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GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

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PART I: Project Information

Project Title:	Management of competing water uses and associated ecosystems in Pungwe, Busi and Save Basins		
Country(ies):	Mozambique and Zimbabwe	GEF Project ID: ¹	9593
GEF Agency(ies):	IUCN	GEF Agency Project ID:	
Other Executing Partner(s):	Ministry of Public Work, Housing and Water Resources of Mozambique and the Ministry of Environment, Water and Climate Change of Zimbabwe	Submission Date:	25 July 2016
GEF Focal Area(s):	International Waters	Project Duration (Months)	48
Integrated Approach Pilot	IAP-Cities <input type="checkbox"/> IAP-Commodities <input type="checkbox"/> IAP-Food Security <input type="checkbox"/>	Corporate Program: SGP <input type="checkbox"/>	
Name of parent program:	[if applicable]	Agency Fee (\$)	540,000

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES²

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	Trust Fund	(in \$)	
		GEF Project Financing	Co-financing
<u>IW1 Program 1</u> : Foster Cooperation for Sustainable Use of Transboundary Water Systems and Economic Growth	GEFTF	2,357,000	8,000,000
<u>IW 2 Program 3</u> : Advance Conjunctive Management of Surface and Groundwater through Effective Institutional, Legal and Policy Measures	GEFTF	924,000	2,400,000
<u>IW 2 Program 4</u> : Addressing the Water/Food/Energy/Ecosystem Security Nexus	GEFTF	2,719,000	7,000,000
Total Project Cost		6,000,000	17,400,000

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

The Program Development Objective is to strengthen transboundary cooperation and management of water resources and associated ecosystems for improved water security, climate change resilience and sustainable livelihoods in the shared Pungwe-Buzi-Save basins (Zimbabwe and Mozambique)						
Project Components	Financing Type ³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
C-1-Total					1,022,000	2,000,000
Component 1: Integrated basin planning for the Pungwe - Buzi – Save River Basins	TA	Zimbabwe and Mozambique JWC agrees on updated shared water resources Plan for joint, ecosystem based management of the Pungwe-Buzi-Save river basins	Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) developed building on existing Monographs.	GEFTF	383,000	2,000,000
			Pungwe-Save-Buzi Strategic Action		284,000	

¹Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.

²When completing Table A, refer to the excerpts on [GEF 6 Results Frameworks for GETF, LDCF and SCCF](#).

³ Financing type can be either investment or technical assistance.

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Project Components	Financing Type ³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
			Program (SAP) developed building on the TDA and IWRM regional/ national plans & adopted at ministerial level (JWC)			
			Two National Intersectoral teams, established to oversee the TDA/SAP/e-flow processes	GEF TF	180,000	
			Partnership development and donor partners Conference held to raise funds for SAP implementation	GEF TF	100,000	
			Active platform for learning and experience sharing across GEF-IW portfolio and with other GEF-6 relevant transboundary initiatives	GEF TF	75,000	
C-2 Total					2,962,000	8,000,000
Component 2: Flood and Drought Warning and Mitigation	TA	Improved capacity of the JWC and RBOs for integrated management of floods and droughts	Improved Water Resources information system in support of flood and drought Risk Management ⁴	GEF TF	619,000	
			Flood Forecasting and Early Warning Systems improved , including hosting, improving and utilizing hydrological and hydraulic flood zone modeling (flood risk mapping) as well as community level early warning systems. Includes	GEF TF	1,819,000	

⁴ includes strengthening water quantity/quality monitoring .Stations to be co-financed by the two partner states. Letter of commitment for operation and maintenance of the stations required

The Program Development Objective is to strengthen transboundary cooperation and management of water resources and associated ecosystems for improved water security, climate change resilience and sustainable livelihoods in the shared Pungwe-Buzi-Save basins (Zimbabwe and Mozambique)						
Project Components	Financing Type ³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
			implementation of flood mitigation and adaptation interventions in high risk communities			
			Ground Water and drought management mainstreamed into Basin Planning	GEF TF	424,000	
			Operationalisation of data and information sharing and exchange procedures	GEF TF	100,000	
C-3- Total					1,730,000	7,000,000
Component 3: Transboundary environmental flow policy and regulatory framework for the Pungwe-Buzi and Save basins strengthened	TA	Policy and regulatory frameworks ⁵ for e-flow regulation management adopted in the Pungwe-Buzi-Save basins ⁶ . Building on the Pungwe agreement (July 2016)	Policy and regulatory frameworks for e-flow regulation adopted by Zimbabwe and Mozambique nationally (at Ministerial level) ⁷ and jointly in the JWC building on principles of SADC Water Policy (2006) ⁸ .	GEFTF	330,000	7,000,000
		Strengthened Environmental Flow management Framework for improved decision making in the Pungwe and Buzi basins	E- flows Management for selected catchments piloted to enhance the delivery of environmental services.	GEF TF	500,000	
			E-flow operational policies of proposed new/ existing storage infrastructure in the Pungwe –Buzi	GEF TF	400,000	

⁵ This is important because adoption by the JWC without appropriate enabling policy or regulation at national level will mean that there is a significant risk that eflows float as a joint aspiration without national commitments or mandates. In addition, this could also provide the needed link to SUSTAIN (see description below), which is focused on the Zambezi basin and therefore the linkages will occur through policy, legal and institutional changes/strengthening at national level rather than PuBuSa per se. Such linkages will be further detailed and clarified during project preparation.

⁶ Clear policy, legal, and institutional frameworks governing water allocation, water use and/or water rights are required in order to implement e-flow requirements. In the context of managing e-flows, the initial policy decision and the development of a legislative framework must be taken at the highest possible level. However, the ‘on the ground’ implementation will often involve day to day decisions being taken at the sub-national and local levels

⁷

⁸ Includes capacity development of the JWC and RBO (ARA-Centro and Zinwa-Save) in the design/ implementation of e-flow procedures

The Program Development Objective is to strengthen transboundary cooperation and management of water resources and associated ecosystems for improved water security, climate change resilience and sustainable livelihoods in the shared Pungwe-Buzi-Save basins (Zimbabwe and Mozambique)

Project Components	Financing Type ³	Project Outcomes	Project Outputs	Trust Fund	(in \$)	
					GEF Project Financing	Co-financing
			basins agreed etc			
			E-flow operational policies for the mangrove areas in the estuary of the Pungwe –Buzi basins formulated	GEF TF	500,000	
Sub-Total					5,714,000	
Project Management Cost (PMC)				GEF TF	286,000	400,000
Total Project Cost					6,000,000	17,400,000

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
GEF Agency	IUCN (BRIDGE)	Grants	400,000
GEF Agency	IUCN (SUSTAIN)	Grants	1,000,000
Donor Agency	Sweden International Development Agency (Pungwe Programme III)	Grants	15,000,000
Recipient Government	Government of Zimbabwe	In-kind	500,000
Recipient Government	Government of Mozambique	In-kind	500,000
Total Co-financing			17,400,000

D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS ^{a)}

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in \$)		
					GEF Project Financing (a)	Agency Fee (b) ^{b)}	Total (c)=a+b
IUCN	GEFTF	Mozambique	International Waters	(select as applicable)	3000000	270000	3270000
IUCN	GEFTF	Zimbabwe	International Waters	(select as applicable)	3000000	270000	3270000
Total GEF Resources					6,000,000	540,000	6,540,000

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT PREPARATION GRANT (PPG)⁹;

Is Project Preparation Grant requested? Yes No If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: \$150,000					PPG Agency Fee: 13,500	
GEF	Trust	Country/	Focal Area	Programming	(in \$)	

⁹ PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to \$50k for PF up to \$2m (for MSP); up to \$100k for PF up to \$3m; \$150k for PF up to \$6m; \$200k for PF up to \$10m; and \$300k for PF above \$10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

Agency	Fund	Regional/Global		of Funds	PPG (a)	Agency Fee ¹⁰ (b)	Total c = a + b
IUCN	GEF TF	Mozambique	International Waters	(select as applicable)	75,000	6,750	81,750
IUCN	GEF TF	Zimbabwe	International Waters	(select as applicable)	75,000	6,750	81,750
Total PPG Amount					150,000	13,500	163,500

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS¹¹

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	<i>Hectares</i>
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	<i>Hectares</i>
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use and maintenance of ecosystem services	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	<i>3 Number of freshwater basins</i>
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	<i>Percent of fisheries, by volume</i>
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO _{2e} mitigated (include both direct and indirect)	<i>metric tons</i>
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	<i>metric tons</i>
	Reduction of 1000 tons of Mercury	<i>metric tons</i>
	Phase-out of 303.44 tons of ODP (HCFC)	<i>ODP tons</i>
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	<i>Number of Countries:</i>
	Functional environmental information systems are established to support decision-making in at least 10 countries	<i>Number of Countries:</i>

PART II: PROJECT JUSTIFICATION

1) The Global Environmental and/or adaptation problems, root causes and barriers that need to be addressed

Context of the Pungwe-Buzi and Save River basins

Water resources comprise a key economic potential of the Beira corridor. The Beira corridor is surrounded by three main transboundary river basins that are shared between Zimbabwe and Mozambique and these include the Pungwe River Basin, the Buzi River Basin and the Save River Basin. These three river basins are all managed by the Joint Water Commission established between Mozambique and Zimbabwe.

The Beira corridor is an area situated in Central Mozambique. It is a gateway to South-East Africa because of the Beira Port but also the road linking Beira (Mozambique) - Harare (Zimbabwe) – Lusaka (Zambia), the railway making the liaison

¹⁰ PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

¹¹ Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the [GEF-6 Programming Directions](#), will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

between Beira (Mozambique) - Harare (Zimbabwe) – Bulawayo (Zimbabwe) – Lusaka (Zambia), and an oil pipeline linking Mozambique and Zimbabwe from the Beira Port.

The Beira corridor is also a large area with huge agricultural potential. In Mozambique, there are an estimated 10 million hectares of arable land with good soils, climate and access to water. The main sectors of activities involved in the development of the Beira Corridor are: agriculture, mining, forestry and tourism)¹². These sectors are highly demanding on water resources, which are the same time needed for the preservation of ecosystems in both Zimbabwe and Mozambique.

The Pungwe River basin

The Pungwe River Basin is a 400 km long river shared by Zimbabwe and Mozambique. The River drains a total catchment area of 31,151 km² of which 4.7% lies within Zimbabwean territory and 95.3% in Mozambique. It rises below Mount Nyangani in the Eastern Highlands of Zimbabwe and then it flows eastward through the Manica and Sofala provinces in Mozambique. The Pungwe River Basin stretches over two climate types. The western part has a humid mountainous climate in which the mean annual rainfall may be above 2,000 mm, and has a temperature that is significantly lower than in the surrounding non-mountainous areas. In the eastern region near Beira, the climate is classified as tropical-humid. In this region, rainfall is distinctly seasonal with pronounced concentration during the warm season November-April with normally very little precipitation falls between June and October.



The river basin, with its abundant water resources, offers considerable potential for economic growth and development provided problems and constraints on water resources management can be solved. An estimated number of 1.2 million people live along the Pungwe River, flowing through northern and eastern Zimbabwe and central Mozambique. A joint and sustainable management of the common water resources is a prerequisite for health, agriculture and the environment.¹³

The Buzi river basin

The Buzi River Basin has a total catchment area of approximately 28,900 km² out of which about 13% of the basin is part of the Zimbabwean territory while the Mozambican territory covers the remaining 87%. Three major tributaries form the Buzi River Basin; Buzi River, Lucite River and Revue River. These three rivers are shared with Zimbabwe and originate from the western mountains. Of these tributaries the Buzi River has the largest catchment (13,760 km²), thereafter Revue River (8 440 km²) and smallest is the Lucite River (6 670 km²). They flow from the mountainous areas in the western part of the basin in Zimbabwe towards Mozambique in the east and the confluence is the Buzi River, which flows into the Indian Ocean. Altitudes ranges from peaks up to 2,500 meters in the mountains down to the sea level. The eastern parts of the basin are flat plains with low altitude, these areas are prone to flooding during the monsoon season. The basin is dominated by the mountainous regions to the west, and the relatively flat plains in the central and lower regions to the east.



¹² Beira Agricultural Growth Corridor (BAGC) (n.d.). *Beira Agricultural Growth Corridor Investment Blueprint*. AgDevCo. Retrieved from http://www.agdevco.com/sysimages/BAGC_Investment_Blueprint_rpt19.pdf & <http://www.beirainformation.com/provincial-data/tete-province/>

¹³ <http://www.sida.se/English/where-we-work/Africa/Mozambique/examples-of-results/Pungwe-River/>

The most upstream part of Buzi River has an altitude of approximately 1 200 above sea level (m.a.s.l.). Its main tributaries, Lucite and Revue, have an altitude of around 1 500 m.a.s.l., with peaks reaching up to 2 500 m.a.s.l. Confluences of these river occur at an altitude less than 100 m.a.s.l. Major dams in the Buzi River Basin are few and limited to two hydropower dams, explicitly the Chicamba Dam (2,020 Mm³) and the Mavuzi Dam (1.8 Mm³). Both found on the Revue River in Mozambique. Chicamba Dam is the larger of them two, but Mavuzi has a higher capacity for generating power

The Save River Basin

Save River Basin (SRB) is shared by Mozambique and Zimbabwe. The basin has an area of approximately 102,000 km², of which 83% lies in Zimbabwe and 17% in Mozambique. The Basin encompasses a wide range of climatic types ranging from mountainous with higher precipitation in the northeast to drier zones along a north-south gradient, and somewhat more humid and tropical approaching the coast and the Indian Ocean in the east. Rainfall is distinctly seasonal. Precipitation occurs during a hot and wet summer season (November-December to March-April) depending on specific location within the Basin, followed by a cool and dry period (May-August), and subsequently, a hot and dry period (September-November). The Triangle - Chiredzi area is a notable exception with the heaviest rainfall occurring in March instead of December. A variety of vegetation types ranging from bush-, shrub- and grassland dominate the SRB. These cover 38% of the basin area, followed by agriculture at 33%, forest at 26%. If sugar estates are excluded, irrigated agriculture constitutes 0.61%, while 9% of the Zimbabwean part of the Basin is found in protected areas. Mining is also a significant activity in the basin. The Runde Catchment in Zimbabwe is home to the SRB's single largest water user



It is served by an intricate and well developed network of large dams and transmission canal systems. The development of the Runde -Tende and Chipinda Pools will see the area reaching almost its full development potential. The SRB has focused development of large, multipurpose dams in the Save catchments in Zimbabwe and Mozambique.

Natural ecosystems of global significance

The three river systems are determinants to the sustainability of ecosystem of global importance given the benefits they provide in terms of biodiversity, climate change mitigation and adaptation. They are also the basis of the livelihoods of the population within the region.

Pungwe River traverses two national parks of global significance. The first is the Nyanga National Park in Zimbabwe. Downstream in Mozambique, the river is an essential element of the Ngorongosa National Park, which is situated on a flood plain along the Pungwe River. The Pungwe river flows influence the two biodiversity hotspots. The three river systems drain into coastal estuaries which are key to a variety of biodiversity.

Gorongosa National Park. The National Park is located in Sofala Province and spans the southern part of the Rift Valley. It was declared a conservation area in 1960 and covers an estimated area of 3,770 km². Several rivers flow into the park from the mountain and plateau. The Park comprises extensive extensive wetlands that offer a variety habitat for wildlife. The park protects an ecosystem of a complex set of floodplains, open areas of savannah, lush forests and mountain areas with high biodiversity. The park is host to an estimated 500 bird species; herbivores such as imbabala, elande, impala, kudu, gondonga, nyala, oribi, chango, pala pala, waterbuck, bluewildbeest; large number of reptiles, cats, lions, leopards, elephants, buffalos, hippos and crocodiles. The Fauna grows by year and the number of wild animals has increased.

Nyanga National Park (Zimbabwe): The Nyanga National Park is located in Zimbabwe. It lies in the North of the Zimbabwe's Eastern Highlands. It is the home of Mount Nyangani, the highest point in Zimbabwe. The Park has an area of 472 Km². The vegetation of the Nyanga National Park is of the Eastern Zimbabwe Montane forest-grassland mosaic. Some rainforest can be found. The Park registered an important wildlife diversity with species. Predators such as lion, leopard and hyaena are present. Visitors can also see buffalos, kudu, reedbuck, klipspringer and several antelope. The Park is also

known by conservationists for its populations of blue duiker and samango monkeys. The Pungwe River rises at the foot of Nyangani and flows southward into the densely wooded Pungwe Gorge before reaching the famous Mutarazi Falls (762 m).

Eastern African Mangrove Ecoregion: The Buzi River catchment encompasses six ecoregions. These include the East African Mangroves ecoregion located at the mouth of the Buzi Estuary with a link to the Pungwe River Estuary, which is listed within the Global 200 priority ecoregions for conservation, and is listed as critical or endangered. Over time, increasing human pressures have led to the degradation of the wetland ecosystem through pollution and land use change. For instance, drainage from irrigated fields and poorly treated urban and industrial waste water pollutes the delta threatening aquatic biodiversity. Maintenance of adequate water flows from both Buzi and Pungwe rivers is of significant importance for the maintenance of this key ecosystem.

Estuaries: Looking at Coastal aspects, one has to consider the estuaries of the rivers. In fact, a change in the flows of each of the river could have a drastic change in the ecosystem of their respective estuary with sinking delta areas, and salt water intrusion. It is therefore important to maintain the river flows in the perspective of stabilizing the estuaries and their ecosystems.

Environmental issues in the Pungwe, Buzi and Save Basins

The environmental issues identified in the above mentioned basins can be summarized as follows:

Deforestation and land degradation : Forests resources are highly solicited for the production of charcoal for domestic energy consumption. This has led to a high level of soil erosion on the watersheds. Consequently, sediments are driven downstream leaving highly degraded land behind. Deforestation, increasing areas of farmland, urbanization, pollutants in both surface and sub-surface water bodies, poor land use practices (eg: artisanal mining but also smallholder agriculture) and so on, all influence the timing and quantities of flows and are having a huge impact on the quality and quantity of freshwater. Changes in land use could significantly alter the availability of water in the three basins; for example, deforestation has an impact on surface water availability and quality. Likewise, land cover depends on continued water availability; for example, forests are dependent on groundwater. Deforestation also results in increased sediment loads, with various impacts on downstream and coastline habitats (estuaries). Maintaining the extent and healthy functioning of ecosystems should be an integral part of dealing with water security issues in the three basins.

Floods: Apart from the major threat of climate change, alterations to land use within the basin can affect the magnitude and frequency of floods. Spatial and temporal variability of rainfall in the three basins result in an uneven spatial distribution of water supply. Variations in seasonality and the episodic nature of rainfall and evapotranspiration all contribute to temporal incongruities that show up as flooding, seasonal low flows, challenging water managers in the Pungwe-Save-Buzi basins to forecast conditions and specify water allocations under a cloud of uncertainty. Flooding also frequently has devastating effects, particularly in areas with high population density and without adequate early warning and emergency response systems in Mozambique. The Mozambique floods of 2000 caused a 23% reduction in GDP and a 44% rise in inflation (WWDR 3). Improving water management would help the two partner states to reduce the damage of climate variability and the extreme events that can cripple economies.

Droughts: Droughts are undoubtedly the most far-reaching of all natural disasters, in the three basins. Drought risks are only partly associated with deficient or erratic rainfall. Instead, they are primarily triggered by a range of drivers that include poverty and rural vulnerability; increasing water demand due to urbanization, industrialization and the growth of agrobusiness; poor water and soil management; weak or ineffective governance; and climate change. Unlike the risks associated with floods, drought risks in the southern Africa region remain poorly understood. Drought losses and impacts are not systematically captured, standards for measuring drought hazard have only recently being introduced, and data collection constraints make it difficult to accurately model risk in many locations.

Meteorological drought is an endemic phenomenon of the region, causing substantial socio-economic hardships, possible decline in public health on a large scale, land degradation and biodiversity loss. The frequency of drought has been increasing and is expected to increase in the future as a result of climate change. A meteorological drought usually precedes surface water and then groundwater drought. While droughts have always been a fact of life in the two partner states, the combination of drought with human activities such as overgrazing or deforestation may dramatically lead to a permanently or near-permanently degraded environment. Drought is associated with significant human and social economic losses, where livelihood and food security depend on vulnerable rainfed subsistence farming and livestock production. The 1991/92 drought had a most crippling effect over much of southern Africa with many countries from central Zambia through central Malawi and Mozambique southwards having seasonal deficits of up to 80% of normal rain. Large sections

across South Africa, Mozambique, Zimbabwe, Botswana and Zambia received scanty rainfall (20 to 75% of normal) during the rainy season from October 1991 through April 1992. The extreme dryness was exacerbated by abnormally high temperatures. The drought in Zimbabwe resulted in an 11% decline in Gross Domestic Product (GDP) and a 60% decline in the stock market (WWDR 1).

The onset of a drought is slow and very different from flooding with respect to the size of the affected area, the duration, the measures that can be taken to mitigate the impacts of the hazard and the ability to forecast the onset of the disaster. The improvement in recent years in seasonal and long-term climate predictions, such as those issued by many national and regional institutes, including WMO's Drought Monitoring Centres in Zimbabwe will assist effective implementation of contingency plans.

Pollution and water quality: Diffuse or pointsource pollution is one of the most serious forms of ecosystem degradation affecting water security in the three basins. Ecosystem degradation occurs when the ecological functioning of an ecosystem – and therefore its capacity to deliver ecosystem services – is reduced, even if its type and extent are maintained. The numerous on-stream uses (such as fishing, and ecosystems), which although generally nonconsumptive, depend on a certain level of flows and water quality to function. However the pollution of the rivers from the discharge of raw sewage from sewage works and mining activities is problematic, especially in Zimbabwe. Localized pollution occurs frequently with mining activities in Zimbabwe. The pollution could lead to serious environmental degradation and water contamination. Negative impacts include groundwater contamination with heavy metals from mine tailings affecting downstream ecosystems and drinking water in the three basins. In particular there is a risk of acid rock drainage and cyanide spills from gold mines and artisanal mining activities prevalent across the basin. However relevant information about pollution loads and changes in water quality is lacking precisely where water use is most intense because of inadequate monitoring systems. As a result, the often serious impacts of polluting activities on the health of people and ecosystems remain largely unreported. The degradation of water resources has a particularly detrimental effect on poor communities that are highly dependent on ecosystems for their livelihoods.

Salinity: Water resources development and withdrawals have led to increased turbidity and salinity of water and soil, making land and water management more difficult especially in the estuaries of the three river systems. Saline groundwater is a reported problem in all coastal areas where also high nitrate concentration sometimes occurs. Increasing salinity levels in groundwater are caused by a range of processes, sometimes associated with intensive exploitation of groundwater near saline groundwater bodies (e.g. seawater intrusion in coastal zones) or with increased evaporation in zones where groundwater levels have become shallow due to excessive infiltration of surface water. Consequently, saline water intrusion has negative effects on the agricultural production in the region. Water flowing out of the Save river is often committed to other downstream uses, including several often overlooked functions: flushing-out sediments, diluting polluted water, controlling salinity intrusion and sustaining estuarine and coastal ecosystems. The level of salinity has a direct consequence on the quality of the estuaries. A better regulated flow could also reduce salinity intrusion caused by the decline in freshwater availability in the dry season. This, however, would require strengthened regional cooperation, which has not yet been realized.

Groundwater vulnerability: The recurring droughts in the region have demonstrated the potential value of groundwater as a more reliable and dependable source of water than surface water. The importance of groundwater in drought management emanates, among others, from its availability in population centres, providing renewable quantities of fresh water. Consultations with the Pungwe Program Steering committee, revealed that groundwater services are in heavy demand, especially in the rural areas in the three basins of Pungwe, Buzi and Save. Widespread and persistent groundwater pollution occurs in many parts of the basins. Common causes include leaching of agro-chemicals; the infiltration of urban and industrial effluents; mining and disposal of untreated waste. Pollution not only reduces the value of groundwater as an extractable resource, but it also affects groundwater-related ecosystems. Vulnerability to pollution is generally linked to aquifer's accessibility. Aquifers that are shallow and 'open' to regular and dependable recharge are more likely to suffer pollution from agrochemicals and urbanization (in particular, from low-cost wastewater disposal and inadequate disposal of industrial chemicals)—. negative externalities from weak regulation.

Declining groundwater levels or quality are cited as the main reason for the need for management action, but resource depletion and degradation are only part of the problem. Precise data on the status of groundwater resources are still not available in sufficient detail to make a regional assessment of the ground water potential in the three basins. The IPCC has highlighted the implications of accelerated climate change for groundwater, and changes in excess rainfall (recharge and runoff patterns) are expected to add to the resource management burden for both groundwater depletion and rising water tables, depending on the region. But these impacts are likely to be small (and possibly negligible) compared with the stresses placed on groundwater systems by current socioeconomic drivers. If not contained, these environmental issues will

affect the natural ecosystems of global significance mentioned above as they rely on the river flows. An appropriate planning and management of the river basins in the Beira corridor is essential to the protection of some ecosystems of global significance, specifically in terms of biodiversity.

Root causes of the Environmental Issues

Exploitation of natural resources: The economies of Mozambique and Zimbabwe are both based on the exploitation of natural resources. While economic development may lead to ecosystem decline, ecosystem services in the three basins underpin economic development, so the real challenge is in the recognition of the economic value of ecosystems in planning, priority setting, investment and decision making. On the other hand, infrastructure development is booming to boost exploration, processing and transportation of various resources. This has happened in the Beira Corridor and the Basins that are linked to it. These activities are already affecting the forest cover. The different ecosystems find themselves in varying conditions ranging from almost pristine to stressed and degraded. Environmental stress in the different ecosystems is, in general, caused by accelerated economic development (mining), unsustainable land use (shifting agriculture and deforestation), unsustainable water management (storage) and climate change (e.g. drought or flooding). Agriculture also has a significant toll on biodiversity. Long-term trends of degrading ecosystems, increased rainfall variability, water pollution and land degradation place additional strains on poor people and long-term development.

Deforestation and forest degradation: Disruption of ecosystems through unabated urbanization, inappropriate agricultural practices, deforestation and pollution are among the factors undermining the environment's capacity to provide ecosystem services, including clean water in the three basins. Conservation and forested areas are suffering significant stress due to the competing use for land made by sectors such as agriculture, mining or infrastructure development (dams). Deforestation in the area is partly due to the production of charcoal for domestic use but also because of an increasing demand for hardwood timber, especially from China.¹⁴ The forests are under great stress from uncontrolled fires and unlimited charcoal exploitation without the proper forest management systems in place. For example, in the districts of Dondo and Nhamatanda (Pungwe River Basin) and in the districts of Chemba, Caia and Marromeu (in the Zambezi valley), the availability of firewood and charcoal is critical for some regions not only because of high population density, but also for being plain areas, naturally with low biomass reserves.¹⁵

Deforestation and other land-use changes, soil degradation, withdrawals for agricultural and industrial use, and water contamination have a profound and often negative impact on the availability and quality of water resources. There is also a link between deforestation and increasing flood risk, which has been observed at the micro level and over particular catchments. Deforestation results in degradation and desertification of watersheds and catchment areas, and reduces the amount of usable safe water available downstream.

River basins shared between Mozambique and Zimbabwe have considerable forest resources, particularly in the central and eastern parts of the basins along the border between Mozambique and Zimbabwe. In Zimbabwe, forest reserves constitute 45% of the land area and contribute approximately 3% of the Gross Domestic Product, largely from exotic plantations and commercial indigenous timber. Most of these are in Chimanimani, Mutare rural. The commercial forestry sector is estimated to employ approximately 14,000 people. Approximately 23% of rural household incomes depend on forest-based activities. Natural forest areas are currently under threat of deforestation due to land clearance for agriculture, over exploitation of trees for domestic and agricultural uses, wild fires, overgrazing. It is estimated that 1.8% (320 000 ha) of Zimbabwe's indigenous forests are lost due to agriculture and other household uses that include energy and construction timber. Forests have also been affected by during the land reform programme through illegal settlers clearing plantations and research plots for settlement and agricultural purposes¹⁶.

Population increase and poor land use planning: Increasing regional water demand, particularly in the Save basin is largely influenced by population growth, urbanization, food and energy security policies, which result in increased storage, and macro-economic processes such as increasing consumption. As populations increase and ecosystem services decline, the risk of resource conflicts rises especially where tensions already exist along socio-economic lines. In Mozambique in particular, the terrestrial fauna has undergone a major change in the last 40 years due to population increase, development

¹⁴ Belt, J. Bech, N. Locke, A. Machado, M. & Meindertsma, J.D. (2012). *Support to inclusive and sustainable development in the Zambezi Valley, Mozambique: Formulation of a project to be funded by the Dutch Government to the Zambezi Valley Development Agency and strategic partners* (Final report/2012), Centre for Development Innovation, Wageningen UR (University & Research centre)

¹⁵ MPD, ADVZ & MICOA (2015). *Avaliação Ambiental Estratégica, Plano Multisectorial, Plano Especial de Ordenamento Territorial do Vale do Zambeze e Modelo Digital de Suporte a Decisões*. Ministério de Planificação e desenvolvimento, Agencia de Desenvolvimento do Vale do Zambeze, Ministério para Coordenação da Acção Ambiental

¹⁶ SUSTAIN Africa, 2016, Final Situational and Stakeholders Analysis

and the past political instability that confined most of the large mammals to existing conservation areas. In this regards there are several human-animal conflicts, especially in parts near protected areas—where communities actively depend on the natural resources. However, while economic and population growth are set to increase strain on existing water resources, most economic models are yet to value the essential services provided by freshwater ecosystems, a mistake that often leads to unsustainable use of water resources and degradation of aquatic ecosystems in the three basins.

Mining and Industry: Water resources in the three basins are a key resource for industrial and manufacturing processes, but generated wastewater can cause environmental damage when discharged untreated. The effects of gold mining activities in the basin dominate the water quality of the Pungwe River surface water. A special study within the Pungwe project has been focused on the impact that gold mining has on the aquatic environment. Before, these activities mainly took place in the surroundings of the tributary Nhamacurara River in Manica Province, which are, at some places, destroyed. However artisanal gold mining activities have increased steadily in the Pungwe basin. As of today, the informal gold mining activities have spread in the Pungwe River basin, and take place as far downstream in the basin as Muda River in Sofala Province. Extensive informal gold mining activities take presently place in the Gorongosa area close to the National Park

Artisanal gold mining has become a major safety valve, cushioning the worst effects of structural adjustment, recession and drought by providing people in the rural areas with an alternative way of securing a livelihood. However, effective 2004, water siltation resulting from small-scale gold mining along the Pungwe river system has resulted in a decrease of the fish population and has made water unfit for human consumption in catchments where this resource was already scarce.

Most small-scale miners use mercury amalgamation to prepare final gold concentrates. Mercury is one of the most toxic substances in the world with long-term and farreaching effects causing significant damage to the environment and to the health of people who handle it. The mercury released into watercourses travels long distances and can be transformed by micro-organisms into more toxic forms (methyl-mercury), which then enter the food chain. In addition to mercury discarded or spilled directly into streams and rivers during the amalgamation process, a considerable volume of mercury vapour is released each year to the atmosphere. Much of this quickly returns with rain to the river ecosystem.

In addition to mercury, high concentrations of other heavy metals, e.g. lead and cadmium, were found in the suspended sediments during the sampling campaign in 2004. The metals naturally exist in the soil of the Pungwe River basin and are thus transported to the river system through the mining activities. Similarly to the mercury, these metals are bound to the sediment particles and pose therefore not a direct threat to humans and biota.

In the Buzi basin in Zimbabwe, artisanal gold mining is common. There are also quarrying activities being undertaken by Job Crushers in Mutare rural. The potential for exploitation of minerals in the Buzi basin¹⁷ also consists of an active gold mine in the Penha Langa area in Manica Province, mining of lime in the Macundane area in Machaze District and in the Mupengo area in Mossurize District, as well as potential deposits of coal, iron, asbestos, gold in Dacata Administrative Post in Mossurize District. Limited quantities of gold and diamonds have been found by artisanal miners along the Chinhica and Mossurize rivers. Artisanal gold mining is also reported to be taking place in the Chimanimani Reserve in Sussundenga District. It can also be mentioned here that exploration for oil and natural gas is taking place in the Buzi-Divinhe Block and offshore from the Buzi estuary in Buzi District in the eastern section of the basin. There are a growing number of investments in mining and associated processing facilities, especially in the central and western parts of the basin. The interest in the area has increased substantially in recent years as a result of mainly two factors. First, the increasing demand for metals and minerals and the associated price increases have led to a significant increase in investment in the sector worldwide. Second, the concerted efforts made by especially the government of Mozambique to open up its mining sector for foreign investments, and to encourage the development of national mineral sector companies.

Fisheries: Different ecosystems provide different services. Mangrove wetlands, for instance provide other direct economic benefits such as fisheries and tourism. Indeed many uses of aquatic ecosystems in the three basins (e.g. fisheries, recreation, water purification, biodiversity maintenance, some forms of flood reduction) depend on ecosystems that are at or close to natural conditions. The bulk of capture fisheries production comes from coastal waters, where both the productivity and the quality of fish stocks are severely affected by pollution, much of which comes from agriculture. However the fishing industry also exerts pressure on the mangroves in the region. For example; if the shrimp industry in the Sofala area (in the Buzi River Estuary region), very significant for the national economy, remains at the current exploitation levels, together

¹⁷ Development of the Buzi River Basin Monograph and Joint Integrated Water Resources Management Startegy, 2011

with the destruction of mangroves and the practice of trawling on seagrass beds, shrimp species and entire fish populations will decrease dramatically¹⁸.

Climate change: Climate change is threatening water security in Southern Africa by triggering, accelerating or intensifying (or all three) changes to the water cycle. These changes are occurring, and will continue to occur, primarily at the ecosystem level. In turn they will alter the availability (both quantity and quality) of water for ecosystems, thereby adding additional stress to ecosystem services to that resulting from other human caused pressures on ecosystems. Climate change also has a significant impact on ecosystems. The effect on wetlands and their multiple ecosystem services is expected to be severe. Rising sea levels will likely threaten biodiversity, while increased frequency and strength of storms and tidal surges will likely increase damage and variation of sediment transfer in river flows (Boelee, 2011). The Pungwe and Buzi Rivers are likely to get increased rainfall and runoff, while the Save River will get significantly lower water resources. The Eastern Highlands seems to be a divide for the effects of a future climate change. It is likely that floods will be more severe and more concentrated within the year.¹⁹ Climate change in combination with environment degradation (eg: deforestation, land degradation) increases disaster risk.

In recent years, Central Mozambique has been seriously affected by several types of water-related hazards. Triggered by the influence and activity of the El Niño-Southern Oscillation (ENSO), the central region of Mozambique is frequently affected by droughts, floods and cyclones. Whereas there have been a number of droughts in the past decade, recent rainy seasons have been characterized by flooding in the Buzi Basin. As a result of the major events in the beginning of 2000, a participatory disaster risk analysis, planning and management exercise was carried out in Buzi and neighbouring Chibabava District in Sofala Province in 2005 with support from GTZ. Floods cause frequently problems in the lower parts of the Pungwe River basin. Floods are, however, also important for the ecology of the river system. Flood plain cultivation and the estuarine fauna are dependent on the nutrients that are flushed out during high flow periods. The main characteristic of the floods in the lower basin is that they are long-lasting with very long periods of high water levels. Especially 1999 and 2001 floods show periods of 2-3 months with very high flows. The current disaster response and prevention management strategies are often still insufficiently integrated, and focus on individual disasters (e.g. floods or droughts) rather than pursuing a holistic, sustainable development and resilience-based approach

Barriers

Barrier #1: Inadequate Knowledge generation for policy formulation: Despite past interventions, the adequacy of observational networks varies widely by basin, but observations for many water cycle variables have inadequate spatial and temporal coverage. Continuously and consistently quantifying hydrologic variables at the basin and national levels will require integrated observation systems that use both terrestrial observations. These systems will need data assimilation products, including models calibrated from the integrated networks and multiplatform observations for improved ecosystem management. If the changes in the river flows are not monitored, planned and integrated into national policies and regulations, the livelihood of hundreds of thousands people will be affected. This could also threaten critical ecosystems such as the Gorongosa National Park in Mozambique or the Mangroves ecosystems in the estuaries of Pungwe and Buzi River on the Coast around the city of Beira. Amid the variety of water resources adaptation issues, enhanced monitoring and evaluation of weather and climate are clearly priorities for coping with the floods and droughts experienced across the basins in the two partner states. There is often a clear inverse relation between data availability and water resources vulnerability, highlighting the need for identifying focus areas that combine a high fragility with a high complexity of the natural environment and low data availability.

Barrier # 2: Inadequate Policy and regulatory framework in key sectors: Some sectors like the agriculture and energy sectors that are highly demanding on water resources have inadequate policy and regulatory frameworks associated with water and environmental management. There is, for instance, need for policy and regulatory frameworks in the water and environment sector to inform, sectoral development levels in the energy and agriculture sectors and vice versa. This would underpin integrated management and development of the shared water resources in the three basins.

Barrier #3: Low Institutional capacity: There are many legal instruments for water and environment management, but these require to be further enforced at national level. Moreover, the institutional framework is facing serious problems of limited technical capacity, lacking essential tools for ecological and socio-economic monitoring, to support decision making in basin management. Finally, civil society remains weakly involved in the management of the basin and community initiatives.

¹⁸ SADC/SARDC, Zambezi Watercourse Commission-ZAMCOM, GRID & UNEP. (2012). *Zambezi River Basin Atlas of the Changing Environment*. Gaborone, Harare and Arendal.

¹⁹ Development of the Buzi River Basin Monograph and Joint Integrated Water Resources Management Strategy, 2011

Barrier # 4: Climate change impacts: Recent assessments indicate that Climate Change will increase the vulnerability of ecosystems of the Southern Africa region, due to temperature increases, changes in precipitation patterns, frequent severe weather events, and prolonged droughts. Climate change will affect water quality and ecosystem health through higher water temperatures, lower water levels, more flooding and changes in lake stratification patterns.

These factors, in turn, will further diminish the ability of natural systems to filter water and create buffers to flooding. Higher water temperatures and changes in extremes, including floods and droughts are projected to affect water quality and exacerbate water pollution – from sediments, nutrients, dissolved organic carbon, pathogens, pesticides and salt as well as thermal pollution. Increase in extreme precipitation and flooding will increase erosion rates and wash soil based pollutants into the three river systems. Increase in water temperatures will lead to more algal and bacterial blooms that contaminate water supplies, thus contributing to environmental health risks and impact on the productivity and distribution of fish. Changes in water quality will likely contribute to changes in ecosystem composition, function and services, altering the resiliency of ecosystems.

Barrier # 5: Inadequate provision for ecological flow management: There is inequitable and unsustainable allocation of water resources among competing uses, particularly the water, food and energy sectors. A critical impact of poor allocation decisions is inadequate allocation to ecosystems, undercutting ecosystem services needed for livelihoods and development and causing biodiversity loss. Therefore introduction of robust, equitable and sustainable allocation mechanism is a critical need. E-flows is simply a methodology underpinning water allocation decisions; it includes all relevant sectors and treats ecosystems as a water user alongside these sectors, therefore eflows will be developed as a tool for integrated management of flows in the basins and to provide the evidence base for decision making on allocations. The proposed IUCN /GEF project will thus introduce an ecosystem approach to addressing the water-food-energy nexus in the three river basins of Pungwe-Buzi and Save basins.

Barrier # 6: Inadequate partnerships between public and the private sector: There is an urgent need for close partnerships and joint action among the public and the private sectors, and rural communities to ensure that investments flowing into growth corridors include solutions for the sustainability of water, land and ecosystems that are socially inclusive, that build resilience to climate change and which generate substantial global environment benefits (eg: biodiversity hotspots of the Nyanga National Park in Zimbabwe and the Ngorongoza National Park in Mozambique).

Barrier # 7: Inadequate coordination in the planning and decision making at the basin level: This is needed to respond to the growing economies related to these basins (eg: Beira Corridor) but also to the growing effects of climate change on water resources, as reflected above. The Governments of Mozambique and Zimbabwe comprise the Joint Water Commission, which manages the river basins that are shared among the two countries. The Ministers responsible for water resources signed an agreement for co-operation on the development, management and sustainable utilization of the water resources of the Pungwe watercourse on 11 July 2016. However, there is still need for a River Basin Organisation on the Pungwe. There are also no specific agreements related to Buzi and Save.

Barrier # 8: Inadequate participation, gender and development, social safeguards, and management of social risks and vulnerabilities in natural resources management: Each of the mentioned social dimensions although inadequately mainstreamed is meant to support broad social development outcomes in the two partner states. Strengthened participatory approaches are essential for poor and marginalized groups within the three basins to express their interests and contribute to development planning and activities. Social norms and practices often disadvantage women and girls in terms of their access to services, resources, opportunities, and decision making; therefore, gender analysis would be a fundamental tool to ensure that development interventions are inclusive, equitable, and empowering for both women and men. Adherence to social safeguards and attention to social risks and vulnerabilities are both intended to bolster the security of poor and vulnerable individuals, households, and communities against various shocks.

2) The baseline scenario or any associated baseline projects

The proposed IUCN/GEF Project builds on the achievements of various initiatives, mainly the Pungwe Integrated Water Resources Management Program, financed by Sweden, and the IUCN financed BRIDGE program, in the three basins.

The Pungwe River basin Agreement

On July 11, 2016, Zimbabwe and Mozambique signed an agreement on the Pungwe River basin. The agreement builds upon the principles of the revised Protocol on Shared Watercourses in the SADC region. By signing the agreement, the two

partner states agree to the three principles of equitable and reasonable utilisation of the shared water resources in the Pungwe basin, prevention of significant harm and prior notification. The Agreement provides a framework for development of protocols that enhance the principles of cooperation like data and information sharing and exchange²⁰, as well as implementation of environmental flow requirements in greater detail. The treaty emphasizes the most relevant issues, such as certain ecosystem factors or the interests of communities that depend on the shared water resources of the Pungwe. Signing of the agreement, will hence set forth a process for establishing a shared water course institution, with financing from Sweden. It will also be catalytic in triggering similar cooperation on the Buzi and Save basins.

The Pungwe River Basin joint intergrated water resources management strategy (2005)

The strategy developed through the Sweden financed “Pungwe Programme” enabled the assessment and estimation of the various water demands from the Pungwe River in both Zimbabwe and Mozambique. It looked at the various sectors of the economy influencing water demand (agriculture, mining and industry, tourism) in this area where economic development and investment in related infrastructure is fast and important in scale. The study provided insight into the possibilities and potentials of dams in the Pungwe River Basin. This was done in accordance with growing water supply to a variety of users (growing population, agriculture, mining and industry, tourism sector). It provided recommendations on the potential large and medium dams that could be implemented on the Pungwe River.

The Pungwe Programme (Swedish International Development Cooperation Agency - SIDA)

The Pungwe Basin Trans-boundary IWRM Programme represents an endeavor by the Governments of Mozambique and Zimbabwe, with support from SIDA to address key social, economic, environmental and institutional challenges in the shared River Basin. The Programme’s overall objective is to strengthen institutions, stakeholders and systems at all appropriate levels for joint, integrated and sustainable management of water resources in the Pungwe River Basin, and to stimulate and support appropriate development-oriented investments in the Basin to contribute to poverty alleviation and environmental sustainability.

Phase I (2001 and 2007) was financed by Sida up to USD 3.3 million (SEK 30 million). This was followed by a second phase financed to the tune of USD 13 million (SEK 117 million) until 2012. The programme worked on three main components:

- Protection of the environment: To restore the integrity of the Pungwe River and to minimise the impact of environmental degradation by promoting environmentally sound water resources management practices.
- Institutional development: To strengthen the capacity of key basin IWRM institutions to efficiently, effectively and sustainably fulfil their defined roles and responsibilities.
- Regional cooperation: To formalize and enhance cooperation between Mozambique and Zimbabwe in the development and management of Pungwe, Save and Buzi shared river basins by supporting the establishment of the Bilateral Institution and enhancing stakeholder participation in sharedriver basins.

This support has largely contributed to the establishment of the structures and institutional bodies related to the management of the Pungwe river. These are namely: the Joint Water Commission, the Programme Steering Committee, the Project Management Committee, the Programme Support Unit, the Consultative Groups. The Pungwe programme is managed by the regional institution Administração Regional de Águas do Centro in Mozambique and the Zimbabwe National Water Authority. The financial support comes from Sida and from the two countries.

Building River Dialogue and Governance Phase 3 (IUCN)

In the Pungwe, Buzi and Save basins, steady improvements have been made towards joint IWRM between Mozambique and Zimbabwe. However, there are also weaknesses in existing structures to deal mainly with the assessment and protection of environmental flows. During the consultations carried out in the first phase of BRIDGE Africa the Governments of the two countries requested IUCN to assist in this regard through BRIDGE. The BRIDGE Phase 3 project which commenced in January 2016 and is scheduled to end in December 2018 supports both Mozambique and Zimbabwe, which have made strides in mainstreaming environmental requirements in policy, in translating of these into legislation and field practice, to operationalize requirements in water allocation procedures to strike a balance between consumptive/non-consumptive uses and environmental flow requirements. In a system such as the Pungwe, which is considered relatively pristine, determining

²⁰ The collection and exchange of relevant data is the basis for effective cooperation. It is important that data are made accessible to both affected states and local stakeholders. Therefore, it is good practice for states to exchange readily available data and information on the condition of the shared water resource on a regular basis

environmental flows to maintain the ecological integrity of the Pungwe River and its tributaries is key in light of the planned future infrastructural developments, growing population and climate change.

The goal of the Building River Dialogue and Governance (BRIDGE) Project is “Securing sustainable management of water resources for poverty reduction, nature conservation, economic growth and international cooperation through effective water governance”. The main expected outcome is “enhanced water governance capacity for transboundary cooperation in Pungwe/Buzi/Save basins translates to action planning around concrete transboundary water management issues”.

The main expected outputs for PuBuSa are:

- Strengthened legal and policy provisions for implementing effective transboundary water governance around Environmental Flows protection
- Strengthened national policy and PuBuSa transboundary agreements to incorporate e-flows, and implementation of an e-flow pilot demonstration in an appropriate site in the Pungwe, Buzi or Save basin to demonstrate transboundary cooperation in determining e-flows
- Enhanced capacity and knowledge base to cooperate on the implementation of e-flows in the Pungwe/Buzi/Save basins – activities include capacity building workshops on e-flow policy, methods, and implementation to enhance transboundary negotiation and consensus on e-flows.
- Experiential learning from the three basins to inform and influence policy and planning at regional level – activities include convening BRIDGE e-flow training in other RBOs in the SADC region and sharing lessons from the pilot demonstrations

Sustainable Groundwater Management in SADC Member States Project

A regional project to build Sustainable Groundwater Management in SADC Member States is under implementation by the SADC Secretariat. The project is financed by the World Bank through a US\$9 million grant from the Global Environment Facility (GEF), and US\$2.0 million from the multidonor trustfund, Cooperation on International Waters in Africa (CIWA).

Considering the challenges of climate change, pollution and rapidly growing water demand in southern Africa, the project aims to strengthen the management and development of groundwater for social and economic development. The project supports activities at regional, basin and national levels. There are over 30 shared aquifer systems identified across southern Africa and Member States often share similar groundwater challenges

The project plans to implement priority actions in the work-programme for groundwater in the SADC Regional Strategic Action Plan for IWRM (RSAPIII, 2011–2015). Institutional and technical capacity to implement national reforms will be strengthened; and cooperation on shared aquifers in the region will be facilitated as a result of the project (in alignment with the Revised SADC Protocol on Shared Watercourses of 2000 and river basin agreements across the region).

The results indicators at the PDO-level are: (i) Development of the SADC Groundwater Management Institute into a regionally recognized center of excellence; (ii) Transboundary and national institutions strengthened to improve regional cooperation; and (iii) Enhanced capacity for sustainable transboundary and national groundwater management in the Ministries and departments responsible for groundwater in SADC Member States.

The Project components and activities build on the achievements of the SADC Groundwater and Drought Management Project (GDMP) implemented with a US\$7 million support from the World Bank and GEF between 2005 and 2011. The components are also designed considering mutually reinforcing groundwater activities in the region at national and transboundary levels. All components and activities are financed by the GEF and CIWA Grants.

The Project has four components. Through the first Component the SADC Groundwater Management Institute will be operationalised to serve as a center of excellence for groundwater in the region. Through Component 1, the remaining three components will have greater impact in the areas of institutional, information and infrastructural aspects of groundwater management among SADC Member States from local to regional levels. This project is key, with regard to mainstreaming of ground water and drought management into basin planning.

African Development Bank – SADC Shared Watercourses Support Project for Buzi, Save and Ruvuma River Basins

In 2006, the African Development Bank (AfDB) supported the SADC in establishing a sustainable framework for an integrated planning and management of shared water resources in the Buzi, Save and Ruvuma river basins.

The Project Goal was to ensure the development of integrated water resources management and related physical infrastructure development that contributes to regional integration and poverty reduction. The Project Objective was to ensure a sustainable framework for an integrated planning and management of shared water resources in the Buzi, Ruvuma and Save river basins for development and support of improved livelihoods of the local communities.

The project comprised five components, namely (A) Development of River Basin Monographs and Strategies, (B) Enhanced Knowledge and Information Support System (C) Community Basin Management, (D) Project Management and Capacity Building (E) Audit Services.

The total cost of the project was estimated at UA 10.43 million. The offices of ZINWA-Save and ZINWA-Runde, in Zimbabwe, and ARA Centro in Mozambique handle project activities on the Save and Buzi Basins. While Ruvuma Basin office in Tanzania and the ARA Norte office in Mozambique handled project activities on the Ruvuma Basin.

The IUCN/GEF project is expected to contribute towards advancing the result areas of that project.

SUSTAIN Africa

IUCN and a consortium of partners in consultation with national governments are implementing a program on sustainability and Inclusion Strategy for Growth Corridors in Africa - SUSTAIN-Africa. SUSTAIN-Africa implements demonstration activities in two African growth corridors to increase knowledge, skills and capacities among communities, business and government entities on ways to use water, land and ecosystem management to build climate-resilient water and food security while generating growth. The selected corridors are the Southern Agricultural Growth Corridor of Tanzania and the Beira/Zambezi Valley Development Corridor in Mozambique. The latter is directly related to the current GEF project. SUSTAIN-Africa provides a basis for policy innovation that IUCN and its partners in the civil, public, and private sectors use to increase the sustainability and inclusiveness of growth corridors as they are developing across the rest of Africa.

The programme is structured around a set of four strategic result areas, which include the following:

- A sustainable and climate-resilient supply of water supports livelihoods, production, health and ecosystems, coupled with lower water-related risks (Water security);
- Landscape management and restoration enhance climate change resilience using climate-smart agriculture, while supporting food security and low-carbon development through new value chains that link primary production with trading and enterprise opportunities (Climate change adaptation and mitigation through land resource management);
- New business models and partnerships in growth corridors build long-term synergies between development and conservation and raise investment and lower risks for rural households, commercial enterprise and sustainable economic growth (New investment and business partnerships);
- Improved public and private sector strategies for sustainable water, land and ecosystems and for climate change resilience are integrated into business planning and policies on economic growth Policy, learning & evidence).

SUSTAIN-Africa helps to shape planning processes and investment flows to strengthen climate change resilience and food and water security for local communities and especially smallholders, including women farmers and their households. The program ensures that these groups can participate equitably in the economic opportunities created in corridors and develop entrepreneurial pathways to generate more value from the land, water and ecosystem resources that underpin agricultural, forest and wetland-based livelihoods. Business and social investors will hence play a strong role in creating the partnerships and investment flows needed for green and equitable growth corridors.

The model for change and scaling-up used in SUSTAIN-Africa combines joint action on the ground, consensus building among stakeholders, dialogue to define more inclusive and sustainable norms for growth and policy framing to help the strengthening of institutions, rules and implementation incentives.

In addition to concrete activities implemented at the cluster level, on the ground, SUSTAIN Africa facilitates the collection, dissemination and application of knowledge. This has two purposes: 1) it reinforces the activities led by partners at cluster and corridor level by supporting capacity building of stakeholders. Second, it supports the use of knowledge from the programme on effective ways of enhancing sustainability and social inclusion to shape and influence policies and strategies used in growth corridors by companies and governments, and at Africa-wide level.

Climate Resilient Infrastructure development facility (CRIDF)

CRIDF is a water infrastructure programme for Southern-Africa, which will deliver sustainable small-scale infrastructure across the SADC region countries. It is mainly funded by the United Kingdom (UK) Department for Foreign International Development (DFID) to the tune of (£ 25.4 million). The Facility works in 11 mainland SADC countries, with particular attention to Malawi, Mozambique, South Africa, Tanzania, Zambia and Zimbabwe. It supports any action or project at regional, national, sub-national, or local level that better enables people – particularly the poor – to predict, manage, or mitigate the impacts of extreme climate events through infrastructure interventions. Headquartered in Pretoria, South-Africa, the demand-driven programme focuses on water services, water resource management, and agriculture, creating a lasting impact on the region's water, food and energy security. CRIDF has a strong focus on transboundary water management, and the benefits that emerge from cross border cooperation. For this reason, the Facility works closely with the transboundary River Basin Organizations in SADC. CRIDF supports the region with 4 types of interventions: (i) small scale infrastructure projects (ii) Infrastructure finance (iii) Technical assistance to stakeholders and (iv) Changing the operating environment.

Summary of baseline and gaps in basin management in the Pungwe-Buzi and Save basins

The economies of Zimbabwe and Mozambique, have embarked on a unique path to promote poverty reducing and economic growth. This, while commendable, introduces a strain in the water-food-energy-ecosystem nexus thereby introducing cross-sectoral vulnerabilities. Trends imply that the strain will be exacerbated by: (i) growth in total demand for food and energy and water, driven by population growth, (ii) growth in per capita demand for food, energy and water, driven by economic growth (iii) global climate change, which will distort the availability of water, and (iv) policy choices, by which people are selecting more water-intensive agriculture and energy and more intensive water. Policy options are available to decision-makers to improve energy and water supplies without compromising either resource.

Past programs, and many other players, not least the national governments are contributing in one way or another to this broad approach to economic growth on both partner states.

The project is designed as a foundational project and conscious of drivers of degradation and need to address competing inter- sectoral and cooperative uses. Sustainable development, including water security, is dependent on maintaining ecosystem services. The proposed IUCN /GEF project introduces an ecosystem approach to addressing the water-food – energy nexus at different scales and across multiple sectors in the three river basins of Pungwe-Buzi and Save basins. Managing ecosystem services is about trade-offs —choosing one benefit over another. Applying a WEF nexus analysis at different scales will strengthen collaboration between stakeholders, and help to identify measures for cooperative governance and management that support outcomes along multiple value chains within the nexus.

Thus the planned IUCN/GEF program has broad objectives to enhance sustainable benefits to riparian communities, conserve biodiversity, and provide the riparians with harmonized and shared tools to regulation and management of the three river systems. The planned project will focus on strengthening the scientific understanding of the riverine ecosystems; and secondarily to pilot technologies that can promote sustainable livelihoods for communities, and lay a foundation for better management of the river systems.

The emphasis on a knowledge based ecosystem approach to basin management complemented by strengthened institutions, harmonised policy frameworks and regulatory framework (building on the recently signed Pungwe agreement) will lead to coordinated and sustainable management of transboundary natural resources, promotion of economic growth and addressing the associated environmental concerns.

3) Proposed alternative scenario, GEF focal area strategies, with brief description of expected outcomes and components of the project

The economic growth in the Pungwe-Buzi and Save basins is dependent on the progress made in the development and management of the shared water resources. Management as well as regulation of water resources is a critical factor underlying efforts to promote growth and raise incomes. A regional program will offer substantial potential to achieve results on water resources management and development issues that affect neighbouring countries by availing a coordinated platform that will optimize the basin's investment potential (net benefits) and promote development in support of sustainable economic growth and poverty alleviation and contribute towards regional stability. The efforts will contribute

towards attaining the goals of the Africa Vision 2025²¹ ; Ministerial declarations²² and the sustainable development goals (SDGs) for improving water security within the region, building on a platform of strong country commitment.

The design of the proposed IUCN/GEF project will build onto results achieved by various programs in the past which include but are not limited to monographs, information data bases, and integrated water resources management plans in the three basins of Pungwe-Buzi-Save, as well as other baseline projects in the two partner states.

One of the alternatives, is the planned third phase of the Pungwe Programme (PP3) which is currently being discussed (to commence effective 2017). Broad areas proposed to be addressed include: Salinity Control in the estuarine regions, gold panning Management and Mitigation, Flood and Drought Warning and Mitigation, Sustaining Environmental flows in Gorongosa National Park and Lake Urema, Small and Medium Dam Development Strategy, Integrated Water and Land Use Strategy and community driven type interventions for improved basin management. The project is currently under negotiation with the Sweden International Development Agency (SIDA) and expected budget is USD 15 million.

A second alternative is Phase II of CRIDF which is being prepared and should be approved by the UK Government in order to start in 2017. Given the additionality of the IUCN/GEF to the current CRIDF work, it is possible that the next phase of the CRIDF is considered for co-financing of the IUCN/GEF project. However, this will be confirmed during the preparation of the CEO endorsement request, once the funding for the second phase of CRIDF is approved.

GEF IW financing is proposed as incremental to ongoing and planned development programs, planned by the two partner states, with assistance from bilateral and multi lateral partners. It covers all the three basins of the Pungwe-Save and Buzi. It mainly focuses on (i) Integrated multi sectoral basin planning for the Pungwe - Buzi –Save River Basins (ii) Flood and Drought Warning and Mitigation and (iii) Strengthening the transboundary environmental flow policy and regulatory framework for the Pungwe-Buzi and Save basins. The program is expected to advance discussions and contribute towards the water-food-energy-ecosystem-climate change nexus.

The project will promote the understanding of the degree of connectivity of ground water with surface water, which will inform the extent of conjunctive management of surface and groundwater that is essential to achieve the efficient use and improved conservation of both resources. This interaction can go both ways (shallow groundwater systems being recharged by streams or irrigation canals, and vice versa) — the relation changing between seasons and along the course of a stream. Groundwater’s capabilities to buffer seasonal and multi-annual climatic variations are traditionally made use of in the dry areas in southern africa.

The improved knowledge base on the ground water – surface water interactions, will inform the integration of ground water governance into basin planning as well as quantification of measures in the TDA/SAP process. In practice, RBOs focus on management of surface water. However, the separation of management of surface water from that of groundwater runs counter to IWRM best practice, particularly as the base flow of rivers in many cases comes largely from groundwater. Outcomes will inform Institutional set-ups in the planned RBO to facilitate conjunctive management of surface and groundwater through communication between basin-level and national or local offices dealing with groundwater at the aquifer unit or sub-catchment level. Factoring in the local context will be essential, as the resource, the socio-economy and the institutional context vary widely in the two partner states.

The project will support stakeholder participation in the ecosystem basin based approach. During project preparation a participatory process will be adopted including the two partner states as well as communities, civil society, private sector etc. The social analysis conducted during project preparation will include careful consideration of gender issues highlighting both constraints and opportunities. The project will be enhanced to—adopt pro-poor, socially-inclusive, and gender-responsive approaches through the development of specific components promoting people-centered interventions. Project components will be designed to directly improve women’s access to social services, and/or economic resources and opportunities and/or enhancing voices and rights, which contribute to gender equality and women’s empowerment.

Component 1: Integrated basin planning for the Pungwe - Buzi –Save River Basins

²¹ The Africa Water Vision indicates the need for a minimum: investment of USD 20 billion per annum to meet the basic needs in water supply, sanitation, food, energy and other economic, social and environmental uses; 95% for both access to improved water supply and sanitation by 2025; 100% increase in irrigated area by 2025; and 25% of hydro power potential developed by 2025

²² The Tunis Ministerial Declaration on Accelerating Water Security for Africa’s Socio-Economic Development identifies an Infrastructure platform as key for achieving water security. Specifically ministers pointed out the need to : mobilise investments to attain the necessary water infrastructure, facilitate trans-boundary infrastructure development; develop national plans for achieving water security and strengthen the information and knowledge base

Outcome 1.1: JWC agrees on updated shared water resources Vision and Plan for joint, ecosystem based management of the transboundary Pungwe-Buzi-Save river basins in response to climate variability and change

The aim of this component is to prepare a Transboundary Diagnostic Analysis (TDA)/ Strategic Action Program (SAP) of the Pungwe-Buzi-Save Basins in order to address key sectoral (agriculture, industry, mining, energy, tourism, trade) and environmental issues for promoting sustainable economic growth in the three basins. The component will build on previous analytical work and studies undertaken in the Pungwe basin. The SAP will be endorsed by an inter Ministerial Committee (JWC) in Zimbabwe and Mozambique.

Output 1-1-1: Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) prepared

A Transboundary Diagnostic Assessment will be prepared for the Pungwe-Buzi-Save basins, building on baseline data and past planning processes (monographs) within the three basins. This will be achieved through aligning transboundary work with national priorities and/or ongoing or planned projects and by conducting targeted regional analyses. The TDA will comprise (i) Identification and initial prioritisation of transboundary problems (ii) Gathering and interpreting information on environmental impacts and socio-economic consequences of each problem (iii) Causal chain analysis (including root causes) and (iv) Completion of an analysis of institutions, laws, policies and projected investments.

The TDA will be cross-sectoral and will examine national economic development plans, document the spectrum of relevant projects, programmes and investments that have been approved or are in the pipeline for the forthcoming decade across sectors and the regulatory and institutional framework and sectoral economic policies and practices. A shared knowledge base (Critical habitats and ecosystems; National and regional policy and strategy analysis; sectoral plans and development levels, Water Resources quantity (SW and GW) inventory; Water synergies, balances and trade-offs; Water Quality (salinity, heavy metals, chemical pollutants from artisanal gold mines), Water Resources planning models (USGS stream flow model etc); Water and land resources degradation; Estuarine degradation) will be prepared as part of the TDA.

Two National Intersectoral Committees, will be set up (one in each partner state), with representation from growth sectors (water, agriculture, energy and mining, industry, environment etc) to provide guidance on the regional sectoral priorities and linkages to national planning frameworks.

The TDA will be formally adopted by the JWC Program Steering Committee following requisite technical and stakeholder reviews in order to have official standing. The TDA will serve as the basis to proceed to the Pungwe-Buzi-Save SAP and related National Action Plans for managing and developing the basin's water resources founded on IWRM principles.

Output 1-1-2: Development and adoption of a Strategic Action Program for balancing water uses and sustainable natural resource management in the Pungwe-Save-Buzi basins.

Once priority transboundary concerns are identified by countries in the TDA the two partner States will collaborate in development of the SAP to address those priority concerns. The SAP will serve to identify the investments countries pledge to seek in order to promote economic growth and reduce environmental degradation in the three basins. It will also include a series of annexes giving (1) full details of agreed measures at the national and regional levels (including national policy/legal/institutional reforms and investments) and their implementation mechanisms, process, (2) stress reduction and environmental and living resource status indicators, (3) stakeholders and their involvement in the implementation and review process, and (4) lists of contact points for the responsible authority for implementation in each country.

The SAP process will identify clear requirements for incremental cost funding, which can be translated into proposals in the form of one or more project briefs for downstream implementation. The regional draft SAP will be endorsed in each participant country. This will be conducted under the auspices of the National Intersectoral Committee (NIC), preceded by wide consultation with stakeholders and civil society. A Ministerial Conference will be held to formalise and adopt the national commitment to the regional SAP.

Output 1-1-3: Partnership development and donor partners Conference

The SAP is expected to be catalytic in attracting additional financing for implementation of the prioritised investments. This activity will include holding a partnership conference to enable bilateral and multilateral organizations to review the specific proposals requiring development assistance (including TA, loans and possible equity transfers) and to engage in joint planning for actions to address priority transboundary issues in potential future projects in the three basins. This

approach will involve development partner coordination, as well as leveraging of finance to crowd-in financing from other partners, including member states own resources and the private sector.

Output 1-1-4: Active platform for learning and experience sharing across GEF-IW portfolio and with other GEF-6 relevant transboundary initiatives

Transboundary learning mechanisms, Knowledge Management, communication and awareness building activities will be established at inter-states levels. Experiences will be shared through establishing websites, bi-annual GEF conferences, regional meetings, IW:LEARN, technical papers, World Water Week, Africa Water Week, the African Net basin Organisation (ANBO) and other relevant forums. 1% of the GEF grant is proposed to be allocated to KM, drawing of lessons and outreach/awareness campaign efforts to underpin sustainable river basin management and development.

Component 2: Flood and Drought Warning and Mitigation

Outcome 2-1: Improved capacity of the JWC and RBOs for integrated management of floods and droughts

This sub component aims to improve climate resilience in the basin, primarily through support for the implementation of the Integrated Flood and drought risk management plans in collaboration with other initiatives.

Output 2-1-1: Improved Water Resources information system in support of flood and drought Risk Management

An effective flood forecasting system for the Pungwe-Buzi-Save basins would require basic structures that need to be linked in an organized manner. This would essentially require: (i) Provision of specific forecasts relating to rainfall for both quantity and timing, for which numerical weather-prediction models are necessary; (ii) strengthening the network of manual or automatic hydrometric stations, linked to a central control by some form of telemetry; and (iii) Flood forecasting model software, linked to the observing network and operating in real time.

In order to support flood risk management, this activity will prepare a real-time data collection subsystem for receiving and processing the relevant information is required. This will include meteorological information, discharge data at appropriate gauged sections in rivers (or water levels and rating curves) and from impoundments. This may involve manual or automatic recording gauges, terrestrial data-collection platforms, satellite imagery and extensive use of GIS to present such information in useful format.

This activity will thus strengthen the hydro-met monitoring network/stations by facilitating network designing and prioritisation, installation, trainings and Integrating (including telemetry) and managing hydro-met data by developing and installin a web based portal for data collection, management and storage from all sources within the three river basins. Other useful information that may be collected include: (i) Population and demographic data to indicate settlements at risk; (ii) Inventories of properties at risk; (iii) Reservoir and flood protection infrastructure control rules; (iv) Location of key transport, power and water supply infrastructure and (v) Systematic post-flood damage assessments. For the Hydro meteorological stations installed, letters of commitment would be required from the partner states to ensure continued operation and maintenance of the stations.

Output 2-1-2: Flood Forecasting and Early Warning Systems improved , including hosting, improving and utilizing hydrological and hydraulic flood zone modeling (flood risk mapping) as well as community level early warning systems

This activity will strengthen, agencies in the two partner states (ARA centro and ZINWA-Save) as well as the communities, in flood risk management. The system, will be hosted, operated and maintained by the national agencies responsible for water resources management. This activity would support an integrated hydro-meteorological data visualization platform; weather, climate, hydrological, and flood forecasting and warning systems. The data visualization platform would help visualize archived, real-time, and forecast hydro-meteorological parameters and integrate information from gauging/radar, satellite knowledge products, modeling outputs from global, regional, and community-based disaster surveillance systems. It is expected to also improve the availability of information in the public domain using open data platforms to encourage downstream use of the data for further specialized analysis, dissemination and interpretation. The improved seasonal and short-term weather and climate forecasting would also support the introduction of systematic hydrologic forecasting in the three basins The activity would also put in place appropriate communications, GIS networks and decision support systems, producing forecast details at various levels and map forecasts showing flood inundation in real time. A subsystem for tide or estuary modelling in the case of backwater effects influencing the floods would be supported. This would then also be used for improved hydrologic and hydraulic/routing modeling of the flood zones. This activity would also support flood

early warning systems for communities at risk and disaster management related agencies. Letters of commitment from either government national agencies will be required during project implementation to ensure sustainability of the flood risk management system.

This output will also support the implementation of pilot flood mitigation interventions in high risk communities (details on the flood early warning system for community risks and collaboration with disaster risk management agencies will be made during full proposal development. The aim of this activity would be to support interventions under the project that reduce the vulnerability of selected communities at risk through improved community disaster preparedness, increased flood warning times, and improved planning based on flood mapping and zoning. The proposed investments would support: (i) construction of small- scale flood protection infrastructure (river bank stabilization, culverts, flood diversion structures); (ii) disaster risk awareness raising and planning based on flood mapping and zoning; (iii) community –based adaptation measures, such as flood demarcation, elevated platforms, shelters and safe havens, connectivity to and training on the Flood Forecasting and Early Warning Systems and (iv) pilot investments in ecological flood mitigation and climate resilient livelihoods in critical marshlands in the three basins (specific sites will be selected during the project preparation phase.

Output 2-1-3 Ground Water and drought management mainstreamed into Basin Planning

While the intensity of groundwater use, partly encouraged by various sectoral demands (mining, municipal water supply, agriculture etc), has led to the emergence of groundwater-dependence, their future is now threatened by aquifer depletion and pollution. Prospects for relaxing use of these key aquifers, remediating water quality and restoring groundwater services to ecosystems look remote unless alternative management approaches are developed. Reducing stress on these groundwater systems involves more than groundwater resources management. It requires reducing land-based pollution, rehabilitating degraded habitats and conserving water resources

The aim of this activity would be to assist the JWC and RBOs in carrying out a groundwater resources assessment with particular attention to the interaction between groundwater and surface water, to better understand the functioning of the three river basin systems as a unitary whole, for effective drought management response. The activity will also include strengthening the capacity for drought preparedness, planning and management. The activity would build on some of the result areas from the World Bank GEF financed Sustainable Groundwater Management in SADC Member States Project.

Given the data and information gaps, the activity will obtain valuable data by indirect monitoring of groundwater abstraction through use of remote sensing²³. Knowledge products (Regional Hydrogeological map and Drought Sensitivity Map identifying ecosystems sensitive for groundwater abstractions for aquifers of transboundary significance) would be prepared for regional cooperative management of transboundary aquifers and to guide sustainable downstream investments in proactive drought mitigation (this would subsequently inform downstream actions in the SAP).

The activity would draw lessons from the (i) knowledge & information-sharing on transboundary and national groundwater systems and (ii) legal, policy and regulatory frameworks for ground water management being developed as part of the ongoing Sustainable Groundwater Management in SADC Member States Project, financed by the GEF-World Bank. The extent of collaboration would be ascertained during project preparation.

Output 2-1-4: Operationalisation of data and information sharing and exchange procedures

The Pungwe agreement (July 2016) provides for data and information sharing and exchange, on water quality and quantity and pollution sources and the environmental conditions of transboundary waters. This activity will support implementation of the agreement by development of operational guidelines and strengthening the partner states capacity for data and information sharing and exchange for the three basins on a regular basis. The collection and exchange of relevant data is the basis for effective cooperation in the three basins. In order to inform flood and drought risk management and basin planning, data and information held in the numerous agencies operating in the three basins should be made readily available for use by the basin planners and managers. This will then facilitate the use of various models and analytical tools.

Component 3: Transboundary environmental flow policy and regulatory framework for the Pungwe-Buzi and Save basins strengthened

²³ Satellite imagery or airborne sensors can provide objective measurements at potentially large scales, with quasi-continuous cover at low cost per km². The required images can be obtained from: (i) commercial satellites (such as LandSat), with high resolution images but passing only every 16 days and (ii) specialized meteo-satellites, passing more frequently but generating images at various resolutions

Outcome 3-1: Policy and legal frameworks harmonized and capacity built for improved e-flow management in the Pungwe-Buzi-Save basins . Building on the Pungwe agreement (July 2016)

Output 3-1-1: Policy and regulatory frameworks for e-flow regulation for Pungwe- Buzi basins jointly adopted by JWC building on principles of SADC Water Policy (2006).

The Pungwe agreement (July 2016) expresses the need to implement e-flow management in the three basins. However promoting an e-flow regime would require harmony of the policy, institutional and regulatory steps²⁴. The aim of this activity would be to provide a basis and develop an e-flow management framework for the Pungwe and Buzi basins. This would also include looking at range of international instruments ranging from national water and environmental policies; the SADC regional water policy and more general multilateral environmental agreements such as the Convention on Biological Diversity (CBD). The activity will also include capacity development for RBOs in design/ implementation of e-flow procedures. Lessons from the two basins, would be applied in future phases to the Save basin (given its complexity and level of development).

Outcome 3-2: Strengthened Environmental Flow management Framework for improved decision making in the Pungwe and Buzi basins

Output 3-2-1: E- flows Management for selected catchments piloted to enhance the delivery of environmental services.

The aim of this activity would be to pilot a case study on implementing e-flows within a selected catchment. This is against the premise that e-flows can only ensure a healthy river if they are part of a broader package of measures, such as soil protection, pollution prevention, and protection and restoration of habitats. In the present circumstances difficulties exist in relating changes in the flow regime directly to the response of species and communities in say national parks, within the upper Pungwe basin. The exact location of the catchment, which should be primarily transboundary (in order to demonstrate regional dimensions) to be piloted will be agreed with the two partner states, during the preparation phase.

Output 3-2-2: E-flow operational policies of proposed new/ existing storage infrastructure in the Pungwe –Buzi basins formulated and agreed

The aim of this activity will be to pilot a case study on implementing environmental flows through active or restrictive flow management in one of the basins. The planned water diversion and the construction of hydraulic infrastructure (reservoirs, physical barriers) that are planned in the Pungwe-Buzi-Save systems (example: Muda Dam and Nhacangare Dam on Pungwe River in Mozambique; Pungwe Falls Dam in Zimbabwe) etc. have the potential to alter downstream ecosystems through changes in the quantity and pattern of water flows and the seasonal inflows of freshwater (well established). Less flooding could also mean less sedimentation and deposition of nutrients on floodplains and reduced flows and nutrient deposition in parts of the estuarine zones of the Pungwe-Buzi systems. Implementing e- flows requires planned management of infrastructure such as dams, or a restrictive management, for example through reducing the abstractions. This output will therefore select a pilot location (to be agreed with partner states during project preparation) and prepare allocation policies that ensure that enough water is left in the river, particularly during dry periods, by controlling abstractions, around selected planned infrastructure. The consequences of changing or reducing water flow on biodiversity as well as adverse social impacts such as reduced water availability for vulnerable groups will be analysed upfront.

Output 3-2-3: E-flow operational policies for the Estuarine (mangrove) areas in the Pungwe –Buzi basins formulated

This activity will pilot a case study on implementing environmental flows in the Pungwe-Buzi estuary. This is given the fact that over time, increasing human pressures have led to the degradation of the mangrove ecosystem through pollution and land use change, land subsidence, and effects on ground water quality due to increasing salt water intrusion into their coastal aquifers thereby threatening aquatic biodiversity (UNEP 2006) as well as food security in the estuarine region. Salinity is also an important ecological factor. Freshwater species may be evicted with increasing salinity and replaced by brackish or even marine species. The extent of this pilot will be determined at project preparation. During project design estimates will be made on the the degree to which coastal mangroves provide coastal protection and fish spawning and shrimp habitat benefits.

²⁴ Possible attributes would include : Legal standing for environmental water allocations; Inclusion of environmental water provisions in basin water resources plans; assessment of all relevant parts of the water cycle when undertaking EFAs; agreed methodology for setting environmental objectives in basin plans; attention to both recovery of overallocated systems and protection of unstressed systems; clear requirements for stakeholder involvement; provisions for audits and mechanisms for turning value-laden terms into operational procedures.

4) Incremental cost reasoning and expected contributions to the baseline, and co-financing

The Pungwe IWRM project, the main baseline to the proposed project, is now in its last year of implementation, and many objectives have been achieved. Another baseline project is the IUCN BRIDGE project on environmental flow management and ecosystem resilience which is providing support to the three basins through to 2018.

The proposed project offers cumulative and incremental benefits to on-going initiatives. The proposed TDA/SAP processes are considered incremental to this on-going work in the three basins, given that the countries would not otherwise engage in transboundary, participatory assessment and planning processes without this IUCN/GEF grant, which are critical for operationalizing the recently signed Pungwe agreement (2016).

The planned IUCN/GEF project will play an important role in demonstrating the appropriateness of the proposed ecosystem based approach to basin management and development to two partner states, supporting them as they continue to cooperate on management initiatives for the three basins.

The project will thus have an enormous "leveraging" impact, for the benefit of the national and global environments. The proposed project will ensure coordination among implementing agencies, countries, and other actors, and generates programmatic benefits for the global environment that would not otherwise be achievable. This approach is fully in line with the GEF Operational Strategy for International Waters. Additionally, the project is fully consistent with the Strategic Priorities for the International Waters focal area. GEF support will act as a catalyst for the two partner states to develop a better understanding of how the three river systems function, learn how the actions of their populations in the basins affect the riversine and estuarine environment, and work out ways jointly with one another to implement a comprehensive approach to managing the basin ecosystems to achieve global environment benefits. The GEF support is also required to cover the incremental costs associated with regional cooperation, capacity building and the definition and introduction of improved groundwater management systems.

Success in the current project will lay the foundations for longer term benefits for the two partner states. For example, if the long-standing barriers to regional flood and drought risk management can be overcome, the implementation of water management and development programs will eventually contribute to a more sustainable ecosystem based management, as well as conservation of the rivers aquatic biodiversity. Thus, without the IUCN/GEF project the ecosystem approach might not be mainstreamed into basin management and development.

There are, however, significant transaction costs which act as barriers to achieving these benefits (inadequate and differential institutional capacity, information and scientific understanding of the ecosystems and balanced development). The costs of overcoming these barriers are therefore truly incremental. So too are the costs of actions to achieve additional global benefits, such as management of flood risks.

5) Global environmental benefits (GEFTF) and/or adaptation benefits

The project will enhance the *level of transboundary collaboration among the two countries (Zimbabwe and Mozambique) which will reduce the threats, to the three international water systems*. This will ensure that water resources and ecosystems in the basins concerned by the project are managed and utilized in a relevant manner in the long term and assurance that economic growth maintains a sustainable pathway. Mechanisms will be developed to promote appropriate allocations among competing uses, equitable distribution of benefits and burdens, adequate involvement of both women and men and community participation in addressing sustainability in water resources management.

The project will contribute towards the reduction of pollution load in international waters from nutrient enrichment and other land-based activities. The two States recognize the ongoing deterioration of the shared natural resources within the three basins and through signing the Pungwe agreement recognize the need to reverse degradation and implement move towards environmentally sustainable growth through adoption of principles of the water-food-energy-ecosystem nexus, as well as institutionalizing environmental flow requirements. The project aims to start a process that will support the trend support sustainable natural resource management and protection of the environment (especially the critical habitats like the National Parks, with a variety of biodiversity of global significance) and promotion of alternative income sources, diversification of welfare. Women will be particularly encouraged to take a leading role in project implementation as well as being part of various committees.

Through formulation of a framework for flood and drought risk management, improvement of the water resources monitoring system and development of modelling tools for enhanced flood forecasting, the project will contribute towards

reduced vulnerability to climate variability and climate-related risks, and increased ecosystem resilience. Management and mitigation strategies will be developed to minimize the potential impacts of variability in water resources availability resulting from extreme climate events (drought, floods) or long-term climate changes.

The project will also contribute towards sustained freshwater, coastal, and marine ecosystems goods and services, including globally significant biodiversity, as well as maintained capacity of natural systems to sequester carbon. In the Pungwe-Save-Buzi basins, this project, through specific investments in management of environmental flows around existing and planned hydraulic infrastructure, catchment management and critical habitat restoration, capacity development, the provision of information and support to governance processes, seeks to promote climate resilience growth. Improvement of subsistence farming and salinity management in the estuarine areas will significantly improve livelihoods.

The project will additionally *promote gender equity in the areas of management, governance, and policy development.* The project will emphasize cross-sectoral, integrated ecosystem approaches that rely on consultative processes and equity in gender participation. Socio-economic activity in the project area already includes significant participation of women. Project efforts to ensure sustainable use and protection of water quality will contribute to sustaining livelihoods and the important roles that women play in them. Finally, community participation in conservation will increase sustainable practices and better protection of natural resources.

6) Innovation, sustainability and potential for scaling-up

Innovativeness

The project is structured around a water-food-energy-ecosystem nexus approach, which is key to balanced ecosystem based poverty-reducing economic growth in the Pungwe-Save-Buzi basins. The increasing competition over water highlights the difficult policy choices that are posed by the water-food-energy-nexus and the trade-offs involved in managing each sector, either separately or together. These three pillars of any functioning society are closely interlinked, and choices made in one area will inevitably impact the choices and hence resources available in the others (WWAP, 2014).

The use of remote sensing—satellite or airborne sensors to provide a baseline for monitoring groundwater abstraction and use is an innovation, which which help to overcome the limited data on ground water monitoring in the three basins in order to mitigate droughts in the basins. The technique can provide objective measurements at potentially large scales, with quasi-continuous cover at low cost per km², and its success will provide opportunities for replication. In other basins in Africa. The project will also update knowledge bases to include ground water management, water quality management and salinity management in the estuaries. Analytical tools for water quality and quantity and ecosystem management. will also be updated to enhance decision-support capabilities for the JWC and partner states.

The project will also explore the use of hydrodynamic tools to assess the severity and impacts of salt water intrusion in the estuaries. This will be key, given the data-poor environments that are typical of the three basins. This will also address the fact that the pace of development and scope of water quality problems almost always grow faster than any ability to build and sustain in-country capacity. The tools will place domain knowledge into the hands of local practitioners in such a way that water and environmental managers are guided through decision making.

The project recognizes, that there is no single best method, approach or framework to determine environmental flows, given the varying habitat requirements as well as existing and potential uses in the three basins. The project will thus adopt innovative approaches. Building on the Pungwe agreement, the planned environmental flow policy and regulatory framework will be formulated and capacity built among various agencies in designing and implementation of e-flow procedures. This innovation is expected to be replicated in other basins within SADC and Africa.

The project will take into account gender concerns considering the fact that the issue of ecosystem degradation and natural disasters (flooding) affects differently men and women and vulnerable groups (children, young and old). The dissemination and sharing of information will be developed and disseminated in order to ensure that women and girls - especially those who are poor or who were denied the right to education - can easily have access to the necessary information. During the formulation phase of the project, a social development expert will be recruited to systematically analyze and address the issues relating to the specific needs of women and men, and the targeted interventions to enable women and men to participate -in the basin ecosystem management efforts.

Sustainability and potential for scaling up

The project addresses key regional, national and local development priorities spelled out in various monographs, information data bases and IWRM plans in the Pungwe-Buzi-Save and save basins. The project also builds on a strong legal foundation, following the signing of the Pungwe Agreement (July 2016). The Agreement has strong dimension on ecosystem management, which strengthens the JWC, the RBOs capacity to implement the agreement.

The project contributes towards the SADC Regional Water Policy and Strategy, to which Zimbabwe and Mozambique have shown strong commitment. Further, the planned results have been mainstreamed within national priorities and build on strengthened existing decentralized catchment management structures like the ARA-Centro and Zinwa-Save, which provides prospects for sustainability of benefits. IUCN will continue to engage counterpart staff in project planning and management. The focus on capacity building will generate a critical mass of technical experts that can be utilized for future replication in the partner States. The strong capacity building and participation of local stakeholders in project activities will also contribute to sustainability.

Technically, the project is structured to foster ownership, enhance coordinated basin management and ensure long-term sustainability for water resources and ecosystem management in the Pungwe-Buzi-Sava river basins. The two partner states, under the JWC, and under previous programmes financed by Sweden International Development Agency and the IUCN, have strengthened institutional arrangements for enhanced program sustainability. The design principles of the project, also build onto existing experiences on integrated basin ecosystem based planning in the the SADC basins of the Komati and the Okavango basins. In particular, this Project will provide lessons for application in other basins facing similar ecological flow management challenges in the SADC region in general and Africa as a whole.

The project will explore financial and sustainability measures with respect to the project, which include but are not limited to cost avoidance and cost-reduction, the use of new cost-effective technologies for monitoring, control and surveillance and a variety of donor/public/private sector linkages that focus on commercial benefits that permit off-loading of monitoring and assessment from government to the private sector. The two partner states provide counterpart contributions in-cash and in-kind (counterpart staff and office space), which is a sign of commitment to the program's objectives. This incremental contribution will contribute towards sustainability of the project results.

To address multiple level challenges associated with (sporadic) violence in the upper pungwe and Buzi basins, the project will support training activities, consultative forums, joint and shared responsibilities, and the promotion of users associations to help in conflict prevention and resolution.

7) Stakeholders Involvement Gender Equality and Women's Empowerment.

IUCN recognizes the importance of involving a wide range of stakeholders in the preparation of projects. This improves the effectiveness, relevance, and sustainability of development programs, and contributes to good governance. Within IUCN promoted programs, social analysis and stakeholder consultation are an essential part of project preparation and an integral part of the project design process; it contributes to the technical analyses, allows the identification and avoidance of potential negative impacts of project activities on specific social groups (e.g. vulnerable or marginalized groups) and the inclusion and empowerment of disadvantaged groups.. Key stakeholders within the project area include the local communities, NGOs, government ministries, private sector, as well as other regional programs and projects.

Reducing gender inequalities and empowering women to participate more fully in social-economic growth are recognized as essential to reducing poverty and achieving development goals within the two partner states. During project preparation, gender analysis will be undertaken to identify (i) gender disparities that may affect the feasibility and success of the project; (ii) potential risks where the project might inadvertently aggravate inequalities, (iii) opportunities within the project to improve women's access to basic services, economic opportunities or decision making; and (iv) specific components or other mechanisms to ensure that both women and men participate in and benefit from the program/project.

Details on stakeholder categories are shown in the table below.

Category	Mozambique	Zimbabwe
Regional	SADC Water Division, SADC Directorate on Food, Agriculture and Natural Resources	
Basin	Joint Water Commission Pungwe Programme Steering Committee Pungwe Programme Management Committee	

Category	Mozambique	Zimbabwe
Government Departments	Department of International Rivers, National Directorate for Water Affairs (DNA), Ministry of Public Works and Housing; Departments of Environmental Affairs	Department of Water Development and Management, Ministry of Environment, Water and Climate
Quasi-Government	ARA-Centro	ZINWA
Provincial Offices	Gaza, Inhambane, Sofala and Manica	Masvingo, Manicaland, Mashonaland East, Matabeleland South and Midlands
District Councils	Massangena, Inhassoro, Govuro, Mabote, Machanga, Machaze	31 Rural District Councils
Basin Committee	Pungue, Save and Buzi	Save, Runde
Sub-basin Committee	Nhazonia, Gorongosa	12 sub-catchment councils
Towns	Chimoio, Beira	Mutare, Gweru, Masvingo, Shurugwi, Zvishavane
Non governmental organisations and Civil society	WaterNet, Global Water Partnership Southern Africa, Africa Net Basin Organisation ANBO	
Private sector ²⁵	Farmers, extractive mining companies, national parks, fishers, private sector,	
Development partners	Sida PP2 Programme, DFID-CRIDF	

The expected roles of the stakeholders are outlined in the table below:

Main interveners	Expected roles in Project preparation
JWC and Regional Project Steering Committee	<ul style="list-style-type: none"> • Coordination of the project preparation process • Facilitate involvement of countries and stakeholders participation in identification of project activities and institutional arrangement; • Secure Letters Co-financing from development partners; • Facilitate organisation of the validation meeting for the project document at national and local levels • Provide technical input in the Project Document
Ministries responsible for of Water Resources and Environment Department of International Rivers, National Directorate for Water Affairs (DNA), Ministry of Public Works and Housing; Departments of Environmental Affairs Department of Water Development and Management, Ministry of Environment, Water and Climate	<ul style="list-style-type: none"> • Participate in meetings for the identification and validation of Project key actions; • Contribute technically in the project document during Project preparation • Facilitate the involvement of national partners
Quasi-Government ARA-Centro (Mozambique) and ZINWA (Zimbabwe)	<ul style="list-style-type: none"> • Identification of project activities and institutional arrangement • Contribute in the elaboration of project documents
District Councils Massangena, Inhassoro, Govuro, Mabote, Machanga, Machaze (Mozambique) 31 Rural District Councils (Zimbabwe)	<ul style="list-style-type: none"> • Identification of project activities and institutional arrangements • Facilitate the participation of local communities, specifically women
Civil Society	<ul style="list-style-type: none"> • Participation in stakeholders consultations • Contribute in the designing of Prodoc
Technical partners, regional programs and projects	Create a synergy among their on-going programs and contribute to the project Contribute in the preparation of project documents
Private sector	Extracting industries and other polluting industries

8) Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks

The two partner States are committed to achieving the Project's development objectives. They are also committed to sustaining its activities and implementing the lessons learned after Project completion. The main risk is that the commitments by the Governments will fail to sustain a regional environmental management program for the three basins. This may express itself through inadequate budgetary arrangements to fund the proposed RBOs or coordinating agencies, erosion over time of the powers given to such institutions, or unwillingness or lack of capacity to follow-up on regional regulatory decisions or guidelines (like the proposed environmental flow policy) through enforcement at the national level.

²⁵ Private Sector engagement will be key in maintaining environmental flows (quantity) and water quality

However, since the governments have collaborated well during the Pungwe program preparation, and the proposed program provides many opportunities for low-risk collaboration on technical issues, which should build confidence steadily during implementation, the main sources of warning commitment would seem to be external to the program. Emergent risks are categorized into institutional, socio-economic and environmental risks, and for each potential risk, a mitigation strategy is developed, as reflected in the Table below.

Risk	Rating	Mitigation Measure
Institutional Risks		
Riparians do not successfully establish a transboundary e-flow policy and regulatory framework for the Pungwe-Buzi-Save basins.	Moderate	The recently signed Pungwe agreement, recognizes the urgent need to consider environmental flows, in light of the eminent water for socio-economic growth that is planned within the basin. This demand driven approach will improve the chances of success of implementation of the e-flow procedures
<i>Political Risk</i> —The long term success of regional scale an ecosystem base river basin approach in the Pungwe-Buzi-Save basins depends on the political willingness of the participating countries (Mozambique and Zimbabwe) to cooperate, their willingness to build capacity, share information and enforce e-flow regulations, within planned programs. Parts of the region have also in the past witnessed recent national strife and, lack of donor support, and short term priorities such as human health, education, basic sanitation, and nutrition, it might be difficult to create a focus on what appears to be longer term environmental imperatives.	<i>Moderate to high.</i>	The countries, notwithstanding the focus on short term priorities at the expense of environmental integrity, are increasingly committed to a regional approach to shared environmental concerns as a means of ensuring sustainability of their shared, fragile resources. Issues of governance and political instability may compromise the project. However, there are definite signs of improvement in both countries towards democracy and stakeholder participation. The exit strategy for the IUCN/GEF in this project is to predicate further involvement in a SAP implementation project to strong country and PuBuSa performance during the life of this intermediate project.
<i>Basin Coordination Agency:</i> IWRM in river basins is multi sectoral in nature, and involves coordinating activities across a large number of public, private and donor agencies. Creation of a Basin organization following the signing of the Pungwe Agreement (July 2016) will be a new step for the JWC. Whilst multi-sectoral planning should produce synergies in most cases, there remains a risk that individual stakeholder agencies (national parks, water supply utilities, estuarine conservation agencies) may feel that their actions are being constrained and therefore oppose the ecosystem based basin planning process	Moderate	Design of the institutional structure of the expected basin management agency is proposed to be undertaken supported by Sweden. It takes into account the need for sufficient status of the agency and representation of key stakeholders. The IUCN/GEF project will also improve the knowledge base for decision making, including real-time spatial tracking of development activities within the Basin. It will make the knowledge base public and include a program of development communication which will increase understanding and the onus on stakeholders to engage constructively.
<i>Differential National Capacity:</i> Different pace of project implementation among the countries (one country falling behind and dragging efforts of others) due to varying capacity	High	A flexible project design will allow countries and implementing agencies of components to move at different pace depending on their capacity. Budgets are allocated for capacity building of national institutions. This will build on the ongoing bridge efforts in capacity building for e- flows in the Pungwe and Buzi basins
<i>Community involvement</i> -There are several complexities and risks of failure involved with work at the community level: Livelihoods-based catchment management at the community level or conservation of the natural habitats like forests or work within estuarine regions is often unsustainable if designed without taking into account socio-economic conditions and making sufficient investments in local capacities and institutions. Participatory management of natural habitats may fail if sustainable uses promoted (e.g. community agro-forestry) do not provide sufficient incentives or income to overcome short term resource depletion incentives. Community NRM objectives may not be met if activities are not suitably gender-targeted, or may not be sustained if youth groups are not involved.	Moderate	Strong community leadership and building interest are key determinants of success. Pilot investments for instance in flood risk management would follow an in-depth social analysis and participatory planning conducted with local leaders and stakeholders representing the range of needs and priorities of the targeted population. Pilot interventions will be pragmatic, exploring a range of options and emphasizing multiple revenue streams where possible, including ongoing government support and global conservation funding. Community engagement will emphasize the participation of women along with enhancing opportunities of other vulnerable groups. The project will promote women's active participation in local institutions.
Socio-economic Risks		
<i>Ecosystem based Management</i> —Investments in ecosystem and catchment management are long term by nature, and their impact is difficult to monitor and dependent on a critical	Moderate	The program is explicitly designed with an initial phase concentrating activities to show demonstrable impact in selected hotspot ecosystems that demonstrate various

Risk	Rating	Mitigation Measure
mass of activity being achieved		techniques in environmental flow management and other targeted areas that are critical for maintenance of ecological infrastructure. This approach will allow local experience to be gained and lessons learned to guide scaled up operations in later phases.
<i>Lack of long-term financial commitments and sustainability</i> — The risk of IUCN/GEF project programs, and activities related to them, ending after the life of the project. It is unlikely that the countries can, without greater donor support than is now the case, sustain project efforts.	Substantial	The IUCN PuBuSa project is included in the countries' rolling Mid-Term Expenditure Frameworks and mechanisms would be developed under the project for sustainable financing, such as Payment for Environmental Services, Carbon Finance, and Environmental Taxes. The ability of the countries, Sweden and GEF assistance, to solicit donor support will be crucial to sustainability of project efforts.
Environmental risks		
<i>Climate change</i> —Vulnerability to changing environmental conditions Climate change impacts are larger than anticipated levels. The region is likely to face more droughts and floods	Moderate	The project is flexible enough to function under changing conditions. An improved water resources information system, will also promote climate resilience growth planning in the basin. Other measures will include: adoption of “no-regrets” approaches in all IWRM and Sustainable ecosystem management Practices and participatory M & E of climate parameters and adaptation options.

9) Coordination. Outline the coordination with other relevant GEF-financed and other initiatives.

The project will be implemented under the auspices of the Joint Water Commission. Both Government of Mozambique and Zimbabwe will be represented in the project steering committee through their Ministry of Environment (represented in the Joint Water Commission). Countries will nominate relevant national technical bodies to be part of the project steering committee if need be. This will be detailed during the project preparation phase.

The project will be implemented in full alignment with the Pungwe Programme, in particular its potential third phase, which has been determinant in structuring the Joint Water Commission and preparing the first Pungwe, Buzi and Save Integrated Water Resources Management Strategies and Monograph with the financial and technical support of SIDA (Sweden International Development Agency).

Other GEF interventions for which coordination will be sought include the GEF / SIWA financed SADC Groundwater Management Programme. The extent of collaboration will be clarified during project preparation.

IUCN is the partner agency that the Governments of Mozambique and Zimbabwe have selected, following recommendation of the Joint Water Commission, to implement this project. IUCN is active in Mozambique and Zimbabwe on IWRM projects, through its BRIDGE and SUSTAIN initiatives. This makes IUCN one of the key partner in the sector since it is involved on the main river basins (including Zambezi basin) that are transboundary between Mozambique and Zimbabwe. IUCN will ensure that the project is coordinated with all other Integrated. This position confers to IUCN a privileged role in the sector of River Basins Integrated Water Resources Management.

10) Consistency with National Priorities.

Alignment with PRSPs

The IUCN GEF project is aligned with the Poverty Eradication Action Plan (PEAP) for Mozambique and economic policy frameworks for Zimbabwe. These strategies emphasize healthy ecosystems, poverty reduction and sustainable economic growth. They also identify degradation of natural resources as a key impediment to attainment of results. The project will contribute towards addressing these concerns. In particular the Mozambique PRSP, notes that looking ahead, a number of problems will need resolution if recent strong growth is to be maintained-given that some of the increase in output is due to “catch-up” after the 2000 floods. In particular, the coverage of extension services is still limited, hence the importance of the outsourcing pilots.

Alignment with the National Water Policies

The main instruments underpinning the water sector in Mozambique are the Water Law (1991) and the National Water Policy (1995). The Water Law is the most important legal document concerning water resources management in Mozambique. It establishes water resources that are public domain, are within the competences of the Government to manage. The Water Law advocates cooperation with the other watercourse states to ensure a coordinated management frameworks for the shared river basins. This is reinforced by the signature and ratification by Mozambique of the SADC Protocol on Shared River Basins. The National Water Policy defined the main policies: satisfaction of basic needs, participation of the beneficiaries, water prices to reflect the economic value of water, regulation and monitoring of service providers, principle of integrated water resources management, water resources development plans for the major river basin and priority to reach agreements with other riparian States in shared river basins, de-centralization of water resources management at the operational level to autonomous regional water administrations (ARAs).

The overall goal of the Zimbabwe National Water Policy which was developed in 1998 is to promote the sustainable, efficient and integrated utilization of water resource for the benefit of all Zimbabweans. The National Water Policy also embraces IWRM and one of the key policy statements is on promoting stakeholder participation in the planning, implementation and management of water resources so as to ensure sustainability in the management of the water resources. The Zimbabwe National Water Authority (ZINWA) was established in terms of the Water Act No 11/98 and is responsible for the development and management of the national water resources in Zimbabwe. It is meant to operate on a self-financing basis. In addition to establishing ZINWA, the Water Act introduced a number of new principles in the management of water resources. The main ones were: no private ownership of water, water rights are no longer given in perpetuity, water permits are revised with consideration taken to the basin wide water use, no differentiation in management between surface and ground water, and the establishment of Catchment Councils. Other noteworthy changes were the introduction of water permits, fees for applications for permits as well as for the commercial use of water

Alignment with individual sectoral policies and plans on environment, water resources, agriculture, energy and industry etc, in each of the partner states will be further explored during the full project proposal development phase.

Alignment with Ramsar Convention

The two countries are signatories to the Ramsar Convention. This is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The convention also has resolutions on River basin management, climate change, extractive industries, which are relevant within the context of the proposed project. The convention entered into force in Zimbabwe on 3 May 2013. Zimbabwe currently has 7 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 453,828 hectares. The convention entered into force in Mozambique on 3 December 2004. Mozambique currently has 2 sites designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 4,534,872 hectares. By being signatories, the two partner states the two partner states commit to conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world. Through ecosystem based management, the project will promote principles of the Ramsar convention.

Alignment with Sustainable Development Goals

The project will contribute towards attainment of the sustainable development goals by the two partner states of Zimbabwe and Mozambique. As example, by promoting flood and drought risk management, the project will, contribute towards goal 1 on poverty, by building the resilience of the poor and those in vulnerable situations, and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters. The project will also contribute towards goal 6 on ensuring availability and sustainable management of water and sanitation for all, through measures such as : protecting and restore water-related ecosystems, including forests, wetlands, rivers and aquifers; Promoting transboundary cooperation; improving water quality by reducing pollution and managing water scarcity due to drought, through improved ground water governance and drought resilience.

Alignment with National Climate Strategies

The Government of Mozambique approved a National Strategy on Climate Change (2012), which summarizes the actions towards adapting and mitigate recurrent extreme events in vulnerable areas. These include: i) Adaptation and climate risk management; ii) Water resources; iii) Agriculture, fisheries and food security and nutrition (SAN); iv) Social protection; v)

Health; vi) Biodiversity; vii) Forests and viii) Infrastructure. The WMO (2015) states that due to the transboundary nature of the Zambezi river water resources management, sharing information and the establishment of strong river basin institutions are elemental for mitigating and adapting to climate change. As established in the National Climate Change Adaptation and Mitigation Strategy (NCCAMS) (MICOA, 2012), the national priority is defined in its mission “to increase resilience in the communities and the national economy including the reduction of climate risks, and promote a low-carbon development and the green economy through the integration of adaptation and mitigation in sectorial and local planning”. The planned project is therefore in line with the Mozambique INDC.

The planned project also in line with with the Zimbabwe INDC Zimbabwe which seeks to build resilience to climate change whilst ensuring sustainable development in recognition of its climate change vulnerability and national circumstances. In presenting its INDC, Zimbabwe seeks to contribute to an ambitious goal of limiting temperature rise to below 1.5oC. The global climate target is to prevent dangerous anthropogenic interference with the climate system so as to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

Alignment with the United Nations Convention on Biological Diversity (UNCBD)

Zimbabwe is party to the United Nations Convention on Biological Diversity (UNCBD) and accordingly has obligations to implement the provisions of the convention. In 2013, Zimbabwe launched the development of its second-generation National Biodiversity Strategy and Action Plan (NBSAP) to address some of the threats facing biodiversity in the country as well as fulfilling its obligations under the United Nations Convention on Biological Diversity (UNCBD) and the Aichi Biodiversity Targets. In 2003, Mozambique embarked on the development and implementation of the National Strategy and Action Plan for Conservation of Biological Diversity (2003-2010). The mission for this strategy was defined for the next 20 years: "To ensure the conservation of biodiversity through the integration, training, financing and the strengthening of partnerships between the different sectors of society." The plan addresses biodiversity issues considering synergies with other important instruments such as the National Strategy for Adaptation and Mitigation of Climate Change and the Strategy and Action Plan to Combat against Drought and Desertification.

Alignment with regional policies and strategies

Zimbabwe and Mozambique are party to a number of regional and international conventions/ protocols that promote sustainable natural resources. Of particular significance is the SADC protocol of which the two countries are party. Key issues to be addressed under this are the equitable and reasonable utilisation of shared water resources, the obligation not to cause significant harm to co-riparian’s interests, and information sharing. These issues remained mostly unimplemented till date. IUCN/GEFs involvement as neutral third party will help contribute to the achievement of these commitments and compliance with international treaties. The project is aligned to the SADC Regional Indicative Strategic Development Plan (RISDP), adopted in 2003, which constitutes a strategic framework for deeper regional economic integration and social development in the SADC region. RISDP provides strategic direction for the efficient implementation and delivery of the SADC Programme of Action over a period of 15 years. It aligns the overarching long-term integrated development goals and objectives with discrete policies and priority intervention areas, while enhancing and strengthening inter-sectoral linkages and synergies in order to accelerate poverty eradication in the region. It is a crosssectoral plan in which significant emphasis has been placed on water through the updated RSAP-IWRMD. In it the cross-sectoral nature of water in the development process has been underscored: poverty reduction, food security, provision of energy, securing good health

11) Knowledge Management

A robust and trusted knowledge base is key to implementing cooperative transboundary water management in the Pungwe-Buzi and Save basins. Knowledge should inform riparian perceptions of the costs and benefits of cooperation, and is therefore a crucial element in motivating transboundary management. A shared understanding of the three river systems among key stakeholders as well as river basin planners is crucial for diminishing information asymmetries that engender mistrust, and for generating evidence-based options for cooperative management.

Incremental IUCN/GEF support would provide for strengthening the management of water resources as well as ecological and biodiversity knowledge in the basin, based both on the information generated under the TDA and other existing and ongoing data generation.

Existing information on basin ecology will be collated and a spatial meta-database will be developed to organize and provide access to it. The RBOs (ZINWA-Save and ANR) will receive support to improve their in-house knowledge

management, to allow them to link their data resources to the meta database. Information products will be developed from this knowledge base both to reflect the value of natural ecosystems to the hydrology and economy of the Pungwe, Buzi and save basins, and to provide field guides and interpretive materials for protected areas.

During preparation, considerable attention would be paid to developing a spatial knowledge base with the best available local, regional, and global datasets. This will in turn inform the TDA/SAP and other processes by making maps and atlases of areas of interest as well as to undertake spatial analysis on erosion modeling to help prioritize catchment areas.

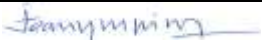
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. Record of Endorsement²⁶ of GEF Operational Focal Point (s) on Behalf of the Government(s): **(PLEASE ATTACH THE OPERATIONAL FOCAL POINT ENDORSEMENT LETTER(S) WITH THIS TEMPLATE. FOR SGP, USE THIS SGP OFP ENDORSEMENT LETTER).**

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Ms. Marilia Telma Antonio MANJATE	GEF Operational Focal Point, Mozambique	Ministero Da Terra, Ambiente E Desenvolvimento Rural	JULY 22, 2016
Mr. I.D Kunene	GEF Operational Focal Point, Zimbabwe	Ministry of Environment, Water and Climate, Zimbabwe	JULY 19, 2016

B. GEF Agency(ies) Certification

This request has been prepared in accordance with GEF policies²⁷ and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

Agency Coordinator, Agency name	Signature	Date (MM/dd/yyyy)	Project Contact Person	Telephone	Email
Jean-Yves Piro		07/25/2016	Cathrine Mutambirwa		cathrine.mutambirwa@iucn.org

²⁶ For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

²⁷ GEF policies encompass all managed trust funds, namely: GEFTF, LDCF, and SCCF

C. Additional GEF Project Agency Certification (Applicable Only to newly accredited GEF Project Agencies)

For newly accredited GEF Project Agencies, please download and fill up the required [GEF Project Agency Certification of Ceiling Information Template](#) to be attached as an annex to the PIF.

Date: 25 July 2016

To: The GEF Secretariat
Washington, DC 20433

Subject: GEF Project Agency Certification of Ceiling Information

Per Council requirement for GEF Project Agencies, I am pleased to inform you that:

- (a) the value of the largest project implemented (or executed) by IUCN to date is USD 27.4 million²⁸; and
- (b) the total value of all projects under implementation by IUCN as of the end of FY 2015 was USD 366 million.²⁹

I certify that the GEF financing currently being requested by IUCN for the project, “Strengthening transboundary cooperation and management of competing water uses and associated ecosystems in the Pungwe, Buzi & Save Basins”, in the amount of 6,000,000 USD, is lower than the largest project that IUCN has implemented (or executed) to date.

I further certify that the total amount of GEF financing currently under implementation by IUCN plus the requested GEF financing for the above mentioned project does not exceed 20 percent of the total amount of all projects that IUCN had under implementation as of the end of FY 2015.

Sincerely,



Jean-Yves Pirot
GEF Coordinator
IUCN

²⁸ This amount excludes co-financing.

²⁹ In support of these statements, a copy of (a) the signed loan/grant agreement for the largest project implemented (or executed), and (b) a list of all projects (together with their amounts in US dollars) need to be sent via email, under a separate cover, to the GEF Secretariat at Project_Agency@theGEF.org. These supporting documents will be treated as confidential and will not be shared with any parties external to the Secretariat. The PIF will not be approved in the absence of these supporting documents.

Appendix 1 – Pungwe Water Commission Institutional Structure

The Joint Water Commission

The Governments of Mozambique and of Zimbabwe established a Joint Water Commission Concerning Water Resources of Common Interest (JWC), to combine efforts in creating an effective trans-boundary IWRM&D mechanism. This JWC comprises the Minister of Public Works and Housing and Water Resources from Mozambique and the Minister of Environment, Water and Climate from Zimbabwe, is the formal authority governing the Pungwe Programme. The Commission is supported at a strategic level by the PSC.

As the JWC is the supreme policy and decision making body the JWC gives direction and guidance to the PSC in the discharge of its oversight mandate. When the Pungwe Bi-lateral Agreement between Mozambique and Zimbabwe becomes operational, it is expected that the role of the JWC will be expanded to include: (i) Promotion and overseeing the implementation of joint programmes and projects (ii) Resolving conflicts or disputes and (iii) Promoting and assisting in the harmonization of national water policies and legislative measures

The Programme Steering Committee

The Programme Steering Committee (PSC), formed under PP1, has been largely retained in its present form (although some of its members have changed) but with additional representation from the Save Basin stakeholders. Currently it consists of representatives from DNA, MEW&C and ZINWA as well as from the PBC (Mozambique) and Save Catchment Council (PSCC, Zimbabwe). During 2015, there were some changes to the composition of PSC members from both Mozambique and Zimbabwe. The PSC provides overall guidance and monitoring of the programme, similar to the way this has been done during PP1. Sida remains an observer in the PSC. In addition, the ARA Centro Director General, ZINWA Catchment Manager and PM are resource persons to the Committee

The Project Management Committee

The Programme Management Committee (PMC), consisting of the Director General of ARA-Centro and the ZINWA-Save Catchment Manager, with two senior staff members of ARA-Centro and one from ZINWA-Save as observers. The PMC is responsible for decisions taken at operational level. The PMC also includes the PM as a resource person. The PMC is responsible for the day-to-day running of the programme; it facilitates the resolution of technical and financial issues arising from the implementation of PP2. The PMC reports to the PSC. The PSU assists the PMC in planning, coordinating, facilitating, managing and monitoring of PP2 activities. The PMC normally meets once per month.

The Programme Support Unit

The Programme Support Unit (PSU) falls between a traditional external PMU and a situation in which Programme management is fully integrated into an existing institution. The management framework for the Pungwe Programme differs markedly from that under PP1 in which the project as a whole was put out to international tender and subsequently implemented and managed by a consultancy firm. The PSU is located in the same offices as ARA-Centro, and although its primary task would be to efficiently and effectively facilitate Programme coordination, part of its terms of reference is to support and strengthen the relevant basin institutions (especially ARA-Centro) to assume and sustain their respective roles and responsibilities with regard to IWRM&D in the basin. The Programme Support Unit has the following staff: (i) Programme Manager (PM) (ii) Finance Officer (FO) (iii) Procurement Officer (PO) and (iv) Support staff (Administrative Assistant and Driver)

The PSU staff are administered by the ASP, while remaining accountable for their substantive work performance to the PMC. As part of capacity building, PP2 Finance and Procurement Officers are involved in hands on training with ARA Centro staff in the department of Finance, Administration and procurement. IDA is also providing training as well as mentoring staff at ARA Centro. PM on a daily basis works closely with ARA Centro and ZINWA Save management in the planning and execution of activities as per approved workplan.

The role of the Consultative Groups

The Program has critical development projects that are multi-sector in nature. Consultative Groups (formally called Working Groups) were initially formed during Inception with representatives from a wide range of stakeholders - from government ministry level to the actual water users within the basin. The Consultative Groups provide a fora for critical inputs and guidance on the implementation of a particular project. They are chaired respectively by an identified lead agency substantively related to the focus of the project. The chair of each Group is agreed upon by the Group members. A staff member from ARA-Centro and/or ZINWA-Save participates in most of the Consultative Groups and as far as possible acts as secretariat to these Groups (often with assistance from the PSU). Consultative Groups report to ARA-Centro/ZINWA-Save. Their meeting costs are born by the programme.