestation in all of Africa since 1990 as a result of expanding agriculture, shifting cultivation, unregulated logging, population growth, migration, energy demand and limited institutional capacity. Wildlife is an important part of the Southern Africa economy through tourism and legal trophy hunting but wildlife is also at risk from invasive species, habitat fragmentation, poaching, human-wildlife conflict and illegal wildlife trade.

Water, Sanitation and Hygiene. Currently, less than 40 percent of the population in the Southern Africa region has access to safe drinking water and improved sanitation. Water stress and water scarcity are a major concern for many of the SADC countries, where it is estimated that 45 percent of the population will be faced with water stress by 2025, leading to increased competition. Climate change is likely to exacerbate this situation (see more directly below).

Climate Change. Climate change is predicted to decrease rainfall in the region by between 5 and 20 percent for major river basins. In general, climate change is likely to have serious impacts in Southern Africa, including increased water stress, increased likelihood of floods, declines in crop productivity, changes in wildlife ranges and migratory routes, increase in wildfires and rising sea-levels. Further, indirect impacts on public health can result, such as expansion of malaria and other disease transmission zones.

Southern Africa is particularly vulnerable to climate change due to limited adaptive capacity. For instance, all major rivers in the region are transnational, requiring regional management and collaboration. The region needs to better integrate natural resource and climate change planning into regional development interventions and decision-making in order to have sustainable, equitable use of these resources.

Soil and Land Management. Most of the population of Southern Africa lives in rural areas and depends on subsistence agriculture. Land is also important for conservation in parks and conservancies. The type of soil and status of land degradation varies from country to country (depending on farming methods and the physical environment), but in general, the majority of soils have low fertility, low organic content and low water retention.

1.3 Summary of Activities (and Implementation Mechanisms)³

The following IRs and illustrative interventions are planned to achieve the program's goals:

IR 1) *Enhanced biodiversity conservation.* Activities under this IR are aimed at supporting the integration of biodiversity in key development sectors. This includes combating wildlife trafficking, supporting the joint management of transboundary natural resources and conserving priority ecosystems.

IR 2) *Strengthened resiliency to climate change.* Activities target increasing the availability of regional climate information through research and analysis, testing and implementing climate-resilient practices and technologies, and building capacity of communities and governance structures to integrate climate change into planning and respond to climate change risks.

³ Regional Environmental Education and Democracy (REED) Environment, Natural Resources and Climate Change Management Program Concept Note

IR 3) *Improved access to sustainable water, supply, sanitation and hygiene (WASH)*. Activities include increasing access to sustainable water supply and sanitation, improving knowledge of best hygiene behaviors, and strengthening institutional capacity to support WASH.

IR 4) *Improved enabling environment for environmental sustainability*. Activities will provide technical support and capacity building to civil society, indigenous organizations and governance structures to improve natural resource management, and will facilitate public private partnerships for improved sustainability.

1.4 Intervention Categories for Purposes of Environmental Review

The results framework described above does not organize activities into categories consistent with efficient, transparent environmental review. Many of the activities in the different programs are similar, thus if each program were analyzed separately, it would result in an unnecessarily long and/or repetitive IEE. Thus, activities are grouped to facilitate ease of environmental analysis and review.

Therefore, for purposes of environmental review, this IEE utilizes the following activity (intervention) categories:

1. The development, formulation or promotion of policies that affect natural resource management (NRM) or local or regional environmental conditions
2. Research, data collection and information sharing to promote regional economic growth
- 3A. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions
- 3B. Technical assistance and capacity building designed to enhance terrestrial NRM practices at the local, national, or regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development (e.g., small-scale construction or road rehabilitation)
- 3C. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions:
Fisheries and Watershed Management
- 3D. Technical assistance and capacity building designed to support adaptation to climate change and/or enable low-emission economic growth (Low Emissions Development)
4. Technical assistance and Infrastructure development to improve Water, Sanitation and Hygiene (WASH) access and behaviors
5. Infrastructure development to support biodiversity conservation, natural resource management, watershed and/or fishery management, or low-emissions development.
6. Facilitation, Promotion and/or Provision of Financing Instruments and Access to credit

Each intervention category has a number of entailed activities; these will be listed, and, where not self-explanatory, explained in Section 3 of the IEE.

2.0 BASELINE INFORMATION AND APPLICABLE HOST COUNTRY REQUIREMENTS (ENVIRONMENTAL PROFILES AND LAWS OF FOCUS COUNTRIES)

2.1 Angola

2.1.1 Environmental Baseline⁴

Angola is located on the west coast of Africa between 4° 22' and 18° 02' south latitude and 11° 41' and 24 ° 05' west longitudes. Angola has a land area of 1,246,700 km² across 18 provinces. The country is bordered on the north by the Democratic Republic of the Congo and the Republic of Congo, the east by Zambia, the south by Namibia, and the west by the Atlantic Ocean, with a coastline of 1,600 km.

The climate of Angola is strongly influenced by two factors: the South Atlantic high-pressure cell and the cold northward flowing Benguela current. The South Atlantic high-pressure cell limits the southward migration of the inter-tropical convergence zone, while the Benguela current generates a strong temperature inversion along the coast that has a pronounced stabilizing effect on the lower atmosphere. This preempts the upward movement of cloud-forming moist air along the Namibian and southern portions of the Angolan coastline. The result is a gradient of increasing precipitation from south to north and from west to east

Angola can also be divided into “ecoregions” based on climate, dominant lifeforms and biogeographic affinities of the flora. Miombo is the dominant ecoregion, while Angolan Afro-montane forest, Southern Congolian Forest-Savanna Mosaic, and natural grasslands are the rarest ecoregions. In terms of species diversity, endemism, and deforestation threat, the Afro-montane forest is of particular note, but there are no conservation units whatsoever within this ecoregion. MINAMB (2006b) and Stuart and Adams (1990) make mention of the need to carry out basic biological inventories and landscape assessments of conservation potential in Afro-montane Forest and the S. Congolian Mosaic.

Angola’s management of its hydrographic basins is of utmost importance to neighboring countries, and the entire Southern Africa region, for two primary reasons. First, seven of Angola’s nine major hydrographic basins are transnational. Of these, four originate in Angola (Cunene, Cubango, Cuando, and Cuanhama). Furthermore, the Cunene, Cubango, and Cuando rivers flow into two arid countries, Namibia and Botswana. The Cuanhama system is an enclosed basin that feeds into Namibia’s Etosha pan system, one of the most important wildlife conservation areas in Southern Africa. Second, from a hydrologic viewpoint, the central plateau is critical to the water supply of neighboring countries. The headwaters of three major rivers—Kwanza, Cunene, and Cubango—originate there, with the majority of secondary rivers that make up the coastal drainage systems. The economic well-being of millions of people in the region depends on how these watersheds are managed. This is both an opportunity for collaboration and a potential source of regional conflict.

2.1.2 Environmental Laws and Regulations

In 1993, the National Secretariat for the Environment was established. Over the years, the name of this Ministry has changed several times (previously was called the Ministry of Urbanism and Environment, MINUA), but it is currently known as the Ministry of Environment (MINAMB). MINAMB is the federal ministry responsible for the coordination, development, implementation and enforcement of

⁴ Excerpt from Angola Biodiversity and Tropical Forests: 118/119 Assessment, February 2013, USDA Forest Service Office of International Programs

environmental policies (e.g., PGNA, ENA), particularly in the areas of biodiversity, environmental technologies, environmental impact assessment, and environmental education and research. In 2012, the Center for Tropical Ecology and Climate Change (CETAC) was established in central Huambo province to develop applied research, ensure environmental quality and better water management, and to study environmental quality in aquatic ecosystems.

The Government of Angola (GoA) has developed some capacity to guide, monitor and evaluate development based activities through environmental review procedures. It has committed itself to developing environmental regulations to control these activities; and the GoA Environmental Framework Law No. 5/98 of June 19, 1998 was the first step in that direction. It requires the development of Environmental Impact Assessment (EIA) reports when proposed development activity might result in significant environmental degradation. It also defines the concepts and basic principles of environmental protection, preservation and conservation, promotion of improved quality of life and a rational use of natural resources. According to that law, all Angolan citizens have the right to live in a healthy environment and to benefit from the country's natural resources. They are also upheld to help, defend and promote sustainable use of the natural resources.⁵

Angola's Decree on Environmental Impact Assessment, No. 51/2004 of July 2004 supports EIA with the goal of improving environmental protection. It provide regulations to supplement the Environmental Framework Law and establishes norms for conducting an EIA, as well as establishes which projects are subject to EIA, what should be included, the extent of public participation, responsibilities, and the monitoring process. Other relevant environmental legislation in Angola covers Fisheries, Biological and Aquatic Resources, Mining, Land use, Water, protected areas, oil, and conservation.⁶

Angola is party to various regional and international treaties and conventions related to conservation and natural resource management, including the Bamako Convention, the Convention on Biological Diversity, the Stockholm Convention on Persistent Organic Pollutants, the Kyoto Protocol, and SADC Protocol on Shared Fisheries, Forestry, Shared Watercourse Systems, and Wildlife Conservation and Law Enforcement.⁷

2.2 Botswana

2.2.1 Environmental Baseline

Botswana is a landlocked country in central Southern Africa, sharing borders with South Africa, Namibia, Zambia and Zimbabwe. The country covers 582,000 km² and is generally flat, at 900 m above sea level. Eastern Botswana contains hills and deep valleys, and ranges from 500 to 1,500 m while Western Botswana is semi-arid with rocky outcrops. More than 70 percent of the country is covered by the Kalahari Desert. The wet season occurs variably, with frequent periods of severe drought. Rainfall ranges

⁵ Excerpt from USAID/South Africa SAREP IEE, 2011

⁶ SADC Environmental Legislation Handbook 2012, Accessed via the internet on 19 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html; See table 3.1 for a list and description of relevant environmental legislation in Angola

⁷ Angola Biodiversity and Tropical Forests: 118/119 Assessment, February 2013, USDA Forest Service Office of International Programs

from 250 mm in the south west to more than 600 mm in the north east. Winters are dry with temperatures reaching as low as seven degrees Celsius, while summer temperatures are around 39 degrees Celsius.⁸

Botswana accounts for the lower end of the river basin system where the Okavango delta represents one of the most biodiversity-rich wetland ecosystems in the World with significant social, economic and ecological values. While it is unknown how many rare or threatened species of flora and fauna exist in the Delta, the wetland ecosystem as a whole is a critically endangered environment of international significance. It is understood that the perpetual change of the Delta's composition is necessary for the maintenance of the biodiversity of the wetland, yet the critical function of the flora and fauna in this process is only beginning to be studied. Current uses of the Delta waters for agricultural, mining, and domestic demands are not necessarily ecologically unsustainable, but water development plans must be carefully appraised and considered. Its protection and conservation is of paramount importance both nationally and internationally, but is strongly dependent on upstream conditions especially in Angola to maintain the desired flows for wetland ecosystem integrity.⁹

Protected areas in Botswana cover 18 percent of the land area, while an additional 22 percent of the land is designated as Wildlife Management Areas (WMAs), as buffers between protected area and areas of intensive agricultural activities. Approximately 40 percent of the national territory is rich in wildlife however, a number of constraints have inhibited biodiversity conservation in Botswana. For example, the scattered nature of resource management departments and agencies has lead to a lack of harmony in policies and uncoordinated activities.¹⁰

2.2.2 Environmental Laws and Regulations

The Botswana Government is a signatory of the Framework Convention on Climate Change, and has ratified several international and regional agreements, among them:

- Convention to Combat Desertification;
- Convention on Biological Diversity;
- Ramsar Convention on Wetlands;
- Convention on International Trade in Endangered Species (CITES);
- Southern African Centre for Ivory Marketing (SACCIM) agreement;
- SADC Protocol on Transport, Communication and Meteorology; and
- OKACOM

The Government of Botswana endeavors to maintain biodiversity by conserving natural habitats and wildlife in protected areas with minimal interference and adaptive management. Outside of the protected areas, the Government encourages the sustainable utilization of wildlife resources to boost the national economy for the benefit of its citizens. For example, the Wildlife Conservation Policy (1986) prescribes the utilization of Botswana's wildlife resources on a sustainable basis; and the Ostrich Management Policy (1994) provides for joint ventures between communities and the private sector for optimal economic benefits. The National Policy on Agricultural Development (1991) aims at replacing the food self-sufficiency goal with the concept of food security, promoting diversification of agricultural production, and incorporating the element of sustainable food production primarily through improved management of production resources; while the draft Community Based Natural Resource Management

⁸ Southern African Development Community, Botswana, Accessed via the internet on 19 November 2014 at: <http://www.sadc.int/member-states/botswana/>

⁹ Excerpt from USAID/South Africa SAREP IEE, 2011

¹⁰ Ibid.

Policy (CBNRM) seeks to foster the creation of incentives for the sustainable use and conservation of natural resources. This approach recognizes that efforts to conserve natural resources can only flourish if poverty is eradicated or kept at a minimum. The Government of Botswana has developed a land use plan to demarcate administrative blocks, and an agricultural improvement policy for the expansion of commercial practices and exploitation of niche markets such as horticulture and dairy farming.

Since its signing of the Convention on Biological Diversity, the Government of Botswana has merged or upgraded several protected areas to national park status. These include the merging of the Nxai Pan and Makgadikgadi Pan National Park, the Moremi Game Reserve with the Chobe National Park, and the Mabuasehube Game Reserve with the Gemsbok National Park. Khutse and the Central Kalahari are the only game reserves left. Area management plans exist at least in draft form for all parks except for the Khutse and Central Kalahari Game Reserves. Nine of the thirteen proposed wildlife management areas have been gazetted. Of these, management plans exist in draft form for seven of nine districts. Communal areas are also included in the district management plans.

The Government of Botswana is committed to ensuring the environmentally sustainable development of the Okavango river basin by, inter alia, its legislation, regulations and policies designed to promote the conservation and sustainable use of its natural resources, and through its National Conservation Strategy. It has developed the National Water Master Plan (NWMP) to guide the environmentally sound development of that sector through 2020, which includes the provision of adequate and secure livelihoods for those involved in agriculture. It is compulsory for all water development projects to be supported by independent EIA Studies.¹¹

In 2010, Botswana promoted the Environmental Assessment Act, No.10, which would repeal the 2005 EIA Act and addressed gaps identified in the EIA Act, including preparation of the EIA document, a review process for Environmental Impact Statements (EISs), authorization of EISs, post facto EIAs for ongoing projects, and the establishment of a certification board for EIA practitioners. This act is not yet approved by Parliament. The EIA process under the 2005 Act required a preliminary EIA, followed by scoping and an EIA if required.¹²

2.3 Lesotho

2.3.1 Environmental Baseline

Lesotho is a land-locked country located in south eastern Southern Africa, and is entirely surrounded by South Africa. It covers an area of 30,355 km² and features high mountains covering 75 percent of the country, and deep valleys. The entire territory is more than 1,000 m above sea level. The climate is continental, with four seasons and temperature extremes. Spring runs from August to October, summer from November through January, autumn from February to April (harvest time) and winter from May to July.

The Lesotho Highlands are home to cliff formations and deep in the Maloti and Drakensberg mountain ranges in southern Lesotho. The Maloti/ Drakensberg, a world heritage site, are home to around 2,500 species of plants. Landmarks in Lesotho include Thabana Ntlenyana, the highest mountain in Southern

¹¹ Excerpt from USAID/South Africa SAREP IEE, 2011

¹² SADC Environmental Legislation Handbook 2012, Accessed via the internet on 19 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

Africa at 3,483 m, Maletsunyane Falls, one of the tallest single-drop waterfalls in the region at 192 m, and Sehlabe-Thebe National Park.¹³

Water is Lesotho's main natural resource, and has become a major export industry. The Lesotho Highlands Water Project consists of large dams and canals, and transports water to South Africa. While the project has been economically successful for Lesotho, negative environmental and social implications include displaced peoples; inundated farmland, pastures and forests; and water flow disruptions affecting fish, amphibians, and other animals in the area.¹⁴

2.3.2 Environmental Laws and Regulations

Section 36 of Lesotho's Constitution states, "Lesotho shall adopt policies designed to protect and enhance the natural and cultural environment of Lesotho for the benefit of both present and future generations and shall endeavor to assure to all its citizens a sound and safe environment adequate for their health and well-being." Lesotho's National Environmental Policy of 1998 lays the groundwork for Lesotho's national development policies, management and conservation of natural resources, and integrating environment and development into decision making. To that extent, section 4.22 provides principles for EIA, including consideration of social, economic, political and cultural conditions in EIAs, as well as environmental mitigation plans for negative environmental threshold determinations.

Sectoral environmental requirements in Lesotho cover water resources, effluent disposal, air, noise, waste, energy, health, aquatic resources, forestry, mining, wildlife, natural resources, agriculture, roads, land, and urban development and waste management. The government also adheres to international environmental agreements including the Convention on the Protection of Fauna and Flora, the Convention on Fishing and Conservation of the Living Resources of the High Seas, the Convention on Climate Change, the Convention on Biological Diversity, and the Montreal Protocol for the protection of the Ozone Layer. Lesotho also adheres to SADC principles from the Policy and Strategy for Environment and Sustainable Development.¹⁵

2.4 Madagascar

2.4.1 Environmental Baseline 16

Madagascar, as a result of its isolation from the rest of the world, has unique biodiversity and high rates of endemism: more than 80 percent of its natural flora and fauna are endemic. Madagascar's unique natural resources are threatened by poverty, demographic pressure, and unproductive agricultural methods. Weak governance associated with corruption and political instability since the military coup in 2009 has led to uncontrolled illegal exploitation of natural resources. The Malagasy population is heavily dependent on natural resources with 75 percent of rural people living on subsistence agriculture and 90 percent using fuel wood for domestic energy.

¹³ Southern African Development Community, Lesotho, Accessed via the internet on 19 November 2014 at: <http://www.sadc.int/member-states/204/>

¹⁴ Lesotho 118/119 Biodiversity and Tropical Forest Assessment, 2007, Biodiversity Analysis and Technical Support Team

¹⁵ SADC Environmental Legislation Handbook 2012, Accessed via the internet on 19 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

¹⁶ Excerpt from USAID/Madagascar Health Sector Portfolio IEE, 2013

Madagascar has made an effort to preserve its natural capital by increasing the size of the country's protected area network to approximately 10 percent of the country's land surface as per the Convention on Biodiversity (CBD) and IUCN standard for protected area coverage. More than six million hectares of protected areas were created with the goal of representing 100 percent of Madagascar's habitats within the Madagascar Protected Areas System.

As mentioned above, Madagascar is prone to natural disasters such as cyclones, droughts and floods. The country has been subjected to major adverse effects from forest degradation and climate change. The annual deforestation rate for the period 2005-2010 is estimated at 0.4 percent: approximately 36,000 hectares of natural forest were lost each year between 2005 and 2010. The population growth rate is 2.65 percent and Madagascar is in the top 25 countries in terms of population growth. In the last 50 years, population has increased four-fold. This severe deforestation is driven in part by population pressures, which not only decreases forest cover, but also has devastating effects on biodiversity through habitat loss. Agricultural expansion via slash and burn agriculture is one of the primary threats to Madagascar's forests. In addition, slash and burn agriculture leads to loss in soil fertility, flooding, and drought, thereby reducing agricultural productivity. Addressing rapid population growth and the fundamental economic issues that keep rural people in abject poverty are crucial to addressing environmental protection in Madagascar.

2.4.2 Environmental Laws and Regulations 17

The Constitution of the Republic of Madagascar, Article 39, states that "Everyone shall have the duty to respect the environment; the State shall ensure its protection." The concept of sustainable development underpins all environmental policy and legal documents; three objectives are encompassed in the notion of sustainable development: 1) Maintenance of ecological integrity; 2) Improvement of economic efficiency; 3) Improvement in social equity. Madagascar's environmental policy is further informed by the National Environmental Action Plan, the Environmental Charter, and the Decree on Compatibility of Investments with the Environment (MECIE). The Ministry of the Environment, Water and Forests is responsible for the EIA process as laid out in the MECIE Decree.

In order to carry out the intent of Article 39, environmental policy, and sustainable development, several institutions and administrative structures are involved, including the following: Ministry of the Environment - Water and Forests; the National Office for the Environment, the Technical Evaluation Committee (an ad hoc committee charged with evaluation of EIA requirements) and mandated inter-sectorial cooperation among ministries to control and monitor the implementation of the EMP.

Several related orders, technical directives, and guidelines support the implementation of the MECIE decree as well as sectoral EIA guidelines for tourism, roads, aquaculture, on-and off-shore petroleum developments, textiles, forestry, mines, wetlands, and sensitive areas. An EIA is required for public or private development projects that could affect sensitive environments as defined in Order No 4355/97, types of developments that may, by its nature, size, and scale, cause an adverse impact on the environment. The related EIA must include an Environmental Management Plan. Madagascar's EIA framework is described in detail here: http://www.saiea.com/dbsa_book/madagascar.pdf.

¹⁷ Ibid.

2.5 Malawi

2.5.1 Environmental Baseline¹⁸

Malawi, a landlocked country located in Southern Africa, is one of the world's most densely populated and least developed countries. Malawi is bordered by Mozambique to the southeast, south, and southwest, Zambia to the west and northwest, and Tanzania to the north and northeast. Malawi's land mass covers 118,484 km², of which 94,080 km² is land and the remaining 24,404 km² is water. Arable land comprises a little less than 21 percent of the land area; permanent crops cover a little more than one percent and the remainder is classified under other uses. Lake Malawi, at 587 km long and 84 km wide, is the country's most prominent physical feature and constitutes more three-quarters of Malawi's eastern boundary. The Shire River flows from the south end of the lake and joins the Zambezi River 400 km further south in Mozambique. The climate in Malawi is sub-tropical with a rainy season from November to May and a dry season from May to November.

Malawi has two UNESCO World Heritage Sites, and six additional sites are on the potential list. Lake Malawi National Park, located at the southern end of the lake was recognized as a UNESCO World Heritage Site (1984) of global importance for biodiversity conservation, particularly related to fish diversity. The lake is one of the deepest in the world and provides habitat for 500-1,000 cichlid fish species. The lake is considered an important example of biological evolution, specifically for adaptive radiation and speciation in the cichlid population. The Chongoni Rock Art Area was recognized in 1997 for its rich concentration of culturally significant rock art. There are over 127 different areas where rock art is found within the site.

Increasing population density and an economy heavily dependent on agriculture has increased pressure on the natural environment and demands on natural resources. The government faces challenges in building and expanding the economy, improving education, health care, environmental protection, and becoming financially independent.

2.5.2 Environmental Laws and Regulations¹⁹

Chapter III (13)(d) of the Malawian Constitution states, "The State shall actively promote the welfare and development of the people of Malawi by progressively adopting and implementing policies and legislation aimed at achieving the following goals:

"To manage the environment responsibly in order to: 1) prevent the degradation of the environment; provide a healthy living and working environment for the people of Malawi; 2) accord full recognition to the rights of future generations by means of environmental protection and the sustainable development of natural resources; and 3) conserve and enhance the biological diversity of Malawi."

Established under the Director of Environmental Affairs, The Environmental Affairs Department (EAD) is the mandated government institution responsible for the coordination of environmental policies and programs in Malawi, monitoring development activities in the country, and for ensuring that implementation of these programs is compatible with the principles of sustainable development.

In July 1995, the Government established the Cabinet Committee on the Environment (now Cabinet Committee on Health and Environment) as the high level executive decision-making machinery on

¹⁸ Excerpt from Malawi Sustainable Economic Growth Portfolio IEE, 2013

¹⁹ Excerpt from Malawi Sustainable Economic Growth Portfolio IEE, 2013

environmental matters. The National Council for the Environment (NCE) ensures cooperation of individuals, communities, government agencies and non-governmental organizations concerned with the protection of the environment. In addition, the NCE scrutinizes development projects to ensure integration of environmental concerns in all aspects of economic development and reviews and promotes compliance with relevant environmental regulations. A Technical Committee on the Environment (TCE), established in Section 16 of the Act, provides technical advice to the NCE on a broad range of technical environmental issues that come before it. The Environmental Affairs Department provides secretarial services to the Cabinet Committee, the NCE and the TCE.

In order to maintain effective co-ordination, a system of Environmental Focal Points (EFPs) has been established in most ministries, government departments, the private sector, and non-governmental organizations. The Environmental Affairs Department develops mechanisms to enable the focal points to identify key environmental issues to be reported on a regular basis.

Malawi's 1996 Environment Management Act (EMA) establishes, inter alia, Malawi's EIA requirements and process. "The Act outlines the EIA process to be followed and provides the enabling legislation to develop EIA guidelines to ensure compliance with the EIA requirements. The Act makes EIA a statutory requirement, and a listed project cannot be licensed and implemented until a satisfactory EIA study has been completed and approved.

"In the EIA Guidelines (1997), the term 'environment' is defined as 'the physical factors of the surroundings of the human being including land, water, atmosphere, climate, sound, odor, taste and the biological factors of fauna and flora and includes the cultural, social and economic aspects of human activity, the natural and built environment'. EIA provisions in the EMA are found in sections 24–27, 29 and 63, 69 and 76."²⁰

Several types of interventions that could be pursued under the SEG portfolio DO require EIAs under Malawi's procedures; e.g.:

- Agricultural drainage projects of more than 1 ha.
- Irrigation schemes designed to serve more than 10 ha.
- Any change from one agricultural land use to another on greater than a 20 ha land holding.
- Use of more than 1 ton of fertilizer per hectare per annum on greater than a 20 ha landholding, except for lime applications.
- Construction of fish-farming or ornamental pond(s) where the capacity is greater than 100 m³ or where there is any direct discharge from a fishpond to a receiving water body.
- Any proposal to introduce fish species in an area where they do not presently exist
- Construction or expansion of groundwater utilization projects, where the utilization will be greater than 15 l/s or where the well is 60 m or deeper.
- Etc.

EAD has overall responsibility for ensuring that EIAs are carried out for all projects in accordance with national standards.

²⁰ These paragraphs quoted from the "Chapter 8: Malawi" in *Walmsley, B & Patel, S, 2011. Handbook on environmental assessment legislation in the SADC region. 3rd edition. . Pretoria: Development Bank of Southern Africa (DBSA) in collaboration with the Southern African Institute for Environmental Assessment (SAIEA).*
http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html and www.dbsa.org. Hereinafter *SADC Environmental Legislation Handbook 2012*.

Other policies and requirements. Beyond EIA, Malawi has a number of environmental licensing requirements, summarized in the table below:

Act, Regulation or Bylaw	Permit or licence	Requirements	Implementing agency
Water Resources Act CAP 72.03	Water right	A permit is required to use and/or abstract water and/or build dams.	Water Resources Board: Water Abstraction Control Subcommittee
Water Resources (Water Pollution Control) Regulations	Effluent discharge consent	This aims to control water pollution. Effluent must conform to standards set by the Malawi Bureau of Standards.	Pollution Control Subcommittee
Environment Management Act, No. 23 of 1996, section 42	Air pollution licence	A licence is required to emit any gas or other pollutants into the atmosphere.	EAD
Environment Management Act, No. 23 of 1996, section 38	Waste licence	A licence is required to handle, store, transport, classify or destroy waste other than domestic waste, or operate a waste disposal site.	EAD
Environment Management Act, No. 23 of 1996, section 39	Hazardous waste licence	A permit is required to import or export and transport any hazardous waste in Malawi.	EAD
Fisheries Conservation and Management Act, CAP 66.05	Fish farming licence	A licence is required to operate a fish farm.	Fisheries Department

Reproduced from SADC Environmental Legislation Handbook 2012, Chapter 8. Also see discussion of “Other Relevant Environmental Legislation in Malawi,” section 8.5.

2.6 Mauritius

2.6.1 Environmental Baseline

Mauritius is an island located in the Indian Ocean about 800 km east of Madagascar. It covers 2,040 km² and has a coastline of 177 km. The island contains small coastal plains rising to mountains in the center (the remnants of the volcanic crater system) encircling a central plateau. The highest point is Mt. Piton at 828 m. The climate is tropical but is affected by southeast trade winds. The dry season is from May to November and the wet, humid season is from November to May. The longest river on the island is the Grand Riviere Sud-Est, at 34 km.²¹

²¹ CIA World Factbook, Mauritius; accessed via the internet on 8 July 2015 at: <https://www.cia.gov/library/publications/the-world-factbook/geos/mp.html>

Mauritius is designated by IUCN as a center of plant diversity and is included in the Madagascar and Indian Ocean Islands biodiversity hotspot. Thirty-nine percent of plants are endemic, as well as 80 percent of non-marine birds, 80 percent of reptiles and 40 percent of bat species. The forests are home to 692 species of endemic flowering plants, 52 species of endemic vertebrates and 30 species of land birds. The marine ecosystem hosts another 1,700 species.²²

The island is of volcanic origin and is almost entirely surrounded by relatively young coral reefs. These reefs protect the shoreline and the coral and seagrass that grows in the lagoon. Thirty-six species of Genera and 90 species of hard corals have been identified in the Mauritius waters. However, the reefs face serious threats due to land clearing for sugar plantations (and related sedimentation and pesticide/fertilizer runoff), filling-in of wetlands, sand extraction for construction, uncontrolled coastal industrial development (and associated pollution) and tourism.²³

2.6.2 Environmental Laws and Regulations

While Mauritius' constitution has no clause specifying the protection of the environment, the prime minister has confirmed his commitment both to the environment and sustainable development at the 1992 UN Conference on Environment and Development. Further, the country's *Vision 2020: the national long-term perspective study* highlighted that the "physical environment sets the boundaries in which we live...we need to protect and enhance it, both for ourselves and for generations to come".

The government prepared a National Environmental Action Plan (NEAP) in 1990, followed by NEAP II for 2000-2010. NEAP II strengthened the Ministry of the Environment, replaced the Environment Protection Act (EPA) No. 34 of 1991 with the EPA No. 19 of 2002, and created the Environmental Police to enforce the EPA. NEAP III has not yet been developed but a new National Environmental Policy was published in 2007.

Section 22 of the EPA established the EIA committee, which examines EIA applications for EIA licenses. The EIA must include direct and indirect effects the project could have on the environment; social, economic and cultural assessments; mitigation measures; and environmental management and monitoring plans. For "minor" activities, only a Preliminary Environmental Report (PER) is required, which is a simplified and shorter form than the EIA.

Mauritius has other environmental legislation in place to control drinking water quality, effluent disposal, noise, air quality, radiation, conservation, agriculture and land use and tourism.²⁴ Further, Mauritius is party to international environmental agreements including the biodiversity, climate change, desertification, endangered species and hazardous wastes.²⁵

²² Convention on Biological Diversity, Mauritius-Country Profile; accessed via the internet on 8 July 2015 at: <https://www.cbd.int/countries/profile/default.shtml?country=mu>

²³ Environmental Profile, Reef Conservation ; accessed via the internet on 8 July 2015 at : <http://www.reefconservation.mu/about-mauritius/environmental-profile/>

²⁴ SADC Environmental Legislation Handbook 2012, Mauritius, SAIEA; accessed via the internet on 8 July 2015 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

²⁵ CIA World Factbook, Mauritius; accessed via the internet on 8 July 2015 at: <https://www.cia.gov/library/publications/the-world-factbook/geos/mp.html>

2.7 Mozambique

2.7.1 Environmental Baseline²⁶

Mozambique is generally low-lying, with coastal plains below 200 m covering about 42 percent of the land, especially in the south and in a belt along the coast. Plateau areas, with average elevations between 200 and 500 m, cover about 29 percent of the country. Highlands ranging from 500 to 1000 m cover about 25 percent of the land surface, with a large proportion occurring in the north and west. Mountain areas, with elevations above 1000 m occupy about 4 percent of Mozambique, and are located along the border with Malawi and Zimbabwe.

The climate of Mozambique is strongly influenced by altitude, proximity to the sea and latitude. It is semi-arid and subtropical in the south and tropical in the north, with strongly seasonal rainfall. There are two distinct seasons, a warm, wet season from November to March, and a cooler, dry season from April to October. Rainfall varies between about 1,400 mm a year near the Zambezi Delta to about 300 mm a year in the lowlands of the southern interior. The driest areas of the country lie in the interior of Gaza Province. Mountainous areas in the north and west have around 2,000 mm of rainfall a year (IIASA, 2002). Precipitation can vary dramatically from year to year. The coefficient of variation in precipitation ranges from 20 to 40 percent, with higher values occurring in the south (Reddy, 1984). Thus, droughts are common and natural.

The climate is diverse but primarily humid tropical in the northern and coastal zones, and dry tropical in southern and interior zones. Average annual temperatures vary from 26-30 degrees Celsius during the rainy season, and from 18-20 degrees Celsius during the dry season. In mountainous areas, especially in the center and north of the country, the climate may be modified by changes in the altitude. Altitude ranges from 0 m in the eastern part of the country to more than 1000 m, in the north and central western parts.

Mozambique includes 14 ecological regions, of which seven have global importance: the Agulhas Current, the East African Coast, the Lakes of the Rift Valley, the East African Mangroves, the Forests of the South Rift Valley, East and Central Miombo, and the Savannas of the Zambezi Floodplains. However, to protect all important bio-diverse ecosystems in Mozambique, there are two remaining areas to be designated officially for protection: Lake Niassa and the Inselberg Arquipelago in Zambezia Province. These two are part of the agenda of the action plan in the Conservation Policy and Strategy for Implementation.

Protected areas still face many challenges, and some are only protected on paper. Most of these areas are understaffed, underfunded, and without qualified personnel. Because these areas were either neglected during the war or only recently approved, human populations have for many years been living inside park boundaries and freely exploiting their natural resources.

2.7.2 Environmental Laws and Regulations²⁷

MICOA is the agency responsible for coordinating environmental issues in Mozambique. The agency's Environmental Framework Act (Act 20 of 1997) provides for the participation of local communities,

²⁶ Excerpt from Supplemental Environmental Assessment : Mozambique Indoor Residual Spraying (IRS) Project, RTI, 2011

²⁷ Excerpt from Supplemental Environmental Assessment : Mozambique Indoor Residual Spraying (IRS) Project, RTI, 2011

among others, in the development of policy and laws for NRM, management of protected areas, and policing environmental norms and regulations.

Provisions in the law reinforce the view that communities in protected areas retain their rights, and can use them to negotiate returns on income generated on what is “still their land”, even if these protected areas are re-classified for specific conservation purposes (CTC, 2003). An EIA Act (Decree 45/2004) provides the framework for managing environmental effects of development. The EIA Act requires that all sectoral legislation in Mozambique be revised to conform to the Act. Although on paper, EIA regulations follow internationally accepted processes (screening, scoping, consultation, assessment of impact, review, and monitoring and evaluation), in practice, numerous problems limit the effectiveness of the process. These include inconsistencies in substance and style across ministries and departments on environmental management because roles and responsibilities and modes of cooperation have not been properly defined.

EIA Regulations (Decree No. 76 of 1998)

The National Environmental Management Programme is the guiding policy for environmental protection and EIA is mandatory to all activities that may cause significant impacts. The Framework Environmental Act establishes the regime of the environmental licensing based on an EIA. Decree No. 76/98 of 29 December 1998 defines the EIA Regulations (comprising 19 Articles).

Article 2 specifies the range of development projects requiring some form of EIA, and is applicable to all public or private activities that may have a direct or indirect impact on the environment.

Article 3 defines MICOA’s responsibilities to issue and publicise general directives on EIA procedures, approve the terms of reference, review EIAs and issue environmental licenses.

Article 4 specifies document requirements. To begin an EIA the proponent must present to MICOA a description of the activity, an executive summary of the project and the salient environmental and socio-economic features of the project location.

Article 5 defines pre-assessment procedures. All activities not covered in the Appendix of the EIA regulations but capable of causing significant environmental impact are subject to a pre-assessment by MICOA to determine the level of EIA required.

2.8 Namibia

2.8.1 Environmental Baseline

Namibia is located in southwestern Africa along the Atlantic Ocean. Its neighboring countries are Angola, Botswana, Zimbabwe and South Africa. Namibia covers 825,615 km², of which 1,000 km² is water. The climate is mostly desert-like, hot and dry with sparse and variable rainfall.²⁸ The Namibian landscape consists of five main geographical areas, the Central Plateau, the Namib Desert, the Escarpment, the Bushveld, and the Kalahari Desert. There are also isolated mountains throughout Namibia that create micro-climates and habitat for organisms that are not adapted to the desert. Rivers are found along the

²⁸ CIA World Factbook, Namibia

country's borders, such as the Orange, Kunene, Okavango, Kwando and Zambesi Rivers. Fish River Canyon is located in the south at 161 km long, 27 km wide and 550 m deep.²⁹

Namibia has one of the driest hydro-climatic conditions in the region, making it highly dependent on groundwater and the trans-boundary river systems on its southeastern and northern borders. Although a relatively small section of the area is in the 'active' Okavango river basin, a significantly larger area of land comes into consideration in the more extensive 'mega' basin context with significant ground water issues. The Kavango and Caprivi Regions are relatively densely populated (4.0 persons/km and 5.5 persons/km respectively) with moderately dense livestock populations that are dependent upon the Kavango river, the Zambezi river and their floodplains, home to significant numbers of people that farm there during the dry seasons. The Caprivi region boasts of high biological richness, extremely high elephant populations, extensive freshwater ecosystems, and highly diverse representations of avian fauna, savannah and woodland species, as well as floodplain species. Much of the Caprivi land area is made up of national parks and communal land with a growing human population of approximately 110,000 heavily tied to natural resources and a pattern of seasonal flooding for their subsistence.

Both the Kavango and the Caprivi region experience significant flooding during periods of high rainfalls, forcing the population and their livestock to lands legally registered to communities under conservancy or communal forest status, or to higher grounds already occupied by other communities, thus causing human-human conflicts. At the same time, wildlife that frequent these areas are forced to move off the flooded plains and compete for the limited dry land, damaging crops, killing livestock, and endangering people's lives and livelihoods in increasing scenarios of human-wildlife conflict. This migration has profound impacts on the use of natural resources, and is increasingly affecting protected areas and the biological diversity they harbor. This movement and relocation (temporary or permanent) is symptomatic of the region's poor land and resource use planning. For example, efforts to undertake systematic disaster management assessment and planning that incorporates science and good floodplain management have been limited, and do not adequately incorporate the full range of environmental and social issues that must be addressed to achieve sustainability and protect the region's biological diversity.³⁰

2.8.2 Environmental Laws and Regulations

Namibia's Constitution requires the government to actively promote and maintain the welfare of the people, including "the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of Namibians both present and future." Namibia's Environmental Policy, as adopted in 1994 states that "All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established Environmental Assessments (EA) procedure." Unfortunately, this policy lacks the institutional structures and procedures needed for its effective implementation.

Namibia actively supports, and is party to several United Nations Conference on Environment and Development (UNCED)-related conventions and international and regional treaties. These include, among others:

- Convention on Biological Diversity (CBD);
- Vienna Convention for the Protection of the Ozone Layer;

²⁹ Government of Namibia, Geographical Areas, Accessed via the internet on 21 November 2014 at <http://www.gov.na/the-land>

³⁰ Excerpt from USAID/South Africa SAREP IEE, 2011

- Ramsar Convention on Wetlands;
- Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal;
- United Nations Framework Convention on Climate Change (UNFCCC);
- United Nations Convention to Combat Desertification (UNCCD);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- Protocol on Shared Watercourses Systems in the Southern Africa Development Community (SADC) Region;
- SADC Protocol on Transport, Communication and Meteorology; and
- OKACOM.

The Government of Namibia has developed sectoral strategies, policies and plans that reflect broader sustainable development issues. These include, among others:

- Natural resource management and land-use;
- Pollution control and polluter pays principle;
- Rural development and poverty reduction;
- Child welfare and violent crime;
- Precautionary Principle;
- Environmental Assessments; and
- Combating desertification

Namibia's National Biodiversity Programme covers activities such as park management plans, regional environmental profiles, environmental education, and a national biodiversity country study. Unfortunately, the country's ecological diversity is not evenly represented within the country's protected areas network, as Namibia's National Parks and Reserves were not originally designed for biodiversity conservation.³¹

2.9 Seychelles

2.9.1 Environmental Baseline³²

Seychelles is an archipelago in the Indian Ocean, northeast of Madagascar, covering 455 km² of land. The 115 islands can be divided into granitic islands or low limestone islands. The 42 granite islands are peaks on a mostly underground plateau. The largest and tallest island, Mahé, at 905 m, is a granitic island with a mountain ridge running along its length. Erosion along the steep sides of the granitic islands has created rocky outcrops. They experience a tropical climate with heavy rains from November to February. Annual rainfall on the granitic islands ranges from 2,300 to 5,000 mm.

Below 610 m, natural forests are found on the granitic islands with palms, pandans and hardwoods. Above this is the cloud forest with tree-ferns and mosses. Having been isolated for 75 million years, Seychelles now hosts a unique set of flora and fauna, many of which are ancient species. The most famous flora species is the coco-de-mer palm, which is only found in the Vallée De Mai on Praslin Island. Seventy-two endemic species of plant are found here, and one endemic mammal species, the critically

³¹ USAID/South Africa SAREP IEE

³² World Wildlife Fund, Indian Ocean, northeast of Madagascar, accessed via the internet on 21 November 2014 at <http://www.worldwildlife.org/ecoregions/at0113>

endangered Seychelles sheath-tailed bat. Twelve endemic species of landbird fauna are also found on the islands.

Two-hundred years of human settlement has seriously influenced the native biota, leading to habitat loss, fragmentation and invasive species. Alien species now make up 57 percent of total flora on the islands, and this percentage is likely to increase. Most of the lowland forests have been disturbed or destroyed. The Vallée de Mai is the best example of intact native forest, and is also a World Heritage Site. Other important sites include the Morne Seychellois National Park, which contains mountain mist forest, the Aride Special Reserve, Cousin Special Reserve, La Digue Veuve Special Reserve and Curieuse National Park.

2.9.2 Environmental Laws and Regulations

Environmental Protection in Seychelles is rooted in the constitution, of which Article 40 (e) makes every citizen responsible for protecting, preserving and improving the environment. Further, the Environment Protection Act (EPA) 9 of 1994 is the main legal framework for addressing environmental issues and problems. It provides an umbrella legislation for environmental protection enabling policy makers to introduce detailed regulations, while also providing flexibility and scope for a wide range of issues. The EPA makes provisions for the creation of regulations for EIA, which were then established in the Government Gazette in 1996. The regulations include application requirements, a list of projects requiring environmental authorization, public inspection of the EIA, authorization, and the right of appeal. These regulations were highly redrafted, but the present version brings together environmental, social, economic, health, cultural, resource management, and risk within the planning process.

The Ministry of Environment (MoE) is responsible for administering the EPA, and also for

- “Implementing policies and programmes in pursuance of the national objectives on environment protection;
- Coordinating the activities of other agencies concerned with the protection of the environment under this Act or under any other law which relates to the objectives of this Act;
- Developing standards for environmental quality and for emission or discharge of environmental pollutants from various sources;
- Commissioning research and sponsoring studies on problems relating to environmental pollution;
- Examining such manufacturing processes, materials and substances as are likely to cause environmental pollution;
- Identifying areas in which any activity shall not be carried out or shall be carried out subject to certain safeguards;
- Evolving procedures and safeguards for the prevention of accidents which may cause environmental pollution and remedial measures for such accidents;
- Collecting and disseminate information in respect of matters relating to environmental protection
- Coordinating actions required in a state of environmental emergency or any other situation which may pose a serious threat to the environment;
- Preparing manuals, codes or guidelines relating to environmental protection and for the prevention, control and abatement of pollution; and
- Carrying out such other matters as the Minister may assign for the purpose of securing the effective implementation of the provision of the Act.”

Within the Ministry are the following departments: Administration, Botanical Gardens, Conservation, Environmental Assessment and Pollution Control (EAPC), and Forestry. The EAPC administrates the

EIA regulations, and is also responsible for pollution control, environmental malpractice, coastal erosion monitoring, and public education of environmental management issues.³³

Seychelles is party to international environmental agreements related to Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution and Wetlands.³⁴

2.10 South Africa

2.10.1 Environmental Baseline³⁵

South Africa is the southernmost country in Africa and covers 1,219,090 km² of land with a population of 48.6 million. It completely surrounds Lesotho, almost completely surrounds Swaziland, and is bordered to the north by Namibia, Botswana, Zimbabwe, and Mozambique. To the west, south, and east, South Africa borders the Atlantic and Indian oceans. South Africa has three capitals; Pretoria, the administrative capital, Bloemfontein, the judicial capital, and Cape Town, the legislative capital and second largest city by population with 3.4 million people.

The landscape is divided into two major categories: the interior plateau which stretches north to the Sahara desert, and the land between the plateau and the coast. The plateau itself is characterized by wide plains with the Great Escarpment being both the highest part of the plateau and the boundary between these two major areas. The climate is mostly semiarid with subtropical areas containing 530,000 ha of indigenous or natural forests along the southern and eastern escarpment and the coastal belt. The total forested area is about 1 percent of total South African land, employs around 201,000 people in the forestry industry and compromises 1.2 percent of GDP.

The ocean surrounds South Africa on three sides with the warm south-flowing Mozambique-Agulhas current meeting the cold Benquela current. The temperature contrast partly accounts for differences in climate, vegetation and marine life between the east and west coasts. The cold waters on the west coast are richer in oxygen, nitrates, phosphates and plankton, the foundation of the South African fishing industry. The country has no navigable rivers. Only the two largest rivers, the Orange and Limpopo, can maintain permanent channels through the large sandbars blocking river mouths for most of the year. The lack of important arterial rivers or lakes requires significant water conservation and control measures and also strains the relationship between water usage and supply. The USAID Country Development Cooperation Strategy (CDSC) notes that while supply is currently only 15 billion m³, demand for water in South Africa will reach around 17.7 billion m³ by 2030. Rainfall is unreliable and unpredictable in South Africa, fluctuating between less than 500 mm per year to less than 200mm per year in the arid west. Below average rainfall is common and has periodically led to prolonged droughts followed by severe floods. The CDSC predicts that climate change will account for further declines in total precipitation throughout the country leading to additional water management challenges.

2.10.2 Environmental Laws and Regulations³⁶

³³ SADC Environmental Legislation Handbook 2012, Accessed via the internet on 24 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

³⁴ CIA World Factbook, Seychelles

³⁵ Excerpt from South Africa Improved Health Outcomes IEE, 2013

³⁶ Excerpt from South Africa Improved Health Outcomes IEE, 2013

South Africa has an extensive framework of laws and policies governing the use and management of natural resources and the environment. The South African Constitution of 1996 grants every person the right to an environment that is “not harmful to their health or well-being as well as the right to have the environment protected through reasonable legislative and other measures that prevent pollution, ecological degradation, promote conservation, and secure ecological sustainable development and the use of natural resources while promoting justifiable economic and social development.” The foundational law is the National Environmental Management Act and the associated Protected Areas Act, Biodiversity Act, and Air Quality Act.

The National Environmental Management Laws Amendment Act (NEMLA Act 2013) was signed in July 2013 to strengthen the implementation of legal requirements and administrative processes to limit possible abuse of the permit system as it relates to hunting rhinoceros and other threatened or protected species.³⁷ It amends the National Environmental Management: Air Quality Act (2004), the NEM: Waste Act (2008), the NEM: Protected Areas Amendment Act (2009), and the NEMLA of 2008. In addition to strengthening the permit system for hunting of threatened or endangered species, the NEMLA 2013 also provides a structure to properly regulate listed species and alien or invasive species. The amendment seeks to prevent over utilization of these species. NEMLA (2013) empowers the Minister to manage invasive species and respond to the threat of an invasive species more effectively.

The statutes related to pollution management also regulate management of waste. The Hazardous Substances Act provides for the “control of substances which may cause injury or ill-health to, or death of, humans by their toxic, corrosive, irritant, strongly sensitizing, or flammable nature.” The Air Quality Act provides reasonable measures for pollution prevention and minimization of ecological degradation through national norms and standards regulating air quality monitoring, management, and control. The National Water Act and the Occupational Health and Safety Act also have elements that apply to waste management.

Under the National Environmental Management Law, several acts govern management of natural resources and the environment. These include the following:

- Biodiversity Act (2004)
- Waste Act (2008)
- Weather Service Act
- Marine Living Resources Act (1998)
- Environmental Impact Assessment Regulations (2010)
- Air Quality Act (2004, 2010)
- Integrated Coastal Zone Management Act (2008)
- Physical Planning Act (1967)
- Environment Conservation Act (2003, 2009)
- National Forests Act (1998)
- Protected Areas Act (2004)
- National Parks Amendment Act (1998)
- National Water Act (1998)
- Mountain Catchment Areas Act (1970)
- Minerals and Petroleum Resources Development Act

³⁷ <http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=38536&tid=115530>

Several of these Acts have been amended in 2014 and 2015, as noted below³⁸:

- National Environmental Management: Biodiversity Act (10 of 2004)
 - Amendment to CITES Regulations, 2014
 - Regulations for the registration of professional hunters, hunting outfitters and trainers
 - Alien and Invasive Species Regulations, 2014
 - Threatened or protected species regulations do. : Publication of lists of species that are threatened or protected, activities that are prohibited and exemption from restriction
 - Amendments to the regulations on Bio-prospecting, Access and Benefit-Sharing
- National Environmental Management: Air Quality Act (39 of 2004)- National Pollution Prevention Plans Regulations
- National Environmental Management Laws Amendment Act (25 of 2014)
- National Environmental Management: Waste Amendment Act (26 of 2014)
- National Environmental Management Act (107 of 1998)
 - Regulations to phase-out the use of PCB materials and PCB contaminated materials
 - Environmental Impact Assessment Regulations
 - Regulations for admission of guilt fines: National Environmental Management Waste Act

South African law requires that activities that may have a detrimental effect on the environment must apply for an authorization from the appropriate authority and prepare an environmental impact assessment. The environmental impact assessment describes the proposed activity, its potential impact on the environment, and provisions for management and monitoring for environmental impacts throughout the life cycle of the activity.

2.11 Swaziland

2.11.1 Environmental Baseline

Swaziland is a landlocked country in Southern Africa bordered by Mozambique and South Africa. It covers 17,364 km² and ranges from 400 to 1800 m above sea level. There are four topographical and climatic areas: the Highveld, Middleveld, Lowveld, and Lubombo. The Highveld is a mountainous region with rivers, waterfalls and gorges and a temperate climate, while the Middleveld is a subtropical region at a lower altitude with fertile valleys and a warm climate ideal for crop cultivation. The Lowveld is a subtropical region covering 40 percent of the country. The region is prone to droughts but still manages large-scale sugarcane production under irrigation. Cattle farming is also carried out here, and many indigenous wildlife, birds and flora are found in protected areas. Lubombo is the smallest region, and is a subtropical area with mountains that support abundant plant and animal species. Mixed farming is the main activity carried out in Lubombo.³⁹

The Swaziland National Trust commission is responsible for the conservation of nature and cultural heritage, and therefore manages the country's nature reserves. There are four nature reserves, Hawane, Malolotja, Mantenga and Mlawula, and three game sanctuaries, the Hlane Royal National Park, Mkhaya

³⁸ Each amendment can be read in full at the following site:

<https://www.environment.gov.za/legislation/actsregulations>

³⁹Southern Africa Development Community, Swaziland, Accessed via the internet on 24 November 2014 at:

<http://www.sadc.int/member-states/swaziland/>

Game Reserve, and Mlilawne Wildlife Sanctuary.⁴⁰ Part of Africa's afro-montane region spans Swaziland, which contains high rates of endemism in flora and fauna (especially reptiles) as well as some of the only stands of conifer forest in Africa.⁴¹

Major environmental issues in Swaziland include limited potable water, the depletion of wildlife populations due to excessive hunting, overgrazing, and soil degradation and erosion. The Afro-montane forest is now patchy due to heavy grazing and the invasion of native grassland, which poses threats to the indigenous plant species.⁴²

2.11.2 Environmental Laws and Regulations

The Government of Swaziland has several policies and strategic action plans aimed at achieving sustainable development, including the National Development Strategy, the Economic and Social Reform Agenda, and the Poverty Reduction Strategy and Action Plan. Specifically, the National Development Strategy identifies environmental management as a chief priority for sustainable development.

EIA in Swaziland is managed by the Swaziland Environment Authority (SEA), the Ministry of Tourism and Environmental Affairs (MTEA) and the municipalities. The main functions of the SEA are to:

- “Establish standards and guidelines on the pollution of water, land and air, noise pollution, as well as other forms of environmental pollution.
- Develop, in cooperation with other government authorities, economic measures to encourage environmentally sound and sustainable activities.
- Promote training and education programmes in the field of the environment to create national awareness of environmental issues.
- Ensure the observance of proper safeguards in the planning and execution of all development projects, including those already in existence, that are likely to interfere with the quality of the environment.
- Initiate measures for the coordination and enforcement of environmental protection legislation.”

The SEA determines whether a proposed project will have significant negative impacts on the environment, and assigns the project a category, (1-3) based on the level of impact. Category 1 projects are not likely to have significant impacts, and do not require an EIA. Category 2 projects *could* have significant adverse impacts, but an IEE (not a full EIA) and a Comprehensive Mitigation Plan (CMP) are required to determine the extent of the impacts. Category 3 projects are required to complete in-depth EIA studies, and include dams, reservoirs, and large-scale irrigation schemes. The in-depth EIA requires an executive summary, introduction, description of the environment, prediction and evaluation of impacts, analysis of alternatives and selection of preferred option, impact management plan, a schedule for implementation and the results of any consultations.

The main environmental framework legislation is the Environmental Management Act (EMA) No. 5 of 2002. The act intends to promote and provide for the enhancement, protection and conservation of the environment and the sustainable management of natural resources. The act's definition of 'environment'

⁴⁰ Parks, Reserves and Other Protected Areas in Swaziland, Accessed via the internet on 24 November 2014 at: <http://www.parks.it/world/SZ/Eindex.html>

⁴¹ Southern Africa: South Africa, Swaziland, and Lesotho, Accessed via the internet on 24 November 2014 at: <http://www.worldwildlife.org/ecoregions/at1004>

⁴² CIA World Factbook, Swaziland

includes interactions between the biophysical environment and the health of people, but does not acknowledge the socio-economic connection as being an integral part of the environment.⁴³

Swaziland is party to international environmental agreements including biodiversity, climate change, desertification, endangered species, hazardous wastes, and ozone layer protection.⁴⁴

2.12 Zambia

2.12.1 Environmental Baseline⁴⁵

Zambia is endowed with a rich diversity of ecosystems, including vast areas of wetlands, albeit amidst numerous and intense threats to their sustenance. The ecosystems are home to a wide variety of flora and fauna, a number of which are important sources of protein for many Zambians. Some species are known to be endemic to Zambia alone; for instance the Black Lechwe, which thrives in swampy areas, is known to exist only in Zambia. The country has diverse landscape formations ranging from valleys, rivers, lakes, swamps and plateaus to escarpments and mountains. The scenic and aesthetic values these areas present offer an attraction and appreciation to Zambians and visitors alike. This varied landscape has also given rise to a wide diversity of habitats for living things.

Six hundred and twenty five nationally recognized protected areas exist within Zambia, covering approximately 309,052 km², or about 41 percent of the country's territorial area. The entire protected area system includes: National Parks, Game Management Areas and Ramsar sites (managed by the Zambia Wildlife Authority); National Forests and local forests (managed by the Forestry Department); and National Monuments and Heritage Sites (managed by the National Heritage Conservation Commission).

Zambia's forests cover 66 percent of the land (49.9 million ha); total growing stock (volume) for all land uses is 2.9 billion m³, with 72 percent of the volume in the miombo semi-evergreen forests (ILUA 2008). These forests have good potential for regeneration, as 65 percent are secondary regeneration, and only 32 percent are considered either moderately or heavily disturbed (i.e., stocking rates are reasonably good) (ILUA 2008). The growth rate of natural forests is rather low, ranging from 0.7 – 2 m³ per hectare per annum (Forest Dept., 2009).

Rapid population growth and rural-urban migration, combined with limited job opportunities, leads to over exploitation of forest reserves and illegal off-take of wildlife and fish. Worse still, a large number of Zambians depend upon fuel wood or charcoal for their domestic energy supply. Together, these practices help to explain Zambia's high deforestation rate.

2.12.2 Environmental Laws and Regulations

There are more than 30 legislative instruments in Zambia that address the conservation of biodiversity and protection of the environment. Most of these instruments were enacted more than 30 years ago and some have been reviewed several times since then. There are also corresponding policies and institutions.

⁴³ SADC Environmental Legislation Handbook 2012, Accessed via the internet on 24 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

⁴⁴ CIA World Factbook, Swaziland

⁴⁵ Excerpt from USAID/Zambia Enabling Governance Environment Improved IEE, 2013

The most important legislation, policies, and institutions in the conservation of components of biodiversity are in forestry, wildlife, agriculture, and fisheries.⁴⁶

An overall environmental and natural resources management framework exists through the National Conservation Strategy of 1985, National Environmental Management Act of 2011, and the National Policy on the Environment of 2009. In terms of legislation, the Environmental Protection and Pollution Control Act of 1990 is considered principal legislation covering a number of sectors. At the international level, Zambia is a party to the Convention on Biological Diversity (CBD) since May 28, 1993, and also to a number of other biodiversity-related international conventions. These Conventions are being implemented through the Ministry of Tourism, Environment and Natural Resources (MTENR).⁴⁷

The management of natural resources in Zambia is divided among eight different Departments spread across seven Ministries:

- Department of Fisheries (Ministry of Livestock and Fisheries Development)
- Forestry Department (Ministry of Tourism, Environment and Natural Resources)
- Department of Water Affairs (Ministry of Energy and Water Development)
- Zambia Wildlife Authority (semi-autonomous body under MTENR)
- Department of Agriculture (Ministry of Agriculture and Cooperatives, or MACO)
- Department of Livestock Development (Ministry of Livestock and Fisheries Development)
- Department of Town and Country Planning (Ministry of Local Government)
- Ministry of Lands

There is no coordinating governance structure, policy, or law that brings together the ministries tasked with natural resources to plan, implement, and monitor integrated natural resources management plans. As a result, lands are often allowed to be utilized in ways that are at cross-purposes to natural resources conservation and sustainable utilization over the long run.⁴⁸

Zambia is a party to many conventions of international importance, including the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the Ramsar Convention, the African Convention and the Convention on Biological Diversity. Most policies and laws are sector-based, however, and therefore somewhat fragmented. An overarching legal and policy framework is needed so that integrated management frameworks are feasible.⁴⁹

2.13 Zimbabwe

2.13.1 Environmental Baseline⁵⁰

Zimbabwe has a total land area of 390,000 km², and lies wholly within the tropics. Four-fifths of the country's terrain is more than 600 m above sea level, and most of the country has a sub-tropical climate. Seasonal rainfall patterns are erratic with cyclical droughts that often span several years. Monthly rainfall is much less reliable than the seasonal totals, and generally decreases from north to south. The national

⁴⁶ Excerpt from USAID/Zambia Environmental Threats and Opportunities Assessment (ETOA), 2011

⁴⁷ SADC Environmental Legislation Handbook 2012, Accessed via the internet on 24 November 2014 at: http://www.saiea.com/dbsa_handbook_update2012/dbsaFrameSet.html

⁴⁸ Excerpt from USAID/Zambia Environmental Threats and Opportunities Assessment (ETOA), 2011

⁴⁹ Excerpt from USAID/Zambia Enabling Governance Environment Improved IEE, 2013

⁵⁰ Excerpt from USAID/Zimbabwe Economic Growth SIEE, 2014

rainfall averages in the past decade have been considerably lower than the averages for this century. The country has no natural lakes and has only a few perennial rivers.

Although some 43 percent of Zimbabwe's land area is comprised of indigenous woodlands and plantation forest, much of this vegetation has been degraded. In many areas, remaining vegetation consists of little more than sparse grazing areas with scattered trees and shrubs. Fuel wood accounts for about 90 percent of national energy needs and the major source of energy in rural areas. There are vast tracts of indigenous woodlands and bushes that have been decimated to meet this demand.

Zimbabwe faces a paradox of abundant and diverse natural resources abutting rural communities plagued with poverty, malnutrition, and under-development. Growing population pressures are exacting an increasing toll on wildlife habitats, due to land-use change caused by agricultural expansion. Also, wild animals traversing park boundaries wreak havoc on neighboring communities, damage their meager crop and livestock holdings, and further increase demands to eliminate marauding species. The competition and land-use conflicts between rural communities and wildlife habitats have created an environmental and development challenge.

2.13.2 Environmental Laws and Regulations⁵¹

The Environmental Management Act No.13 of 2002 provides the institutional and legal foundation for sustainable management of natural resources and the protection of the environment. The Act addresses the prevention of pollution and environmental degradation, the preparation of a national and sub-national environmental management plans, as well as the establishment of an Environmental Management Agency and an Environment Fund (MoMET, 2002). It also requires environmental impact assessments for all projects affecting the environment.

The National Environmental Policy and Strategy of June 2009 serves as the principle guidance regarding governmental actions concerning biodiversity and forest management. It identifies the main policy goal for the environment sector as: “to avoid irreversible environmental damage, maintain essential environmental processes, and preserve the broad spectrum of biological diversity so as to sustain the long-term ability of natural resources to meet the basic needs of people, enhance food security, reduce poverty, and improve the standard of living of Zimbabweans through long-term economic growth and the creation of employment.” With regard to biodiversity, the policy articulates the goal to “develop and coordinate the implementation of an integrated strategy for biodiversity conservation in Zimbabwe”. The document recognizes Protected Areas as crucial for “protecting the full range of biodiversity of the country”. It also notes the need to “promote and support community-based initiatives, including the formation of community conservation areas and conservancies, to protect biodiversity outside the Parks and Wild Life Estate and State Forests” (World Bank, 2011).

Other, older, national policies and action plans that relate to the management, conservation and utilization of forest resources include the Forest Based Land Reform Policy, the National Conservation Strategy, and the National Action Plan on the Desertification Convention as well as the National Biodiversity Strategy and Action Plan. The Forestry Commission currently targets a completion date beyond 2014 for a new National Forestry Policy. Although Zimbabwe has developed a National Communication on the Climate Change Convention, as of 2010, little progress had been made on policy dialogue concerning climate change adaptation and biodiversity (Chagutah, 2010).

Zimbabwe has either ratified or is a party to the following conventions:

⁵¹ Excerpt from USAID/Zimbabwe Biodiversity and Tropical Forest Assessment (118/119), 2012

- Cartagena Protocol on Biosafety—party
- Convention Concerning the Protection of the World Cultural and Natural Heritage—party
- Convention on International Trade in Endangered Species (CITES)—ratified
- United Nations Convention on the Law of the Sea (UNCLOS)—ratified
- Vienna Convention for the Protection of Ozone Layer—ratified
- Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal protocol)—ratified
- United Nations Framework Convention on Climate Change (UNFCCC)—party
- Kyoto Protocol—ratified
- UN Convention on Biodiversity (CBD)—party
- United Nations Convention to Combat Drought and Desertification (UNCCD)—ratified
- Ramsar—ratified

3.0 POTENTIAL ENVIRONMENTAL IMPACTS AND RECOMMENDED DETERMINATIONS, INCLUDING CONDITIONS

As set out in section 1.4, for the purpose of environmental review, activities of the DOI: Environment, Natural Resources and Climate Change Management Program addressed by this IEE are grouped into the following intervention categories.

1. The development, formulation or promotion of policies that affect natural resource management (NRM) or local or regional environmental conditions
2. Research, data collection and information sharing to promote regional economic growth
- 3A. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions
- 3B. Technical assistance and capacity building designed to enhance terrestrial NRM practices at the local, national, or regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development (e.g., small-scale construction or road rehabilitation)
- 3C. Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions:
Fisheries and Watershed Management
- 3D. Technical assistance and capacity building designed to support adaptation to climate change and/or enable low-emission economic growth (Low Emissions Development)
4. Technical assistance and Infrastructure development to improve Water, Sanitation and Hygiene (WASH) access and behaviors
5. Infrastructure development to support biodiversity conservation, natural resource management, watershed and/or fishery management, or low-emissions development.
6. Facilitation, Promotion and/or Provision of Financing Instruments and Access to credit

Each category contains a number of entailed activities. Sections [3.1-3.9](#) describe the entailed activities and analyze their potential impacts. On this basis, determinations are recommended for each activity. In all cases, Negative Determinations entail conditions to avoid or reduce adverse impacts.

Upon approval of this IEE, recommended determinations become approved threshold decisions or categorical exclusions, and implementation of any conditions becomes mandatory.

3.1 Intervention Category 1: The development, formulation or promotion of policies that affect natural resource management (NRM) or local or regional environmental conditions

Entailed activities. This intervention category consists of the following activities:

- Supporting the development of regional policies and/or programs to foster conservation or collaborative resource management
- Supporting the development of policies and regional strategies to increase or promote climate change resilience; such policies may link to specific Global Climate Change (GCC) programming objectives (e.g., advancement of Climate Smart Agricultural practices, etc.)
- Provide support to regional and national bodies to develop, integrate, and harmonize policies to promote environmental sustainability, including forestry/agro-forestry, watershed mgmt., biodiversity, and fisheries; such policies may address both in-country and transboundary considerations
- Development or promotion of policies that mobilize funding or encourage the development of public-private partnerships to foster improved natural resource management or boost low-emission development
- Support for or formulation of policies that allocate shared resources at the river basin or catchment level (e.g., water sharing agreements, withdrawal limits, etc.)

Potential Adverse Impacts & Considerations Regarding Recommended Determinations.

Intervention Category 1 entails policy initiatives that are specifically designed to impact NRM and/or environmental decision making in Southern Africa. Although any adverse impacts would be fundamentally indirect in nature, the relative influence of these policies on environmental outcomes warrants the establishment of particular conditions.

These policy interventions seek to address a number of the region's most significant biodiversity and natural resource management challenges, which range from wildlife trafficking and the need support governmental oversight agencies, to developing harmonized and/or integrated approaches to watershed management both within and across Southern African nations, among other prioritized issues such as low emission development and Global Climate Change (GCC). Policies that inform or guide efforts in these sectors will need to reflect an awareness of potential adverse impacts and avoid the foreseeable pitfalls that could further exacerbate, rather than improve, the existing challenges. The most significant risk typically associated with policymaking efforts is that of "process capture," in which the ability to develop balanced, well informed regulation is compromised by a focus on one group's interests or priorities, or an emphasis on the lowest common denominator. In this regard, stakeholder consultation and input is critical to forming policies that are responsive to the needs of more than a single party, or subset of elite voices. For example, any effort to promote community-based anti-trafficking or community-based natural resource management groups through policy intervention should incorporate consultation and should promote a design that communities, and potentially the appropriate Civil Society Organization(s) (CSO), have indicated will have a likelihood of success. Similarly, an equitable allocation of shared water resources will depend in large part on a process in which the various interests or claimants are allowed an opportunity to participate.

Additionally, many significant natural resource management challenges contain transboundary considerations, from wildlife migration patterns to transboundary water sources. Effective management of scarce or endangered resources that crosses boundaries requires integration of regional oversight and national prioritization. Efforts at the regional level to identify and define priority policy interventions necessarily must coordinate with the appropriate host country national bodies to provide the greatest opportunity for effective long-term resource management.

Recommended Determinations. Per the above analysis, the following threshold determination is recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
Policies to foster conservation or collaborative resource management	<p>Negative determination, subject to the following conditions:</p> <ol style="list-style-type: none"> 1) Policy development must integrate or otherwise reflect current data and analysis on regional environmental trends, including principles of sustainable NRM and GCC adaptation strategies. Data and analysis may be drawn from USAID, other bilateral donor agencies, International Financial Institutions, Multilateral Development Banks, or other internationally recognized research or development entities. 2) Policies that encourage the mobilization of funding, investment, or development of private-public partnerships (PPP) shall seek to incorporate an environmental screening mechanism when environmental review mechanisms are absent and/or inadequate in the PPP and when appropriate (e.g., if the policy incentivizes banks to loan to “green” businesses). The environmental screening mechanism shall be consistent with the host country environmental regulations and developed with input from the relevant Ministry and/or oversight authority. 3) In instances where policies impact natural resources (including wildlife) of a transboundary nature, these policies must be developed in coordination with both applicable regional entities and relevant host country institutions.
Policies that increase or promote climate change resilience; such policies may link to specific Global Climate Change (GCC) programming objectives (e.g., advancement of Climate Smart Agricultural practices, etc.)	
Policies to promote environmental sustainability, including forestry/agro-forestry, watershed mgmt., biodiversity, and fisheries, pertaining only to management of resources within a country’s borders	
Policies that mobilize funding or encourage the development of public-private partnerships to foster improved natural resource management or boost low-emission development	
Policies that allocate shared resources at the river basin or catchment level (e.g., water sharing agreements, withdrawal limits, etc.).	
Policies to promote integrated and coordinated environmental management of transboundary resources, including forestry/agro-forestry, watershed mgmt.,	

biodiversity, and fisheries.	
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3.2 Intervention Category 2: Research, data collection and information sharing to promote regional economic growth.

Entailed activities. This intervention category consists of the following activities:

- Analyses of prospective gaps or areas of need for more effective national and transboundary natural resource management in Southern Africa (e.g. climate change vulnerability assessments, hydrological surveys, wildlife migration pattern monitoring, FAA 118/119 tropical forestry/biodiversity assessments).
- Capitalizing on specific opportunities to increase the availability of regional climate information through science and analysis (e.g., assessments, studies, monitoring & evaluation) to support climate change planning and adaptation.
- Cooperative development of analyses required for low-emissions project development (e.g., emissions analyses)
- Use of surveys and other data collection instruments/methods (e.g., household willingness to pay studies, stakeholder workshops, transect walks, rainfall gauges, canvassing, etc.)
- Publications, newsletters, reports, presentations, maps, etc. that convey data, information or analysis related to natural resource management, biodiversity, climate change, watershed management, and/or low emissions development (e.g., mapping climate funding opportunities) and do not encompass specific technical interventions, (e.g., best practices for fisheries management or low emission development.)

Potential Adverse Impacts & Considerations Regarding Recommended Determinations.

Activities encompassed by Intervention Category 2 will strengthen the REED portfolio and facilitate efforts in other intervention categories by increasing the availability of, and access to, relevant information, data, and analysis to improve program design and facilitate decision making. The dissemination of this type of information to other parties and stakeholders will further advance REED objectives through broader awareness of key issues, potential challenges, and proposed approaches. These activities will have no discernable adverse impact on the environment—direct or indirect—and are eligible for Categorical Exclusion under 22 CFR §216.2(c)2.

Recommended Determinations. Per the above analysis, the following threshold determinations are recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
Conducting analyses of prospective gaps or areas of need for more effective transboundary natural resource management in Southern Africa	Categorical Exclusion, per §216.2(c)2(iii): Analyses, studies, academic or research workshops and meetings
Capitalizing on specific	

opportunities to increase the availability of regional climate information through science and analysis (e.g., assessments, studies, monitoring & evaluation) to support climate change planning and adaptation.	
Cooperative development of analyses required for low-emissions project development (e.g., emissions analyses)	
Use of surveys and other data collection instruments/methods (e.g., GPS monitoring, transects/wildlife surveys, canvassing, rainfall gauges, etc.)	
Publications, newsletters, reports, presentations, maps, etc. that convey data, information or analysis related to natural resource management, biodiversity, climate change, watershed management, and/or low emissions development (e.g., mapping climate funding opportunities) and <u>do not</u> encompass specific technical interventions, (e.g., best practices for fisheries management or low emission development.	Categorical Exclusion, per §216.2(c)2(v): Document and information transfers

3.3 Intervention Category 3A: Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions

Entailed activities. This intervention category consists of the following activities:

- Training in organizational or institutional operations (e.g., staff management, financial planning, recruitment, communications, etc.)
- Training in data collection, management, assessment, and manipulation (e.g., survey methods, IT and ICT systems, integration of statistical analysis, modeling, etc.)
- Training in GIS technology and applications (e.g., geo-locating, spatial analysis, preparation of maps, etc.)
- Training in business literacy

- Formation and support to youth and community-led groups (e.g., community-based anti-poaching units, climate smart agricultural cooperatives or farmers groups, etc.)
- Increased access to financial and business development services (e.g., loan application support, assistance to village savings and loan associations [VSLAs], etc.)

Potential Adverse Impacts & Considerations Regarding Recommended Determinations

The technical assistance and capacity building activities comprising Intervention Category 3-A will support REED objectives by increasing technical knowledge, skills, and efficacy at household, community, and governmental levels that do not pertain directly to NRM or directly impact environmental conditions in Southern Africa. Most of these technical assistance and capacity building efforts will have no discernable adverse impact on the environment—direct or indirect—and are eligible for Categorical Exclusion under 22 CFR §216.2(c)2.

However, some potential indirect adverse environmental impacts may result from certain types of capacity building activities. In particular, facilitating access to finance for individuals that may establish “Green Growth” or low-emission enterprises, support eco-tourism development, undertake agro-forestry initiatives, or seek to develop sustainable fishery solutions necessitates evaluating the nature of business opportunities being sought by the individuals receiving assistance and ensuring the environmental and social impacts are properly considered.

Based on the likelihood of these and related indirect adverse impacts, such activities designed to support access to business and financial services under Category 3-A are not eligible for Categorical Exclusion. Fortunately, the technical and managerial resources and expertise upon which REED is expected to draw in implementing these specific technical assistance and capacity building activities should significantly reduce any indirect adverse impacts. Similarly, REED implementation of targeted interventions (see, for example, Intervention Categories 3-B, 3-C and 3-D) will entail specific environment management criteria that will help offset many of the types of indirect impacts cited here. The conditions specified for implementation of activities in Intervention Category 3-A will provide additional safeguards against indirect adverse impacts.

Recommended Determinations. Per the above analysis, the following threshold determinations are recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
Training in organizational or institutional operations (e.g., staff management, financial planning, recruitment, communications, etc.)	Categorical Exclusion, per §216.2(c)2(i): Education, technical assistance, or training programs
Training in data collection, management, assessment, and manipulation (e.g., survey methods, IT and ICT systems, integration of	

<p>statistical analysis, modeling, etc.)</p>	
<p>Training in GIS technology and applications (e.g., geo-locating, spatial analysis, preparation of maps, etc.)</p>	
<p>Training in business literacy (e.g., Sustainable/Eco-Tourism as a Business curriculum)</p>	
<p>Formation and support to youth and community-led groups (e.g., community-based anti-poaching units, climate smart agricultural cooperatives or farmers groups, etc.)</p>	
<p>Increased access to financial and business development services (e.g., loan application support, assistance to village savings and loan associations [VSLAs], etc.)</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) The integrity of environmental and social considerations and safeguard processes will be reviewed as support for increased access to financial and business development services is implemented. USAID will be notified when issues or concerns are identified and these will be integrated as part of regular project reporting. USAID will assess reported issues and determine appropriate follow-up actions, which may include actions ranging from providing additional technical assistance and/or capacity building to activity redesign or cessation. <p>Any project supporting and/or related to agro-forestry initiatives, eco-tourism support, and sustainable fisheries solutions shall be subject to the formal AFR subproject review process, as described below:</p>

<p>Develop small-scale activities in local communities including small enterprises contributing to aspects of people's livelihoods diversification and well-being,</p>	<ol style="list-style-type: none"> 1. The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at http://www.usaidgems.org/Documents/ComplianceForms/AFR/AFR-EnvReviewForm-20Dec2010.doc) must be completed and approved by the COR/AOR, MEO and REA prior to implementation. 2. The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF; and, 3. The environmental management conditions established by the ERF process must be generally consistent with the conditions as described in the applicable Sector Environmental Guidelines (http://www.usaidgems.org/sectorGuidelines.htm)
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3.4 Intervention Category 3B: Technical assistance and capacity building designed to enhance terrestrial NRM practices at the local, national, or regional level and promote biodiversity conservation to preserve and improve upon local or regional environmental conditions, excluding infrastructure development (e.g., small-scale construction or road rehabilitation)

Entailed activities. This intervention category consists of the following activities:

- Training and capacity building for civil society, indigenous organizations and governance structures n intervention and advocacy opportunities, avenues for coordination and collaboration, and effective communication of key natural resource management issues in Southern Africa
- Providing technical assistance to environmental management authorities or relevant oversight entities to boost conservation of priority terrestrial areas and better monitor wildlife trafficking
- Developing and/or strengthening linkages within and across biodiversity conservation, anti-wildlife trafficking, and natural resource management organizations or working groups
- Training community-based natural reserve conservation/anti-poaching groups in methods to reduce effectively monitor wildlife trafficking activities
- Facilitating creation of public-private partnerships to encourage long-term, sustainable environmental management solutions, including potential support for the adoption or development of innovative natural resource management technology solutions
- Training governmental and civil society institutions to implement, monitor, and evaluate effectiveness of transboundary resource management programs, and establishing regional or multi-national working groups on management of transboundary NRM (e.g., cross-border nature reserves and/or wildlife migration corridors)
- Promotion of improved forestry management practices and procedures (e.g., reforestation, silviculture, etc.) and reduction of unsustainable practices (e.g. illegal lumber harvesting, reducing fuel consumption, conversion of forests to agricultural lands, etc.)

Potential Adverse Impacts & Considerations Regarding Recommended Determinations. The technical assistance and capacity building under Intervention Category 3-B are directly related to strengthening environmental and natural resource management systems and will help achieve REED objectives through improving management capacity of environmental management authorities, communities, and civil society stakeholders vested in protecting threatened biodiversity and natural resources.

The intent of this intervention category is to mitigate the predominant issues facing terrestrial natural resource management and biodiversity conservation – e.g., wildlife trafficking or resource depletion from unsustainable livelihoods (e.g. brick production, lumber harvesting, etc.). This intent, coupled with the technical and managerial resources and expertise from which the REED team is expected to draw, significantly reduce the prospective risk of the activities despite their direct connection to natural resources management throughout Southern Africa. Notwithstanding, all NRM strategies and approaches advocated must align with internationally recognized best management practices and standards.

Additionally, USAID/Southern Africa support to the development of public-private partnerships may lead to the adoption of new and innovative solutions or approaches to terrestrial biodiversity conservation and natural resource management. As the specifics of these partnerships and any resultant technology solutions are not yet defined, and as these partnerships will likely include projects in or very proximate to protected nature reserves or ecologically sensitive areas, it will be essential to screen prospective partnerships and their desired outcomes against environmental and social risk criteria.

The training and capacity building for cooperative and effective management of transboundary ecosystems will have direct effect on largescale sensitive ecosystems. Additionally, this process will necessarily have to reconcile multiple host country environmental management processes and authorities. Potential adverse impacts could result both in mismanagement of natural resources – and subsequent environmental degradation and loss of sustainable tourism opportunities – as well as introduction, or exacerbation, of cross-border tensions over land tenure or oversight roles and responsibilities. As noted above, while REED’s anticipated pool of technical and managerial resources and expertise will greatly reduce these prospective risks, such activities must be implemented in alignment with the host-country and regional regulations for environmental and natural resource management, and in direct coordination with all relevant host-country bodies that will be working in collaboration within and across borders.

Finally, promotion and capacity building pertaining to forestry management has the potential for significant environmental impact. Forests are essential sources of ecosystems services providing a variety of resources upon which communities rely for subsistence and livelihoods. Improper forestry management threatens to significantly reduce biodiversity through the degradation or loss of habitats for an array of flora and fauna. Such improper management is largely driven by a combination of economic pressures facing communities coupled with traditional, unsustainable practices and limited or non-existent political will to enforce effective management and oversight of forest resources. REED is again expected to draw on significant technical and managerial resources and expertise in implementing improved forestry management programming. In so doing, REED must ensure that such interventions align with internationally recognized best management practices for forestry management.

Recommended Determinations. Per the above analysis, the following threshold determinations are recommended for activities in this intervention category:

<i>Activity or intervention sub-category</i>	<i>Recommended Determination</i>
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<p>Training and capacity building for civil society, indigenous organizations and governance structures on effective advocacy, coordination, collaboration, and effective communication of key natural resource management issues in Southern Africa</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) Training and capacity building activities must promote principles of community-based natural resource management (CBNRM) or international best practices to promote local stewardship of natural resources to improve management of local resources. The key training principles and processes should align with host-country, regional entities, and international recognized standards and best practices for natural resource management and anti-wildlife trafficking. Further, the trainings and capacity building must be inclusive of stakeholders who may be impacted by NRM, including resource users, vulnerable peoples, and indigenous peoples, among others.
<p>Providing technical assistance to environmental management authorities or relevant oversight entities to boost conservation of priority terrestrial ecosystems and better monitor wildlife trafficking</p>	
<p>Developing and/or strengthening linkages within and across biodiversity conservation, anti-wildlife trafficking, and natural resource management organizations or working groups</p>	
<p>Training community-based natural reserve conservation/anti-poaching groups in methods to reduce effectively monitor wildlife trafficking activities</p>	
<p>Training governmental and civil society institutions to implement, monitor, and evaluate effectiveness of transboundary natural resource management programs, and to establish regional or multi-national working groups on management of transboundary NRM (e.g., cross-border nature reserves and/or wildlife migration corridors)</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) Training and capacity building to manage transboundary resources must be conducted in direct alignment and in coordination with both regional entities and relevant host country institutions and existing regional and host-country environmental and natural resource management regulations.
<p>Facilitating creation of public-private partnerships to encourage long-term, sustainable environmental management solutions, including potential support for the adoption or development of innovative natural resource management technology solutions</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) The integrity of environmental and social considerations and safeguard processes will be reviewed as support for the establishment of public-private partnerships is implemented. USAID will be notified when issues or concerns are identified and these will be integrated as part of regular project reporting. USAID will assess reported issues and determine appropriate follow-up actions, which may

	<p>include actions ranging from providing additional technical assistance and/or capacity building to activity redesign or cessation.</p> <p>2) USAID will assess the environmental and social safeguards of the partner organization, and where they are found deficient, work with the partner organization to strengthen capacity in environmental management systems and capacity.</p>
<p>Promotion of improved forestry management practices and procedures (e.g., reforestation, silviculture, etc.) and reduction of unsustainable practices (e.g. illegal lumber harvesting, reducing fuel consumption, conversion of forests to agricultural lands, etc.), including potential direct or indirect technical assistance for small-scale (<5 hectare) irrigation and/or introduction of new small-scale irrigation technologies or strategies</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) Improved forestry management activities shall integrate best management practices (BMPs) reflecting local forestry ecosystem services as well as native species composition, climate, soil, and hydrology in order to maximize sustainable outcomes. BMPs must be consistent with the principles of environmental management as detailed in the USAID <i>Sector Environmental Guideline</i> for Forestry. 2) The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at http://www.usaidgems.org/Documents/ComplianceForms/AFR/AFR-EnvReviewForm-20Dec2010.doc) must be completed and approved by the COR/AOR, MEO and REA prior to construction or rehabilitation of irrigation systems. 3) The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF; and, 4) The environmental management conditions established by the ERF process must be generally consistent with the conditions small-scale irrigation enumerated immediately above and, at minimum, consistent with the criteria established in USAID’s Sector Environmental Guidelines for each of Agriculture and Forestry. 5) Small-scale irrigation projects and strategies must be appropriately integrated into broader integrated water resource management planning being conducted by host-country, regionally, and in line with internationally recognized standards and best practice.
<p>Technical assistance, training, and capacity building for medium- or large- scale irrigation activities (i.e., larger than 5 hectares).</p>	<p>Deferral.</p> <p>Irrigation activities of scale larger than 5 hectares must be reviewed and considered on a case by case basis.</p>

3.5 Intervention Category 3C: Technical assistance and capacity building that includes instruction, training or guidance that is formulated to alter NRM practices or change local or regional environmental conditions: Fisheries and Watershed Management

Entailed activities. This intervention category consists of the following activities:

- Assess potential impacts of climate change on watersheds, including biodiversity, water volume, precipitation and environmental flow, and identify the most vulnerable ecosystems via data collection, GIS mapping, and field assessments;
- Support research and analyses that assess water supply and demand in key sub-catchments and identify ecological flow needs in critical biodiversity areas;
- Build capacity within governments and communities to formulate potential climate change adaptation policies and strategies targeted on watershed management and fisheries;
- Improved science and technology for watershed management, such as hydro-climate monitoring, vulnerability assessments, decision-support tools);
- Identify practices that negatively impact effective watershed management and implement corrective measures, such as cattle exclusion, restoration of riparian areas, watershed maintenance and restoration, community-based forest management, and water management
- Demonstrate, via community-based pilot projects, climate change adaptation strategies related to water management in critical biodiversity areas, such as rainwater harvesting, water re-use or improved irrigation efficiency. The pilots may focus on innovative approaches to water allocation, conservation, and demand management.
- Training and capacity building to improve management of fisheries at the community level, which may include introduction of alternative fishing gear, community-based management strategies, marine/lacustrine protected areas for improved management of fish stocks, among others.
- Support training and capacity building to improve community governance of natural resources and effective management of water and biodiversity, such as training in fisheries law and licensing requirements, forestry policies, etc.;
- Promote linkages between watershed management groups and regional entities, where appropriate.
- Support active stakeholder participation in natural resource management and policy dialogues, including local communities, traditional leaders, civil society representatives, businesses, private sector investors, and others.

Potential Adverse Impacts & Considerations Regarding Recommended Determinations

A number of the activities anticipated under this category present no potential for adverse impacts on the environment, for example, activities solely focused on building capacity to improve science and technology for monitoring climatological and hydrological conditions and vulnerability assessments. However, other activities, may potentially negatively impact the physical environment via implementation or inadvertently cause changes in composition of native species; a negative determination with conditions is recommended for these activities, as summarized in the table below.

Climate change will have significant impacts on the availability of water for the countries in Southern Africa. While strategies to improve resiliency of communities and water resources are aimed at improving management, depending on the types of adaptation strategies and natural resource management practices, some of the strategies have the potential to impact natural resources and/or

human health. In particular, community-based natural resource management could lead to activities requiring environmental mitigation. Furthermore, watershed management and fisheries activities, if not managed for potential impacts, can cause the alteration of natural or existing systems that could affect the greater ecosystem. Tree planting and watershed restoration activities that use inappropriate species can reduce diversity, alter ecosystem services, and negatively impact the robustness of native species. Additionally, use of harmful inputs in watershed restoration activities, such as tree planting, also poses a potential risk of pollution of water and soil with pesticides, fertilizers, which may impact human and ecological health. Furthermore, these activities may have inadvertent impacts on ecosystem dynamics, causing shifts that impact plant and animal diversity and reduce the system’s adaptive capacity.

Fisheries management technical assistance may introduce new technologies and equipment that could improve catch and more effectively target appropriate size classes and/or species. While intended to improve fisheries management, these activities may induce ecosystem change if utilized improperly or not fully analyzed prior to implementation.

Recommended Determinations. Per the above analysis, the following threshold determinations are recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
Assess potential impacts of climate change on watersheds, including biodiversity, water volume, precipitation and environmental flow, and identify the most vulnerable ecosystems via data collection, GIS mapping, and field assessments	Categorical Exclusion, per §216.2(c)2(i): Education, technical assistance, or training programs and (xiv) Studies, projects or programs intended to develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.);
Support research and analyses that assess water supply and demand in key sub-catchments and identify ecological flow needs in critical biodiversity areas	Categorical Exclusion, per §216.2(c)2(i): Education, technical assistance, or training programs and (xiv) Studies, projects or programs intended to develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.);
Build capacity within governments and communities to formulate potential climate change adaptation policies and strategies targeted on watershed management and fisheries	Categorical Exclusion, per §216.2(c)2(i): Education, technical assistance, or training programs
Improved science and	Categorical Exclusion,

<p>technology for watershed management, such as hydro-climate monitoring, vulnerability assessments, decision-support tools</p>	<p>per §216.2(c)2(i): Education, technical assistance, or training programs and (xiv) Studies, projects or programs intended to develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.);</p>
<p>Identify practices that negatively impact effective watershed management and implement corrective measures, such as cattle exclusion, restoration of riparian areas, watershed maintenance and restoration, community-based forest management, and water management</p> <p>Training and capacity building to improve management of fisheries at the community level, which may include introduction of alternative fishing gear, community-based management strategies, marine/lacustrine protected areas for improved management of fish stocks, among others.</p> <p>Development of small-scale watershed management activities in local communities, including small enterprises contributing to aspects of people’s livelihoods diversification and well-being,</p>	<p>Negative determination, subject to the following conditions:</p> <p>When specific activities are identified for pilot projects and/or measures to improve NRM, the formal AFR environmental review process (ERF) shall be completed in order to determine the level of impact and necessary mitigation measures. Activities, such as rainwater harvesting can have significant environmental and social impact, if they do not incorporate best practices in design and community consultation.</p> <p>Additionally,</p> <ol style="list-style-type: none"> 1) Training, capacity building, and information sharing activities must be discuss how to incorporate environmental and social safeguards and considerations as part of watershed management and fisheries management measures. 2) Activities shall be implemented consistent with the USAID Sector environmental Guidelines for Forestry and Fisheries. 3) Technical assistance which introduces the use of new equipment or harvesting techniques must be evaluated and analyzed for their potential to generate shifts in ecosystem function and services. 4) Technical assistance that includes direct support to small-scale construction or rehabilitation of buildings or roads is subject to the conditions established under Invention Category 5.
<p>Demonstrate, via community-based pilot projects, climate change adaptation strategies related to water management in critical biodiversity areas, such as rainwater harvesting, water re-use or improved irrigation efficiency. The pilots may focus on innovative approaches to water allocation, conservation,</p>	<p>Negative determination, subject to the following conditions:</p> <p>When specific activities are identified for community-based pilot projects and/or measures to improve NRM, the formal AFR environmental review process (ERF) shall be completed in order to determine the level of impact and necessary mitigation measures.</p> <p>Additionally,</p> <ol style="list-style-type: none"> 1) Training, capacity building, and information sharing activities

<p>and demand management.</p>	<p>must be discuss how to incorporate environmental and social safeguards and considerations as part of watershed management and fisheries management measures.</p> <ol style="list-style-type: none"> 2) Activities shall be implemented consistent with the USAID Sector environmental Guidelines for Forestry, Irrigation, and Fisheries. 3) Technical assistance which introduces the use of new equipment or harvesting techniques must be evaluated and analyzed for their potential to generate shifts in ecosystem function and services. <p>DEFERRAL If it is anticipated the pilot activities, such as rainwater harvesting, water re-use, or improved irrigation efficiency will be scaled up beyond five pilot sites, then the activity is subject to a more detailed review to determine the potential range of impacts. Activities, such as rainwater harvesting can have significant environmental and social impact, if they do not incorporate best practices in design and community consultation; thus, warranting further environmental review.</p>
<p>Support training and capacity building to improve community governance of natural resources and effective management of water and biodiversity, such as training in fisheries law and licensing requirements, forestry policies, etc.;</p>	<p>Negative determination, subject to the following condition: When specific activities are identified for pilot projects and/or measures to improve NRM, an environmental review form shall be completed in order to determine the level of impact and necessary mitigation measures.</p> <p>Additionally,</p> <ol style="list-style-type: none"> 1) Training, capacity building, and information sharing activities must discuss how to incorporate environmental and social safeguards and considerations as part of watershed management and fisheries management measures. 2) Activities shall be implemented consistent with the USAID Sector environmental Guidelines for Forestry and Fisheries, where applicable. 3) Technical assistance which introduces the use of new equipment or harvesting techniques must be evaluated and analyzed for their potential to generate shifts in ecosystem function and services. 4) Technical assistance that includes direct support to small-scale construction or rehabilitation of buildings or roads is subject to the conditions established under Intervention Category 5.
<p>Promote linkages between watershed management groups and regional entities, where</p>	<p>Categorical Exclusion, per §216.2(c)2(i): Education, technical assistance, or training programs and (xiv) Studies, projects or programs intended to</p>

<p>appropriate.</p> <p>Support active stakeholder participation in natural resource management and policy dialogues, including local communities, traditional leaders, civil society representatives, businesses, private sector investors, and others.</p>	<p>develop the capability of recipient countries to engage in development planning, except to the extent designed to result in activities directly affecting the environment (such as construction of facilities, etc.);</p>
<p>Training and capacity building for aquaculture development and management.</p>	<p>DEFERRAL</p>

3.6 Intervention Category 3D: Technical assistance and capacity building designed to support adaptation to climate change and/or enable low-emission economic growth (Low Emissions Development), excluding infrastructure development.

Entailed activities. This intervention category consists of the following activities:

- Technical assistance to project developers, including provision of workshops, seminars, online training and instructor-led training as well as exchanges for technical staff with other USG agencies, on climate-resilient and low emission development strategies
- Strengthening governance structures to respond to climate risks and support the integration of climate change into planning and decision-making for sustainable development
- Embedding technical staff within government entities to provide mentoring, direct knowledge sharing, and other assisted capacity building in low-emission and Green Growth development
- Supporting information transfer and sharing through awareness campaigns, development of roundtable working groups, and related communication efforts
- Fostering the establishment of PPPs to improve mobilization of resources and opportunities for low-emission project development and technical assistance for future management of “green tech”
- Training and capacity building in Climate-Smart agriculture techniques, including potential introduction of new small-scale irrigation technologies and strategies.

Potential Adverse Impacts & Considerations Regarding Recommended Determinations

The technical assistance and capacity building under Intervention Category 3-D will support overall REED objectives by fostering greater awareness and capacity among Southern Africa stakeholders regarding opportunities to seek low-emission or “green” development opportunities and adapt and reduce vulnerability to a rapidly changing climate. Low-emission development strategies can be wide ranging

and have the potential to span a variety of sectors, and may be inclusive of Climate Smart Agriculture (CSA) techniques, climate-resilient construction, introduction of new energy solutions, among other prospective opportunities. This variety, as well as the necessary intersection with sectors including natural resource management, agriculture, and infrastructure development, mean that support for low-emissions and climate-resilient development strategies requires incorporation of environmental and social safeguards processes. With processes developed in coordination with all relevant host-country and regional environmental management bodies and embedded within the strategies, such that all resultant future projects are screened for environmental and social risks, will help ensure the long-term efficacy of the development approaches.

Additionally, while the overall objective of this intervention category is to move away from higher-emission development alternatives and strengthen the region against the impacts likely to result from a changing climate, mismanagement, dissemination of poor information, or ineffective implementation or planned interventions could instead have the opposite effect, or could fail to maximize the intended positive impacts, resulting in an increased exposure to climate change vulnerabilities or missed opportunities to choose the strongest “green” development alternatives. Failed climate resiliency initiatives in particular could result in over-abstraction or misallocation of scarce resources, or introduce practices that fail to prepare target beneficiaries for the most likely impacts.

CSA techniques could involve introduction of new small-scale irrigation techniques or strategies; improper use of irrigation technologies can result in myriad environmental impacts including over-abstraction of water sources, contamination of nearby water bodies due to run-off, contribution to soil erosion, among others. Climate-resilient construction activities, while improving the siting and design process to incorporate environmental variables, still have the potential for common impacts that stem from construction activities (these are covered in depth under Intervention Category 5).

Recommended Determinations. Per the above analysis, the following threshold determinations are recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
Technical assistance to project developers, including provision of workshops, seminars, online training and instructor-led training as well as exchanges for technical staff with other USG agencies, on climate-resilient and low emission development strategies	<p>Negative determination, subject to the following conditions:</p> <ol style="list-style-type: none"> 1) Training, capacity building, and information sharing activities must be discuss how to incorporate environmental and social safeguards and considerations as part of the low emissions and climate-resilient development strategies 2) The prioritized low-emission and climate resilient development strategies must align with internationally recognized standards and best practices as well as host-country and regional goals and needs. 3) Training on improved construction practices in small-scale settings will be consistent with the <i>USAID Sector Environmental Guidelines</i> for Construction. 4) Technical assistance that includes direct support to small-scale construction or rehabilitation of buildings or roads is subject to the conditions established under Invention
Strengthening governance structures to respond to climate risks and support the integration of climate change into planning and decision-making for sustainable development	
Embedding technical staff within	

<p>government entities to provide mentoring, direct knowledge sharing, and other assisted capacity building in low-emission and Green Growth development</p>	<p>Category 5.</p>
<p>Supporting information transfer and sharing through awareness campaigns, development of roundtable working groups, and related communication efforts</p>	
<p>Fostering the establishment of Public-Private partnerships to improve mobilization of resources and opportunities for low-emission project development and technical assistance for future management of “green tech”</p>	<p>Negative determination, subject to the following conditions:</p> <ol style="list-style-type: none"> 1) The integrity of environmental and social considerations and safeguard processes will be reviewed as support for the establishment of public-private partnerships is implemented. USAID will be notified when issues or concerns are identified and these will be integrated as part of regular project reporting. USAID will assess reported issues and determine appropriate follow-up actions, which may include actions ranging from providing additional technical assistance and/or capacity building to activity redesign or cessation. 2) Support to the development of clean energy technologies or projects will be subject to all relevant conditions as established under USAID/Southern Africa’s REGO IEE, available here: http://gemini.info.usaid.gov/egat/envcomp/document.php
<p>Technical assistance, training and capacity building in Climate-Smart agriculture techniques, including potential for direct or indirect support to small-scale irrigation (<5 hectares) and/or introduction of new small-scale irrigation (<5 hectares) technologies and strategies</p>	<p>Negative determination, subject to the following condition:</p> <ol style="list-style-type: none"> 1) Training and direct technical assistance for Climate-resilient/Climate-Smart Agriculture interventions will adopt all relevant conditions for general agriculture interventions as established in USAID/Southern Africa’s IEE for its REGO office, available here: http://gemini.info.usaid.gov/egat/envcomp/document.php 2) The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at http://www.usaidgems.org/Documents/ComplianceForms/AFR/AFR-EnvReviewForm-20Dec2010.doc) must be completed and approved by the COR/AOR, MEO and REA prior to construction or rehabilitation of irrigation systems. 3) The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF; and, 4) The environmental management conditions established by the ERF process must be generally consistent with the

	<p>conditions small-scale irrigation enumerated immediately above and, at minimum, consistent with the criteria established in USAID’s Sector Environmental Guidelines for each of Agriculture and Forestry.</p> <p>5) Small-scale irrigation projects and strategies must be appropriately integrated into broader integrated water resource management planning being conducted by host-country, regionally, and in line with internationally recognized standards and best practice.</p>
<p>Technical assistance, training, and capacity building for medium- or large- scale irrigation activities (i.e., larger than 5 hectares).</p>	<p>Deferral.</p> <p>Irrigation activities of scale larger than 5 hectares must be reviewed and further environmental analysis submitted to the Mission and BEO for approval.</p>

3.7 Intervention Category 4: Technical assistance and Infrastructure development to improve Water, Sanitation and Hygiene (WASH) access and behaviors

Entailed Activities

This intervention category consists of the following activities:

- Construction or rehabilitation of small-scale water and sanitation infrastructure intended to increase first time access to sustainable water supply and improved sanitation. This may include boreholes, pipeline extension, water tanks, shallow wells and latrines
- Capacity-building for equipment/system maintenance
- Social and behavior change communication (SBCC) to increase adoption of key positive hygiene behaviors
- Strengthen institutional capacity for WASH
 - Capacity building for relevant institutions/individuals in implementation and oversight of WASH activities
 - Studies/analyses to track need and effectiveness
- Water supply infrastructure activities equal to or greater than a total investment in a given community of \$250,000

Potential Adverse Impacts & Considerations Regarding Recommended Determinations.

In general, well-executed water and sanitation interventions bring substantial health and environmental benefits. However, for many activities, active efforts are required to prevent unintended adverse impacts that can offset or negate these benefits:

Point of use water treatment presents strong benefits if required treatment levels and procedures are followed. Health risks related to excessive dosing of water are minimal; the risk is rather of under-treatment and re-contamination that renders the POU treatment ineffective. Further, appropriate dilution/dosage is the major focus of the intervention. There is thus no contraindication to the categorical exclusion for which health care activities are eligible.

Wells, boreholes, and water supply systems. In operation, wells, bore holes and small water systems can:

1. Deplete groundwater when abstraction exceeds replenishment of groundwater resource.
2. Create stagnant (standing) water in the vicinity of the water supply point and creation of diseases vectors breeding sites (mosquitoes, risks of contamination of fetched water, foot infection of water point users, seepage in and contamination of the wells, etc.)
3. Create human health risks from provision of biologically or chemically contaminated water. Even if water is not contaminated initially, it can become so thru flooding, failure to exclude livestock from the water point, use of contaminated containers to draw water from hand-dug wells, and other factors.
4. Lead to human health risks from contamination of water fetched from the water points to the end users (arising from contamination of containers, mishandling, etc.).

However, for small-scale interventions, these impacts can be controlled below the level of significance by appropriate siting, water quality assurance protocols (including testing), design (including drainage and exclusion of livestock from water points) and maintenance. With respect to the last, capacity-building in equipment/system maintenance is an essential corollary to construction/installation of small-scale water supplies.

Finally, construction with burnt brick poses particular concerns in some countries; see section 3.8 for details about 1) risks entailed for construction activities, generally and 2) risks associated with the promotion/use of burnt bricks. Even small-scale uses of burnt brick for water supply (e.g. well enclosures, water towers, etc.) should be avoided.

Latrines/Small-scale Sanitation. In operation, latrines can contaminate shallow groundwater and wells and, when not well maintained or of an open-pit design, they can also be the source of multiplication of flies, mosquitoes, spread of diseases, and foul odors.

More specifically, poorly designed sanitation facilities can lead to insect-borne diseases: There are two groups to consider. Firstly, *culex* mosquitoes, which do *not* transmit malaria but can transmit filariasis, breed extensively in septic tanks and flooded latrines. Secondly, flies and cockroaches often thrive on excreta and have been implicated in some transmission of faecal-oral disease. Mosquitoes, flies, and cockroaches all constitute a great nuisance, and poor urban households have consistently been shown to spend substantial amounts of their scanty household income on using control coils and nets.

However, for small-scale interventions these impacts can be controlled below the level of significance by appropriate siting, design, and maintenance. With respect to the last, capacity-building in equipment/system maintenance is an essential corollary to construction/installation of small-scale sanitation.

Social marketing/education/outreach/community mobilization on hygienic water handling/storage, hand-washing, use of sanitation facilities (CLTS---community-led total sanitation) and the importance of protecting water supplies is, like system and equipment maintenance, an essential corollary to construction and installation of small-scale water and sanitation infrastructure. Experience shows without behavior change, the physical infrastructure will not be used or maintained.

Recommended Determinations. Per the above analysis, the following threshold determination is recommended for activities in this intervention category:

Activity or intervention sub-category	Recommended Determination
<p>Construction or rehabilitation of small-scale water and sanitation infrastructure intended to increase first time access to sustainable water supply and improved sanitation. This may include boreholes, pipeline extension, water tanks, shallow wells and latrines</p>	<p>Negative Determination Subject to Conditions per 22 CFR 216.3(a)(2)(iii), is recommended for small-scale wat/san infrastructure activities (defined as isolated wells, boreholes and latrines such that the total investment in a given community is less than \$250,000). The conditions are as follows:</p> <ol style="list-style-type: none"> 1. Good-practice design standards must be implemented for new construction and rehabilitation works, generally consistent with USAID’s <i>Sector Environmental Guidelines for Water Supply & Sanitation</i>. These standards must be specified in the EMMP (see Section 4 of this IEE). <ul style="list-style-type: none"> ● For water supply, they must include siting of new wells well away from groundwater contamination sources (e.g. latrines, cesspits, dumps), exclusion of livestock from water points, and prevention of standing water at water supply points. ● For latrines, they must include provisions to prevent contamination of water supplies, appropriate choice of latrine type given local environmental conditions (e.g. pit latrines are rarely suitable in locations where the water table is high), provision of handwash stations, and development and implementation of a system for ongoing latrine cleaning and maintenance ● No burnt brick. Burnt brick shall not be used as a primary construction material. Limited use of burnt brick when alternatives are not feasible or suitable is permitted. 2. Capacity-building in equipment/system maintenance must be co-programmed with construction/installation of small-scale sanitation infrastructure. 3. Water quality assurance plan. Prior to drinking water provision, the project will prepare and receive approval for a Water Quality Assurance Plan (WQAP). The WQAP will be prepared in consultation with the cognizant AOR/COR and/or Activity Manager. Its purpose is to ensure that all new and rehabilitated USAID-funded sources of drinking water provide water that is safe for human consumption. The completed WQAP must be approved by: the AOR/COR and/or Activity Manager; the MEO; and the REA.
<p>Capacity-building for equipment/system maintenance</p>	

	<ul style="list-style-type: none"> ● Once approved, the WQAP must be implemented in full, and for the duration of drinking water activities. Implementation must include testing of water <u>prior</u> to making the supply point available to beneficiaries. ● The WQAP constitutes a key element of the project’s EMMP. As with all other elements of the EMMP, project budgets, workplans, and staffing plans must provide for its full implementation. The approved WQAP must include at minimum the following sections: <ul style="list-style-type: none"> ○ Project information (name of project, name of IP, period of performance, contact information, name of COR/AOR) ○ A description of the drinking water points to be subject to the WQAP (approximate numbers, water source(s), technology (ies), general geographic area and installation context). ○ An inventory of applicable water quality standards, including those promulgated by USAID, as well as the cognizant host-country regulatory entity/entities. (The World Health Organization [WHO] <i>Guidelines for Drinking-water Quality</i> may be substituted for host-country standards that are not accessible, unclear or outdated.) ○ The responsible parties/entities/institutions, under host country law or policy, for monitoring and managing water quality of the water points subject to this WQAP. If other than the IP, a summary assessment of their capacity and their involvement. ○ A technical assessment of the equipment, resources and expertise that will be required to monitor and report on compliance with applicable water quality standards. This should include, for example, sampling materials, reagents, transportation, storage, laboratory facilities and capacity, communications, training or certification criteria, etc. ○ Protocol for initial testing and ongoing monitoring of water quality, to include: <ul style="list-style-type: none"> ▪ contaminants for which initial testing and ongoing monitoring will be conducted
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	<ul style="list-style-type: none"> ▪ water quality assessment methods, including test type and frequency ▪ data management and reporting; the project must maintain a central registry of monitoring results by water point and date; GPS coordinates for water points are expected ▪ designation of ‘responsible party’ for each aspect of protocol ▪ response procedures in the event water does not meet water quality standards <ul style="list-style-type: none"> ○ Justification for NOT testing to any applicable standard ○ Sustainability strategy to the extent that responsibility for longer-term water quality assurance will transition in part or whole to project partners or beneficiaries. A summary assessment of the capacity of these partners, and any capacity building to be undertaken <ul style="list-style-type: none"> ● The WQAP should follow any applicable USAID guidance, as well as local laws, regulations and policies.
<p>Social and behavior change communication (SBCC) to increase adoption of key positive hygiene behaviors</p>	<p>Categorical Exclusion, per §216.2(c)2</p> <ul style="list-style-type: none"> ● (i) Education, technical assistance, or training programs; ● (iii) Analyses, studies, academic or research workshops and meetings; ● (v) Document and information transfers; and
<p>Strengthen institutional capacity for WASH through:</p> <ul style="list-style-type: none"> ○ capacity building of relevant institutions/individuals in implementation and oversight of WASH activities ○ Studies/Analyses to track need and effectiveness of WASH activities 	
<p><u>Water and sanitation infrastructure</u> other than very small scale (defined as piped community water supplies, or any investment in water and sanitation infrastructure exceeding \$250,000 in a single community)</p>	<p>Deferral</p>

3.8 Intervention Category 5: Infrastructure development to support biodiversity conservation, natural resource management, watershed and/or fishery management, or low-emissions development.

Entailed activities. This intervention category consists of the following activities:

- Small-Scale Construction (not including WASH)
- Small-Scale Road Rehabilitation
- Infrastructure development on or near wetlands, mangroves, coastal areas, and/ or protected areas

Potential Adverse Impacts & Considerations Regarding Recommended Determinations.

Small-scale construction. Construction itself has a well-known set of potential adverse impacts. Experience shows that these impacts are controllable below the level of significance with basic good construction management practices, including occupational safety and health practices.

- *Disturbance to existing landscape/habitat.* Construction typically necessitates clearing, grading, trenching and other activities that can result in near-complete disturbance to the pre-existing landscape/habitat within the plot or right-of-way. If the plot or right-of-way contains or is adjacent to a permanent or seasonal stream/water body, grading and leveling can disrupt local drainage. Furthermore, when construction occurs in a waterbody (for example, pier construction), acute and chronic construction-related impacts related to noise, turbidity, and construction activity may adversely affect local species and habitats.
- *Sedimentation/fouling of surface waters.* Runoff from cleared ground or material stockpiles during construction can result in sedimentation/fouling of surface waters, particularly if the site is located in close proximity to a stream or water body.
- *Standing water.* Construction may result in standing water on-site, which readily becomes breeding habitat for mosquitoes and other disease vectors; this is of particular concern in the parts of Kenya where malaria is endemic.
- *Occupational and community health and safety hazards.* The construction process and construction sites present a number of hazards: fall and crush injuries, hazards from hand or power tools and equipment used in construction, and exposure to hazardous substances, such as solvents in paint, cement dust, etc.
- *Increased Air and Noise Pollution* can result during construction or rehabilitation from the actions of construction equipment and workers.
- *Adverse impacts of materials sourcing.* Construction requires a set of materials often procured locally: timber, fill, sand and gravel, and bricks. Unmanaged extraction of these materials can have adverse effects on the environment. For example, stream bed mining of sand or gravel can increase sedimentation and disturb sensitive ecosystems; purchase of timber from unmanaged or illegal concessions helps drive deforestation.)

While IPs generally have direct control over their general contractors, construction materials are often procured by general contractors from sub-vendors. In the case of timber, these sub-vendors are often the terminus of a long and untraceable supply chain.

This separation from source both limits the actions that IPs can take to assure environmentally responsible sourcing of these materials and reduces IP responsibility for these impacts – the exception is burnt bricks, for which the impacts can be avoided by requiring use of an alternative material. It should also be noted that for the relatively small construction projects anticipated under this portfolio, adverse impacts related to materials sourcing should be quite limited. However, IPs can and should undertake reasonable due diligence to assure that they do not bear direct responsibility for adverse impacts, and to reduce indirect impacts so far as feasible.

Impacts of facilities in operation. In operation, general/institutional facilities and compounds generate a set of waste streams (e.g. gray water, latrine discharge, solid waste). In general, if improperly managed, such wastes can contaminate ground and surface water, negatively impact aquatic and marine ecosystems, create breeding habitat for disease vectors, etc.

- *Drainage.* Failure to design or maintain appropriate drainage structures can result in standing water within the compound or on adjacent lands. Local erosion, including damage to adjacent fields, and sedimentation of nearby surface waters can also result. Improper drainage may also cause increased pollutant loads to receiving waterbodies producing an adverse environmental impact.
- *Operation of latrines and pit/tanks.* If latrine design or a maintenance failure permits insects or other disease vectors free in-and-out access to the pit/tank, pathogens in human waste can be spread within the compound and to the nearby community. Similarly, spilling latrine waste during pump-out releases contained pathogens into the environment. Storing solid waste (usually a mixture of food scraps, packaging, and paper) in open containers creates breeding habit for and attracts disease vectors such as rodents.
- *Storage of agrochemicals* presents risks of leaks, which may reach ground or surface waters and fires. Structures must, among other characteristics have impermeable floors and appropriate ventilation. The requirements established by PMI for pesticide storage facilities should be followed (http://www.pmi.gov/docs/default-source/default-document-library/tools-curricula/bmp_manual_aug10.pdf?sfvrsn=4).

Small-scale road rehabilitation.

- *Roads share in full measure the general construction impacts discussed above.* Due to the volume of material used and the large total disturbed area, road borrow pits/materials sourcing present special concerns, as do the potential for sedimentation of surface waters and disruptions to drainage patterns. Road machinery is among the more hazardous equipment used on construction sites.
- Once a road has been completed, increased traffic can bring with it more noise as well as additional adverse social impacts (i.e. increased crime, spread of communicable diseases, etc.)

In the absence of complicating factors,⁵² USAID AFR Bureau has concluded that very small-scale general rehabilitation of rural roads (i.e. involving a total of less than 10 km) is of its nature unlikely to create

⁵² Complicating factors include, e.g. siting within 30m of a permanent or seasonal stream or water body, or displacement of existing settlement/inhabitants, or building on an average slope in excess of 5%, or building on a site that is heavily forested or in an otherwise undisturbed local ecosystem.

significant adverse impacts of any kind. Rehabilitation larger than this scale (or construction of new roads of any size) does typically present the risks that the impacts described above could be significant.

Infrastructure development on/near wetlands, mangroves, coastal areas, and/or protected areas.

Road rehabilitation and construction share the full measures of impacts discussed above, but also carry other significant environmental considerations when conducted in or around wetlands, mangroves, coastal and/or protected areas. These areas are typically home to significant biodiversity and/or sensitive ecosystems and infrastructure development can damage the natural resources and benefits they provide. For wetlands, mangroves and coral reefs, ecosystem services such as flood control, water filtering, food production, nursery grounds for fisheries, and storm protection can be affected. Protected areas also offer significant ecosystem services, and negative environmental impacts can affect tourism and employment (and, as a result, economic growth). Further, roads can accidentally transport invasive species to these areas, or cause significant damage to wetlands when multiple track development occurs when drivers try to avoid standing water on the road surface. Draining wetlands for the purpose of road rehabilitation can also release greenhouse gases into the atmosphere.

Activity or intervention sub-category	Recommended Determination
<p>Rehabilitation of existing facilities or construction of facilities with a total surface area disturbed of less than 1000 m² (NOT on/near protected areas or wetlands)</p>	<p>Negative Determination subject to the following conditions:</p> <p>1. No complicating factors. The site is not within 30m of a permanent or seasonal stream or water body, will NOT involve displacement of existing settlement/inhabitants, has an average slope of less than 5% and is not heavily forested, in an otherwise undisturbed local ecosystem, or in a protected area. Sites violating one or more of these criteria are subject to the determinations and conditions in the next listed activity, immediately below.</p> <p>2. Construction will be undertaken in a manner generally consistent with the guidance for environmentally sound construction, provided in the USAID <i>Sector Environmental Guideline</i> for Construction. At minimum, (1) During construction, prevent sediment-heavy run-off from cleared site or material stockpiles to any surface waters, coastal areas, or fields with berms, by covering sand/dirt piles, or by choice of location. (Only applies if construction occurs during rainy season.); (2) Construction must be managed so that no standing water on the site persists more than 4 days; (3) IPs must require their general contractor to certify that it is not extracting fill, sand or gravel from waterways or ecologically sensitive areas, nor is it knowingly purchasing these materials from vendors who do so; (4) IPs must identify and implement any feasible measures to increase the probability that timber is procured from legal, well-managed sources.</p> <p>3. Asbestos. If the presence of asbestos is suspected in a facility to be renovated, the facility must be tested for asbestos before rehabilitation works begin. Should asbestos be present, then the work must be carried out in conformity with host country requirements, (if any) and in</p>

	<p>conformity with guidance to be provided by the MEO, in consultation with the REA. All results of the testing for asbestos shall be communicated to the C/AOR.</p> <p>4. Paint. No lead-based paint shall be used, when lead-free paint is used, it will be stored properly so as to avoid accidental spills or consumption by children; empty cans will be disposed of in an environmentally safe manner away from areas where contamination of water sources might occur; and the empty cans will be broken or punctured so that they cannot be reused as drinking or food containers.</p> <p>5. Water supplies. Where water supplies for drinking or other uses are upgraded or provided, the conditions of Intervention Category 4 applying to water supplies also apply.</p> <p>6. Waste handling equipment and infrastructure. USAID intervention must result in the facilities' possessing adequate provision for handling the wastes they may generate; including human wastes. Sanitation facilities are subject to the conditions of Intervention Category 4 applying to latrines.</p> <p>8. Facilities intended for storage of pesticides must conform to the requirements for such facilities set out in the PMI Best Management Practices Manual. (http://www.pmi.gov/docs/default-source/default-document-library/tools-curricula/bmp_manual_aug10.pdf?sfvrsn=4).</p>
<p>Rehabilitation of existing facilities or construction of facilities in which the total surface area disturbed is less than 1000 m²;</p> <p>-AND-</p> <p>Presence of complicating factors.* (NOT on/near protected areas or wetlands)</p>	<p>Negative Determination subject to the following conditions</p> <ol style="list-style-type: none"> 1. The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at http://www.usaidgems.org/Documents/ComplianceForms/AFR/AFR-EnvReviewForm-20Dec2010.doc) must be completed and approved by the COR/AOR, MEO and REA prior to construction. 2. The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF; and, 3. The environmental management conditions established by the ERF process must be generally consistent with the conditions for “very small scale construction” enumerated immediately above and, at minimum, consistent with achieving a “no issues” result under application of the Visual Field Guide for Small-Scale Construction.
<p>Rural Feeder Road Rehabilitation of LESS THAN 10 KM per</p>	<p>Negative Determination subject to the following conditions:</p> <ol style="list-style-type: none"> 1. The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at

<p>segment (NOT on/near protected areas or wetlands)</p>	<p>http://www.usaidgems.org/compliance.htm) must be completed and approved prior to construction or rehabilitation of each site/system. The ERF must specifically address the potential impacts identifies in the above analysis of this activity.</p> <p>2. General consistency with USAID Sector Environmental Guidelines. The environmental management conditions established by the ERF process must be generally consistent with good-practice guidance of USAID’s <i>Sector Environmental Guidelines</i> for Rural Roads.</p> <p>3. The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF.</p>
<p>Infrastructure development (small-scale construction/ rehabilitation or rural road rehabilitation) on or near protected areas</p>	<p>Negative Determination subject to the following conditions:</p> <p>1. The formal AFR ESF/ERR subproject/subgrant review process, as set out by the AFR Environmental Review Form (available at http://www.usaidgems.org/compliance.htm) must be completed and approved prior to construction or rehabilitation of each site/system. The ERF must specifically address the potential impacts identifies in the above analysis of this activity.</p> <p>2. General consistency with USAID Sector Environmental Guidelines. The environmental management conditions established by the ERF process must be generally consistent with good-practice guidance of USAID’s <i>Sector Environmental Guidelines</i> <i>Sector Environmental Guidelines</i> for Rural Roads and Construction.</p> <p>3. The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF.</p>
<p>Infrastructure development (small-scale construction or rehabilitation or rural road rehabilitation) on or near wetlands, mangroves, coastal areas, and/or protected areas.</p>	<p>Deferral</p>

3.9 Intervention Category 6: Facilitation, Promotion and/or Provision of Financing Instruments and Access to credit

Activities that address credit constraints and facilitate access to credit include:

A. FACILITATING INVESTMENT AND ACCESS TO CREDIT

- Assessment and analysis of existing loan guarantee mechanisms
- Establishing linkages with the Development Credit Authority (DCA) and support risk mitigation for biodiversity conservation, watershed management, or other related lending by leveraging DCA.
- Facilitating public/private sector partnerships, including use of the DCA, Global Development Alliances (GDA)
- Capacity building and training for financial institutions offering biodiversity conservation, natural resource management, global climate change adaptation, or eco-tourism lending.
- Expanding the number of banks and financial institutions including Micro-finance Institutions (MFI) engaged in NRM and biodiversity conservation lending (e.g., support to community conservation groups, or eco-tourism ventures) by leveraging DCA
- Introducing financial instruments such as agro-forestry insurance
- Support private sector and civil society investment in biodiversity conservation or eco-tourism infrastructure through GDA and other PPPs

Activities of entities supported by transfers of USAID funds through provision of credit, sub-awards, subcontracts, or other financial instruments are subject to this IEE provisions and conditions.

The [design of DCA guarantees and the program contexts in which they are used are very diverse](#). Reg. 216 documentation and compliance requirements must be specific to the particular DCA activities. It is not possible to devise “boilerplate” language covering every permutation and situation. The situations in which DCA credit guarantees are used must often be adapted to reflect the design and context of particular DCA activities. Thus, it is important to understand the basic principles that apply to the choice of recommended determinations and design of conditions.

B. USE OF FINANCING INSTRUMENTS

- Provision of sub-grants to international and national partners
- Employing contractors and sub-contractors
- Direct lending or provision of grants to eco-tourism businesses, biodiversity conservation SMEs, small-holder farmers adopting climate-smart agriculture practices, or other businesses or individuals otherwise engaged in NRM and biodiversity conservation practices.

Potential adverse impacts & considerations regarding recommended determinations

Activities that include assessments and evaluations, establishing linkages, negotiations, documents transfer, training and capacity building do not present foreseeable adverse impacts on the environment.

Financial support provided to a variety of biodiversity conservation, NRM, eco-tourism, and related businesses will have direct and indirect impacts associated with management and use of natural resources as discussed in subsequent sections. Examples of such support are awarding sub-contract for development of an eco-lodge, or creation of small-scale fisheries, issuing sub-award for training beneficiaries on fishery management, providing grants for research activities, and other activities.

The objective of the DCA activity is to **Increase access to finance in the Environment and Natural Resources Management SME** sector described above. Many practices by these SME entities in Southern Africa are not always environmentally sound and that “business as usual” in the sector could result in adverse impacts. Enhanced access to capital by Small and Medium Enterprise actors is likely to increase the scale of existing environmental problems and problematic practices. Southern Africa countries’ current regulatory capacity/land management regime may not be sufficient to manage these issues.

USAID thus has a dual responsibility: (1) to ensure that financial intermediaries receiving DCA credit guarantees have functional environmental due diligence processes in place for their DCA-supported loans that (a) enforce requirements of the “standard language,” and beyond this, (b) compliance with host country requirements; and (2) to provide complementary technical assistance (TA) to entities receiving DCA-backed loans to support compliance and good practice.

To mitigate these issues, DCA LPGs include the standard language (Appendix A) that withholds DCA credit guarantees’ coverage from environmentally “high risk” activities (i.e., cases where Reg. 216 requires an EA and activities restricted by sections 118 & 119 of the Foreign Assistance Act), except with USAID prior review and approval. That is, if such a loan is made without first obtaining USAID approval, DCA will provide no coverage in case of default. This provision sends a clear message to financial intermediaries and borrowers regarding the importance of environmental due diligence. It also provides important legal protection for USAID. However, it may not be sufficient for purposes of environmental good practice or compliance.

As a result, to mitigate potential adverse environmental impacts, USAID/Southern Africa will:

- a. ensure that financial intermediaries receiving DCA credit guarantees have functional environmental due diligence processes in place for their DCA-supported loans that enforce requirements of the “standard language,” and beyond this, compliance with host country requirements; and
- b. provide complementary TA to entities receiving DCA-backed loans to support compliance and good practice. The nature of the TA, which is managed through the USAID/Southern Africa mission, will be led through a multi-donor initiative and implemented through IFC, and the scope of such assistance (which includes engagement on both bank and borrower sides), will be available on request from USAID/Southern Africa.

Recommended Determinations: Per the above discussion, the following determinations are recommended:

Activity	Recommended Determination
Facilitating access to investment and credit	Categorical Exclusion is recommended per 22 CFR 216.2(c)(2)(i), (iii) and (v) for evaluations, assessments, information transfer, training and capacity building.
Use of financing instruments, incl. GDAs, but not including DCAs	<p>Negative determination, subject to the following conditions:</p> <p>All anticipated fund transfers by organizations receiving USAID funds in the form of loans, equity investment, sub-awards and sub-contracts must reflect the environmental compliance requirements and documentation prepared in accordance with Regulation 216. For all sub-contracted activities, the sub-awardee(s) is/are subject to conditions of this IEE. The IP must provide the sub-awardee(s) a copy of this IEE and where necessary provide training to improve sub-awardee(s) core knowledge of pollution prevention and environmental compliance.</p> <ul style="list-style-type: none"> • All financing institution supported directly or indirectly with USAID funds must ensure application/implementation of the appropriate terms and conditions to meet the environmental compliance requirements of the prime award. • The IP must communicate and ensure application/implementation of the appropriate terms and conditions to meet the environmental compliance requirements of the prime award. • Entities considered for financial assistance or substantial TA in the areas of natural resource management, fishery management, eco-tourism, irrigation, climate smart agriculture, and construction must first undergo an initial environmental, health and safety review of their operations for general soundness and compliance with host country requirements. This assessment must be the basis for compliance commitments and supportive TA as required above. Assessments must be updated following conclusion of assistance. All such assessments must be maintained in project files and summaries in quarterly or 6-month project environmental compliance reporting. • The formal AFR ESF/ERR subproject/subgrant review process, as

	<p>set out by the AFR Environmental Review Form (ERF) available at http://www.usaidgems.org/Documents/ComplianceForms/AFR/AFR-EnvReviewForm-20Dec2010.doc) must be completed and approved by the COR/AOR, MEO and REA prior to implementation of activities.</p> <p>The IP must assure implementation of any mitigation and monitoring conditions specified by the approved ERF.</p> <p>Mandatory reference</p> <p>The instructions and the form can be found, under “Subsidiary Review,” at the following web site: http://www.usaidgems.org/subsidiary.htm.</p> <p>Global Development Alliance Activities (GDAs). USAID’s environmental procedures apply to all GDAs. They apply slightly differently to pooled resources vs parallel financing.</p> <ul style="list-style-type: none"> • Factsheet: Environmental Compliance for Global Development Alliance Activities. <p>Note: Categorical Exclusion is recommended per 22 CFR 216.2(c)(2)(vi) and (x) where contributions are made to international, regional or national organizations which are not for the purpose of carrying out a specifically identifiable project or projects; and support for intermediate credit institutions when the objective is to assist in the capitalization of the institution or part thereof and when such support does not involve reservation of the right to review and approve individual loans made by the institution.</p>
<p>DCA Loan Portfolio Guarantees</p>	<p>Negative Determination is recommended pursuant to 22 CFR 216.3(a)(2)(iii) for the Commitment Agreement (DCA) and the Loan Agreement (LPG) intended to increase the Borrower’s access to loans for expansion of its ENRM/CC activities in Southern Africa, subject to the conditions that:</p> <ol style="list-style-type: none"> The Guaranteed Party will provide a copy of its environmental policies and procedures to USAID for review by the managing team, the Mission Environmental Officer (MEO), and the Regional Environmental Advisor (REA). [This will a standard condition typically committed to in the Guarantee Agreement and the Commitment Agreement, respectively.]

	<p>b) USAID, including the MEO and REA, will evaluate the lender’s environmental policies for sufficiency to ensure compliance with the environmental provisions of the standard language in the Guarantee Agreement.</p> <p>c) If the lender’s capacity is judged, in this evaluation, to be insufficient, USAID/SA will provide for appropriate lender capacity building. This capacity building activity will be designed in coordination with the MEO & REA.</p> <p>d) The USAID/SA REED Office will periodically review the Guaranteed Party’s and the Borrower’s implementation of this requirement, including during project monitoring visits.</p> <p>e) Environmental compliance will comprise one of the performance measures of the project’s mid- and/or end-term technical evaluation to be carried out by the USAID Team responsible.</p> <p>f) The USAID Sector Environmental Guidelines (http://www.usaidgems.org/sectorGuidelines.htm) and the <i>Environmental Guidelines for Small Scale Activities in Africa</i> (www.encapafrika.org/egssaa.htm), specifically Section III on Micro and Small Enterprises, (http://www.encapafrika.org/egssaa.htm#III), will inform compliance with these conditions, and should be considered for use in training of the lender (Guaranteed Party) and appropriate parties.</p>
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4.0 GENERAL IMPLEMENTATION AND MONITORING REQUIREMENTS

In addition to the activity-specific conditions enumerated in Section 3, the negative determinations recommended in this IEE are contingent on full implementation of the following monitoring and implementation requirements:

1. **IP Briefings on Environmental Compliance Responsibilities.** The REED team shall provide each Implementing Partner (hereinafter IP), with a copy of this IEE; each IP shall be briefed on their environmental compliance responsibilities by their C/AOR. During this briefing, the IEE conditions applicable to the IP’s activities will be identified.

2. **Development of EMMP.** Each IP whose activities are subject to one or more conditions set out in Section 3 of this IEE shall develop and provide for C/AOR review and approval of an EMMP documenting how their project will implement and verify all IEE conditions that apply to their activities.

These EMMPs shall identify how the IP shall assure that IEE conditions that apply to activities supported under subcontracts and subgrant are implemented. In the case of large subgrants or subcontracts, the IP may elect to require the subgrantee/subcontractor to develop their own EMMP.

(Note: The AFR EMMP Factsheet provides EMMP guidance and sample EMMP formats: http://www.usaidgems.org/Documents/lopDocs/ENCAP_EMMP_Factsheet_22Jul2011.pdf)

3. **Integration and implementation of EMMP.** Each IP shall integrate their EMMP into their project work plan and budgets, implement the EMMP, and report on its implementation as an element of regular project performance reporting.
4. **Special Monitoring Conditions for DCA Loan Guarantees.** See Section 4.1.
5. **IPs shall assure that sub-contractors and sub-grantees integrate implementation of IEE conditions,** where applicable, into their own project work plans and budgets and report on their implementation as an element of sub-contract or grant performance reporting.
6. **Integration of compliance responsibilities in prime and sub-contracts and grant agreements.**
 - a. The REED team shall assure that any future contracts or agreements for implementation of activities covered by this IEE, and/or significant modification to current contracts/agreements shall reference and require compliance with the conditions set out in this IEE, as required by ADS 204.3.4.a.6 and ADS 303.3.6.3.e.
 - b. IPs shall assure that future sub-contracts and sub-grant agreements, and/or significant modifications to existing agreements, reference and require compliance with relevant elements of these conditions.
5. **Assurance of sub-grantee and sub-contractor capacity and compliance.** IPs shall assure that sub-grantees and subcontractors have the capability to implement the relevant requirements of this IEE. The IP shall, as and if appropriate, provide training to subgrantees and subcontractors in their environmental compliance responsibilities and in environmentally sound design and management (ESDM) of their activities.
6. **REED team monitoring responsibility.** As required by ADS 204.3.4.b.(1), the REED team will actively monitor and evaluate whether the conditions of this IEE are being implemented effectively and whether there are new or unforeseen consequences arising during implementation that were not identified and reviewed in this IEE. If new or unforeseen consequences arise during implementation, the team will suspend the activity and initiate appropriate, further review in accordance with 22 CFR 216. USAID Monitoring shall include regular site visits.
7. **New or modified activities.** As part of its Work Plan, and all Annual Work Plans thereafter, IPs, in collaboration with their C/AOR, shall review all on-going and planned activities to determine if they are within the scope of this IEE.
If activities in the Environment, Natural Resources and Climate Change Management Program portfolio outside the scope of this IEE are planned, the REED team shall assure that an amendment to this IEE addressing these activities is prepared and approved prior to implementation of any such activities.

Any ongoing activities found to be outside the scope of the approved Regulation 216 environmental documentation shall be modified to comply or halted until an amendment to the documentation is submitted approved.

8. **Compliance with Host Country Requirements.** Nothing in this IEE substitutes for or supersedes IP, subgrantee and subcontractor responsibility for compliance with all applicable host country laws and regulations. The IP, subgrantees and subcontractor must comply with host country environmental regulations unless otherwise directed in writing by USAID. However, in case of conflict between host country and USAID regulations, the latter shall govern.

4.1 Special Monitoring Conditions for DCA Loan Guarantees

The Guaranteed Party(ies) (lenders, financial institutions) are not strictly implementing partners of USAID. Normally the engagement with USAID ends at the guarantee stage, other than the flow of funds, and monitoring. Thus, the financial institutions cannot be expected to produce an EMMP. Environmental and technical monitoring will be provided via the Mission as well as other assistance to promote environmental compliance, as appropriate. The guaranteed party will submit their environmental review procedures to USAID for review, as a standard Condition Precedent of the Loan Guarantee Agreement.

The guaranteed lenders do not receive direct funding from USAID. Key is what is required in the DCA legal agreement, which is negotiated and signed by the lender. The legal agreements include only standard DCA environmental requirements, restricting lending to environmentally sensitive sectors and a requirement to provide a copy of their environmental policies for USAID approval as a “condition subsequent” to utilization.

Environmental monitoring compliance will be one of the performance measures of the project’s mid- and/or end-term technical evaluation, to be carried out by the USAID sectoral management Team.

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