GLOBAL ENVIRONMENT FACILITY
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CEO Endorsement (CEO) entry – Full Sized Project – GEF - 6

Management of Competing Water Uses and Associated Ecosystems in Pungwe, Busi and Save Basins

Part I: Project Information

GEF ID
9593

Project Type
FSP

Type of Trust Fund
GET

Project Title
Management of Competing Water Uses and Associated Ecosystems in Pungwe, Busi and Save Basins

Countries
Regional

Agency(ies)
IUCN

Other Executing Partner(s):
Global Water Partnership (GWP)

Executing Partner Type
Multilateral

GEF Focal Area

International Waters

Taxonomy

Transboundary Diagnostic Analysis, International Waters, Focal Areas, Freshwater, River Basin

Rio Markers

Climate Change Mitigation

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 1

Duration

48In Months

Agency Fee($)

540,000

A. Focal Area Strategy Framework and Program

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount($)	Co-Fin Amount($)
IW-1_P1	Foster Cooperation for Sustainable Use of Transboundary Water Systems and Economic Growth	GET	2,026,457	10,000,000
IW-2_P3	Advance Conjonctive Management of Surface and Groundwater through Effective Institutional, Legal and Policy Measures	GET	1,364,892	2,306,426
IW-2_P4	Addressing the Water/Food/Ecosystem Security Nexus	GET	2,608,651	30,000,000
		Total Project Cost($)	**6,000,000**	**42,306,426**

B. Project description summary

Project Objective

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 Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing($)	Confirmed Co-Financing($)
Component 1: Flood and Drought Warning and Mitigation	Technical Assistance	Outcome 1.1. Floods and droughts management in the Pungwe, Save and Buzi basins is improved and related risks mitigated	Output 1.1.1. Improved water resources monitoring, warning and information system in support of flood and drought risk management	GET	2,842,950	3,385,000
			Output 1.1.2. Flood risk & vulnerability characterised			
		Outcome 1.2 - Improved national and transboundary capacity for integrated management of floods and droughts	Output 1.2.1 - JWT, member States and communities' capacities for flood and drought management strengthened			
			Output 1.2.2 - Project progress towards outcomes documented and shared with all stakeholders			

Output 2.1.1 - Shared diagnosis of ecosystems status, functioning and economic value established

Output 2.1.2 - Strengthened Environmental Flow management Framework for improved decision making

Output 2.1.3 - Project progress towards outcomes documented and shared with all stakeholders

Component 2: Conserving and restoring ecosystems for sustainable livelihoods	Investment	Outcome 2.1 - Improved water ecosystems of the Pungwe, Save and Buzi basins for sustainable functions and services to people and nature	Output 2.1.1 - Shared diagnosis of ecosystems status, functioning and economic value established	GET	1,509,700	35,091,426
			Output 2.1.2 - Strengthened Environmental Flow management Framework for improved decision making			
			Output 2.1.3 - Project progress towards outcomes documented and shared with all stakeholders			
Component 3: Integrated basin planning for the Pungwe - Buzi – Save River Basins	Technical Assistance	Outcome 3.1 - Zimbabwe and Mozambique JWC agrees on updated shared water resources strategy and programme for joint ecosystem based management of the Pungwe- Buzi-Save river basins	Output 3.1.1 - Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) developed, building on existing Monographs, and Pungwe-Save-Buzi Strategic Action Program (SAP) developed, building on	GET	1,313,475	3,300,000

	the TDA and IWRM regional (SADC) / basin / national plans & adopted at ministerial level (JWC)		
	Output 3.1.2 - Institutional capacity for integrated planning strengthened		
	Output 3.1.3 - Funds raised for SAP implementation		
	Output 3.1.4 Project progress towards outcomes documented and shared with all stakeholders		
	Sub Total ($)	**5,666,125**	**41,776,426**
Project Management Cost (PMC)			
	GET	333,875	530,000
	Sub Total($)	**333,875**	**530,000**
	Total Project Cost($)	**6,000,000**	**42,306,426**

Please provide justification

The PMC is 5.8% of the proejct budget because of the regional nature of the project. Details are provided in the budget spreadhseet in annex.

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount($)
GEF Agency	IUCN BRIDGE P	In-kind	531,426
Donor Agency	CRIDF/DFID-UKAid	In-kind	2,770,000
Donor Agency	GRID-Arendal (Norway)	In-kind	200,000
Government	Zimbabwe	In-kind	530,000
Government	Zimbabwe	In-kind	200,000
Government	Zimbabwe	In-kind	2,900,000
Government	Zimbabwe	In-kind	2,000,000
Government	Zimbabwe	In-kind	33,175,000
		Total Co-Financing($)	**42,306,426**

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

Agency	Trust Fund	Country	Focal Area	Programming of Funds	NGI	Amount($)	Fee($)
IUCN	GET	Regional	International Waters		No	6,000,000	540,000
				Total Grant Resources($)		**6,000,000**	**540,000**

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? No

Includes reflow to GEF? No

F. Project Preparation Grant (PPG)

PPG Required ☐

PPG Amount ($)

150,000

PPG Agency Fee ($)

13,500

Agency	Trust Fund	Country	Focal Area	Programming of Funds	NGI	Amount($)	Fee($)
IUCN	GET	Mozambique	International Waters		No	75,000	6,750
IUCN	GET	Zimbabwe	International Waters		No	75,000	6,750
				Total Project Costs($)		**150,000**	**13,500**

Core Indicators

Indicator 7 Number of shared water ecosystems (fresh or marine) under new or improved cooperative management

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Shared water Ecosystem		Pungwe		
Count	0	1	0	0

Indicator 7.1 Level of Transboundary Diagonostic Analysis and Strategic Action Program (TDA/SAP) formulation and implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)
Pungwe		3		

Indicator 7.2 Level of Regional Legal Agreements and Regional management institution(s) (RMI) to support its implementation (scale of 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)

Indicator 7.3 Level of National/Local reforms and active participation of Inter-Ministeral Committees (IMC; scale 1 to 4; See Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)

Indicator 7.4 Level of engagement in IWLEARN throgh participation and delivery of key products(scale 1 to 4; see Guidance)

Shared Water Ecosystem	Rating (Expected at PIF)	Rating (Expected at CEO Endorsement)	Rating (Achieved at MTR)	Rating (Achieved at TE)

PART II: Project JUSTIFICATION

1. Project Description

1) The global environmental problems, root causes and barriers identified at PIF stage were confirmed during site visits and consultations at local and national level during the PPG stage. Beyond E-Flows and droughts & floods management, the stakeholders main concern is broader and relates to water sharing and allocation between the two countries. These sections have been further detailed in section 3.3 of the Project Document.

2) The baseline scenario remains consistent with the description in the PIF. Additional details on the baseline scenario and projects can be found in sections 3.6 and 4.6 of the Project Document.

3) The proposed alternative scenario and GEF focal area strategies remain globally consistent with those proposed at the PIF stage. However, the main co-financing identified at PIF stage (Pungwe Program PP2) has actually terminated and will not be continued as anticipated in the PIF. For this reason, the selection of co-financing has been revised and updated. In addition, the field visits and the stakeholders consultations allowed to refine and prioritize their needs and concerns. Expected outputs and activities have been modified/refined accordingly. The changes introduced reflect the additional information gathered through stakeholder consultations and site visits during the PPG stage, and have been valided during a Regional Workshop (Mutare, 11th July 2018).

Also, the overall framework of the project has been re-organized. Former Component 1 about strategic planning becomes new Component 3. Former Component 2 about Floods and Droughts Management becomes new Component 1. And former Component 3 about eflows and ecosystems conservation becomes new Component 2. The rationale of this reorganization is that data, tools and information generated through Component 1 and Component 2 activities will feed the preparation of the strategic planning documents (TDA/SAP) and the related implementation tools (ressource mobilization strategy, capacity building, etc). For instance, the detailed assessments of the current hydrological monitoring network, of the flood risk, and of the ecosystems will ease the identification and selection of the priority transboundary issues in the TDA, to be adressed by the SAP.

Finally, the budget volume dedicated to the preparation of the TDA/SAP and related activities was decreased, as this activity was not considered as a priority by the stakeholders, since monographs and action plans have already been drafted for each of the 3 basins. The budget difference was reallocated to Component 1 and Component 2 to improve their sustainability and strengthen the expected results and impacts.

The overall balance of the three components budget is slightly different from what was expected at PIF stage. This results from the findings and conclusions of the field investigations and stakeholders consultations led during the PPG mission. This change was introduced to better match with the stakeholders expectations and needs on the field. The strategy was validated by the stakeholders during a regional validation workshop.

It is also worth to note that the Project Management Costs are slightly higher compared to the provisions of the PIF. A transboundary project and the coordination between an international commission and 2 national institutions it requires justify the need for a Regional Coordinator full time. He will be supported by two IWRM experts who will lead the technical activities in the 2 countries. The budget for these two IWRM experts is provided in Component 1, Activity 1.0 to keep PMC cost as close as possible to the provisions of the PIF.

Please refer to sections 4.1, 4.2 and 4.3 of the Project Document for further details.

4) The incremental reasoning remains globally consistent with the one proposed in the PIF, having been refined based on additional information form the baseline and co-financing projects. See Section 4.8 of the Project Document.

5) The global environmental benefits of the project have been refined based on additional information gathered during the PPG stage. See Section 4.1 of the Project Document.

6) See sections 4.9 and 5 of the Project Document.

A.2. Child Project?

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

NA

A.3. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Stakeholder contribution to the design phase:
The project components design process, during the PPG mission, benefited from the contributions of various regional, national and local stakeholders. Regional, national and local stakeholders from the national institutions, the private sector and the civil society have indeed been invited to share data and information on the transboundary environmental issues they face. They were also invited to express their needs in terms of capacity building, institutional strengthening and on-the-ground intervention to tackle these issues. Local and national consultations (national meetings in both countries in April 2018, field missions in April 2018 and May 2018, in Mozambique and Zimbabwe respectively) and dedicated work sessions during the regional workshops held in Pretoria, South Africa, 13/02/2018, Beira, Mozambique (07/05/2018) and Mutare, Zimbabwe (12/07/2018) in the framework of the PPG mission were specifically organised to ease this information sharing. A broad range of stakeholders took part to these exercises. The minutes of the consultations are detailed in the project scoping report. The detailed contributions provided during the workshop sessions are available in the workshop reports

No indigenous groups will be affected by the project.

For additional details on identified stakeholders and their engagement, see sections 3.4 and 6 of the Project Document.

Documents

Title	Submitted

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

To assure stakeholders remain engaged and participate in project implementation, numerous aspects of stakeholder involvement are integrated into the key components of the project design. Technical partners will undertake activities under contractual arrangements. The project will co-ordinate with all the sector initiatives implemented by other agencies in the sub-region. IUCN has initiated discussions at national and regional levels with other development partners on developing an integrated approach to addressing floods, droughts, and water-related ecosystems management in the region. Successful implementation of the project will depend on the active participation of stakeholders. To assure this, stakeholder involvement is recognized as an integral requirement for each project component. In endorsing the project document, the countries of the region recognize and embrace the need for this direct involvement by all stakeholders in the project process.

The primary stakeholders in this project include:

- Public Sector: ministries responsible for water resources management, disaster risk reduction, environment, community development, and education;
- Local government authorities;
- Local community-based decision bodies

- Community-based organizations: groups, cooperatives, associations and Non-Governmental Organizations (NGO): national trusts, conservation associations, women's organizations, organizations of fisher-folk and national and regional organizations representing sedentary crop growers and livestock raisers, pastoralists, etc.
- Local communities: traditional rulers, farmers, fishermen, women, hunters, etc.
- Private Sector: manufacturers/agro industrials (irrigation schemes), hydroelectric dams operators;
- Professionals: researchers, sociologists, environmental managers, engineers (water, civil, environmental), biologists, teachers, curriculum specialists, media practitioners

The following stakeholder engagement strategy indicates how the various stakeholders will be involved, and at what stages. In order to attain sustainability, the activities are designed to address interests of large groups of stakeholders, and a significant portion of the budget is designated for this task.

Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

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

Executor or co-executor; Yes

Other (Please explain)

The engagement strategy of the project relies on a same 3-step workflow, that shall be implemented whenever stakeholders participation is expected:

Capacity building;

Technical support for an accurate diagnostic;

Consultation and dialogue involving all the stakeholders towards the elaboration and implementation of development strategies, management plans, adaptation measures, or resilience strengthening activities.

Specific roles of each stakeholder

Indicative roles of identified key partners are detailed in the following stakeholder table.

Country	Name of the organisation	Main activities in relation with the project	Role / involvement in project
		Provision of framework for transboundary wat	Benchmarking with other regional experiences and advi

SADC	SADC Water Division	er management Coordination of transboundary initiatives	ce Benefits from operationalisation of SADC Protocol for P ungwe, Buzi, Save basins
Basins	Joint Water Commission	Bilateral dialog and advice to the respective g overnments on the conservation, developmen t and utilisation of their shared water and wat ercourses	High-level orientation of the project Benefits from the operationalisation of JWC mandate a t local level, with strengthening of bilateral rivers dialog ue
State national and regional services			
Mozambique	National Water Council	Advice on cross-sectoral coordination	Support to JWC sessions preparation
	Ministry of Public Works, Housing a nd WR - DGNRH	National legal, policy and planning oversight o f the water sector	Intervention in line with national policies and strategies for water resources management Implement and benefit from all project activities. Many activities aim at ARA-Centro capacities strengthening, t hat will host technical assistance
	ARA-Centro	Operational water management for Pungwe, Buzi and Save basins (planning, administratio n and control of public waters (including sanc tions), licensing, approval and supervision of new hydraulic infrastructures, monitoring, wat er users dispute resolution, definition of prote ction areas)	
	National Institute of Disaster Manag ement (INGC)	Natural Disasters (flood, drought, cyclone) pre vention, coordination and day to day manage ment	Implements and benefits from all project activities reg arding flood management (Component 1)
	National Institute of Meteorology (I NAM)	Climate monitoring and meteorological forec ast	Implements and benefits from activities 1.1 (improvem ent of the Hydromet network) and activity 1.6 (informat ion dissemination in early warning systems)
	Ministry of Land, Environment and r ural development (MITADER) - ND o f Environment	National legal, policy and planning oversight o f the environment sector	Involved in activities aiming at environmental protectio n (Component 2 and 3)
	Agência nacional de Controlo de Qu alidade Ambiental	Water quality issues	Involved in activities regarding environmental enforcem ent strengthening (2.1)
	Instituto Nacional de Investigação P esqueira	Knowledge management of marine, estruarin e and riverine ecosystems, including mangrov es and wetlands	Shall be involved and benefit from activities of characte risation of ecosystems (2.1) and consideration of their needs in terms of water regime (2.3: e-flows). Shall be i nvolved in TDA/SAP process (3.1)
	Ministry of Environment, Water and Climate (MEWC)	National legal, policy and planning oversight o f the water sector National legal, policy and planning oversight o f the environment sector (including water qual ity and wetlands)	Intervention in line with national policies and strategies for water resources management

		Climate monitoring and meteorological forecast Climate change adaptation and mitigation coordination	Implement and benefit from all project activities.
Zimbabwe	Ministry of Local Government, Public Works & National Housing - Department of Civil Protection	Natural Disasters prevention, coordination and management	Implements and benefits from Component 1
	ZINWA (Save /Runde)	Operational water management for Pungwe, Buzi and Save basins (planning, administration and control of public waters (including sanctions), licensing, approval and supervision of new hydraulic infrastructures, monitoring, water users dispute resolution, definition of protection areas)	Intervention in line with national policies and strategies for water resources management Implement and benefit from all project activities. Many activities aim at ZINWA capacities strengthening. Will host technical assistance
	Environment Management Agency (EMA)	Wetlands and water quality issues	Involved in activities aiming at environmental protection (Component 2 and 3).
	Nyanga National Park	Natural resources and wildlife protection and valorization	Involved into Activity 2.1 (identification of key ecosystems and assessment of their needs in terms of water regime)
	Gonarezhou National Park		
Moz	Gaza, Inhambane, Sofala and Manica Provincial offices	Cross-cutting coordination at provincial level Environmental officers in charge of pollution control	Involved in national meetings, information dissemination and community awareness on early warning systems (1.4, 3.3, 3.6)
Zim	Masvingo, Manicaland, Mashonaland East, Matabeleland South and Midlands Provincial offices	Cross-cutting coordination at provincial level	
Moz	Massangena, Inhassoro, Govuro, Mabote, Machanga, Machaze District Councils	Cross-cutting coordination at district level	Involved in national meetings, information dissemination and community awareness on early warning systems (1.4, 3.3, 3.6)
Zim	Rural District Councils	Disaster risk management at district level	
Moz	Chimoio, Beira , Dongo Municipalities	Urban planning, climate change adaptation at city level, flood management & rescue	
Zim	Mutare, Gweru, Masvingo, Shurugwi, Zvishavane Municipalities	Urban planning	
Local decision and management bodies			
Moz	Basin Committees (Pungwe and Save)	Stakeholders participation	Involved in national meetings, and in particular for TDA/SAP Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3, 2.6)

Moz	Sub-basin Committees (Nhazonia, Gorongosa)	Stakeholders participation	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3)
Zim	Basin Committees (Save, Runde)	Coordination of sub-basin committees	Involved in national meetings, and in particular for TDA/SAP Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3)
Zim	12 sub-catchment councils	Stakeholders participation, water tariffs collection, legal control	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3, 2.6)
Moz	Comites Locais de Gestao e Risco de Calamidades	Communities organisation for flood management	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.6)
Moz	Comites de gestão de Recursos naturais (CRN)	Natural resources management in Gorongosa area	Concerned CRN consulted for assessing key ecosystems status (2.1) and e-flows (2.3)
NGOs			
Moz	Global Water Partnership	Benchmarking, exchange of experience, support to IWRM implementation	Executing Agency. Implements all activities
Moz	African Network of Basin Organisations / ANBO		Benchmarking and valorisation – involved in activity 3.6 and 3.7
Private sector			
Moz Zim	Farmers	Infrastructure construction. Water consumption and pollution as a result of agricultural activity	Involved in water uses assessment and water sharing procedures for e-flows/objective flows release (2.2, 2.6)
	Extractive mining companies	Water abstraction and pollution because of mining activities.	Interested in environmental enforcement strengthening (2.4)
	Gold panners	Fisheries (indigenous knowledge of fish ecology)	
	Fishermen	Operation of hydropower dams in Buzi basin	Consulted for assessing key ecosystems status (2.1) and e-flows (2.4)
Moz	Electricidade de Moçambique	Infrastructure construction. Water consumption and pollution as a result of agricultural activity	Involved in water uses assessment and water sharing procedures for e-flows/objective flows release (2.3)
Moz	Parque Nacional de Gorongosa (Carr Foundation)	Natural resources and wildlife protection and valorization	
	Parque Nacional de Zinave		

	Parque Nacional de Zinave		
Zim	Sustainable Agriculture Technology (Wildlife in Livelihood Development: WILD)		Involved into Activity 2.1 and 2.2
	Save Valley Conservancy Trust (SVCT)		
Research			
Zam	University of Zambezi	Water quality analysis	Solicited in activity 2.4 (roadmap for environmental issues)
Moz	University of Maputo	Research on mangroves	Involved in ecosystems status and needs assessment (2.1)
regional	Waternet	Researchers mobilization for e-flows determination Researchers networking regarding water	Involved in e-flows assessment (BRIDGE operator)
Donors			
International	GRID-Arendal	Flood risk mapping; technical diagnostic analysis	Co-financing Involved in the establishment of a funds mobilization roadmap (3.7)
international	GIZ, DFID-CRIDF, GEF, …	Projects funding	

Zoom on NGO and community relays capacities

In Mozambique

Name of the organization	Focal area	Size *(number of employees)*	Capacity / Functionality (+ to +++)
Comites locais de gestao de riscos (CLGRC)	Communities: - 28 comites in the Buzi, basin including Rio Lucite/Dombe & Revue, - 6 in the Pungwe basin - 19 (Govuro & Machanga) in the Save basin	18 voluntary members	+++ (Buzi) + (Save & Pungwe)
Comites de gestão de Recursos naturais(CRN)	6 Gorongosa	18 voluntary members	+++

In Zimbabwe

Name of the organization	Focal area	Capacity / Functionality (+ to +++)
Southern Alliance for Indigenous Resources (SAFIRE)	Sustainable utilisation of resources by rural communities	++
Bio-Innovate Zimbabwe (BIZ)	The collection of natural products by poor communities for commercial use	+++
Save Valley Conservancy Trust (SVCT)	Wildlife conservation and management	+++
Sustainable Agriculture Technology (Wildlife in Livelihood Development: WILD)	EU-funded community based wildlife management in communal areas adjoining Gonarezhou National Park	+++
Frankfurt Zoological Society (FZS)	Joint managers of Gonarezhou National Park with strong links to community wildlife management projects	+++

A.4. Gender Equality and Women's Empowerment

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

The project recognizes that women are under represented in positions of responsibility within civil society organizations and local institutions, including as concerns water resources management, and face significant barriers to securing resource rights. Women's groups and vulnerable populations have been involved systematically in discussions linked to the definition of the activities that are to be financed by the project and during the PPG field mission, efforts were made to meet with women.

The activities proposed have been defined in view of involving men and women equally. They include activites to raise awareness on water resource management issues and promote adaptation and mitigation actions.

Documents

Title	Submitted

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

Yes

If yes, please upload document or equivalent here

If possible, indicate in which results area(s) the project is expected to contribute to gender equality:

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

Improving women's participation and decision making

Generating socio-economic benefits or services or women Yes

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

Yes

The project logical framework includes gender dis-aggregated indicators, as well as the environmental and social management framework.

A.5. Risks

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being, achieved, and, if possible, the proposedmeasures that address these risks at the time of project implementation.

Table below provides risks analysis and the associated mitigation measures.

Risk Description	Level	Mitigation measure(s)
Political instability	Moderate	IUCN in consultation with the executing agency and the GEF Secretariat will suspend the project implementation.
Institutional turn over at national level	Moderate	IUCN and the Executing Agency ensure the participation of directors and managers from the relevant Directorates.
Institutional turn over at local level (MEP extension services, PMU experts, etc.)	Moderate	Strengthen the role of ZINWA and ARA-CENTRO. IUCN and the executing agency will jointly promote measures for a sustained project staffing over the project lifespan.
Climate change impacts at higher than anticipated levels	High	The region is likely to face more droughts and periods of heavy rainfall and the project is flexible enough to function under drier conditions. The project precisely aims at addressing climate risk to increase populations resilience to climate risks (both droughts and floods) and reinforce administrations capacity in risk assessment, monitoring, and mitigation. In this case, the project would even gain relevance. However, in the event of the occurrence of such climate event during the project implementation phase: - Should it occur at the beginning of the project, the actions would be postponed during recovery period, - Should it occur at the end of the project, the actions implemented would have contributed to protect project beneficiaries and improve their response to the event.
Security and stability in the region	Moderate	The PMU will be in close contact with the national administration offices and will have access to security upda

		tes. In addition, local stakeholders who are familiar with the local context and able to anticipate this risk will implement the project.
Weak capacity of institutions	Moderate	Institutional strengthening and capacity building will be intensified for the government staff through the provision of appropriate technical assistance, procurement, financial management and disbursement. The provision of continuous support and monitoring by the programme management team will provide rapid response support to emerging implementation challenges.
Low uptake of methods, techniques and tools for the management of water resources;	Low	Outputs of this project are; flood maps and strengthening of the community-early warning systems guidelines for the local managers and technicians, and training of communities on how to use them in the Buzi basin. They will be important compliments to the proposed interventions.
Lack of adequate financial commitment by target countries	Moderate	The two countries have, through the PPG process, expressed commitment to this project. However, given the development challenges facing them, there is a risk that other priorities deemed to be more urgent could emerge during the life of the project and threaten the sustainability of expected outputs and outcomes. IUCN will seek acceptable and manageable financial commitments from the member countries to this initiative. The involvement of other partners will also be sought to complement.
Project overwhelms the available capacity and skills to an extent it fails.	High	The Buzi experience of the community EWS proved that the approach proposed is appropriate provided the following steps are being followed: - Ensure a consistent analysis of local capacity, including the intrinsic capacity for innovation. - Propose strategies and plans for capacity building that are based on training needs identified through consultation and on estimated absorption capacity, and that are built on approaches respecting local cultures and w

		hile making room for the intrinsic capabilities innovatio n
Projects become source of con flict	Low	Project will be established through a consultative proc ess and all decisions are made with a bottom-up consu ltation as much as possible.

A.6. Institutional Arrangement and Coordination

Describe the Institutional arrangementfor project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Institutional arrangement

The execution of the project will be under the overall responsibility of the Joint Water Commission, gathering representatives of the Ministry of Public Work, Housing and Water Resources of Mozambique, and the Ministry of Environment, Water and Climate Change of Zimbabwe. JWC will be in charge of strategic orientation of the project.

The International Union for Conservation of Nature (IUCN) is the project's implementing agency for the project. IUCN will support JWC to ensure execution of administrative and financial matters and will assist in key technical and scientific issues. A Project Steering Committee (PSC) will be set-up as a regional task force to assist and advise on the implementation of the activities.

Global Water Partnership will serve as a bilateral executing agency contracted by IUCN and supported by partner government agencies to recrut and administer a Project Management Unit for the implementation of the project.

The Project Management Unit (PMU) and technical assistants funded by specific activities will be responsible for planning operational and day-to-day implementation of the project components.

Additional details on the institutional arrangements can be found in Section 5 of the Project Document.

The proposed project is consistent with GEF-6 focal area strategies for international waters (IW) and will be implemented in close coordination with multiple current and past GEF interventions related to this focal area strategy in SADC region. A ful list of these interventions is provided in Section 3.5.5 of the Project Document.

The PMC is estimated to 5.8% of the project cost. This is due to the regional element of the project, which involves increased coordination.

Coordination with other projects

After the Cyclone Idai disaster that affected most of the basin, a lot of development attention is now focusing on the landscape. Funding of close to USD100 million is coming from the World Bank, African Development Bank and other donors for the Idai Recovery Project (IRP) to Zimbabwe, with a higher amount for Mozambique, focusing on mitigating the impact of Cyclone Idai on the most affected communities, including restoring livelihood and infrastructure in areas most hit by the disaster in 2019. As this project will be implemented during the ZIRP activities, the synergistic approach will be used, coordinated by the national governments who host the IRP and are part of this project.

In Zimbabwe, the National Water Resources Masterplan Project will use its identified priority areas to consolidate the results from this project and demonstrate its impacts. Precisely, the building of capacity in basin agencies and strengthening of water cooperation, long standing areas in need of intervention, will use this project to achieve some identified targets. The Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway (SECA) Project,

which will be concluded in 2020, will also contribute its findings as lessons learnt for the implementation of component 1 activities on drought and flood resilience.

The Building River Dialogue and Governance Phase 4 (IUCN), which co-finance the implementation of some project activities. As an IUCN-implemented project, BRIDGE's component on enhancing capacity to value shared natural water infrastructure/assets will be implemented in tandem with Component 2 of this project. The BRIDGE component on strengthening legal and policy provisions for joint conservation will be coordinated to coincide with Component 3 in order to provide dialogue platforms for effective project implementation.

The SADC-GMI's Sustainable Groundwater Management in SADC Member States Project, which focused on institutional development, capacity strengthening and planning generated important results that can inform the conjunctive management activities in Component 3. SADC-GMI is envisaged to play a role in the project execution, where their expertise will also contribute to the design of the tri-basin institution and the development of the SAP. SADC-GMI will work with the GWP, the executing agency, in delivering their tasks.

The Transboundary Water Resources Management Programme for Africa (GRID-Arendal) which carried out assessments with the SARDC, leading to the publication of Atlases for Lake Victoria Basin, Zambezi River Basin and the Limpopo Basin, also earmarked to execute some tasks in this project. The SARDC will work with GWP under Activity 3.2 to produce a basin atlas for the PUBUSA. The objective here is to communicate the urgency required in addressing these changes in the SAP. Activity will be co-funded by GRID-Arandal and SARDC, and will produce a basin atlas, a story map and outreach activities to disseminate widely the findings of this initiative.

Additional Information not well elaborated at PIF Stage:

A.7. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels. How do these benefits translate in supporting the achievement of global environement benefits (GEF Trust Fund) or adaptaion benefits (LDCF/SCCF)?

- Strengthened resilience of the local communities to flood and drought, through improved floods and droughts management in the Pungwe, Save and Buzi basins and related risks mitigated;
- Flood and drought risk mainstreamed in the decision making process based on improved national and transboundary capacity for integrated management of floods and droughts
- Strengthened resilience of local communities' livelihoods to drought relying on sustainable functions and services delivered to people and nature by improved water ecosystems of the Pungwe, Save and Buzi basins;
- Zimbabwe and Mozambique JWC agrees on updated shared water resources strategy and programme for joint ecosystem based management of the Pungwe- Buzi-Save river basins.

See also section 4.2 of the Project Document and the flowcharts explicating the expected impacts and benefits of the proposed activities within this project.

A.8. Knowledge Management

Elaborate on the Knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings. conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document ina user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

Elaborate on the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives (e.g. participate in trainings, conferences, stakeholder exchanges, virtual networks, project twinning) and plans for the project to assess and document in a user-friendly form (e.g. lessons learned briefs, engaging websites, guidebooks based on experience) and share these experiences and expertise (e.g. participate in community of practices, organize seminars, trainings and conferences) with relevant stakeholders.

Knowledge management is an integral part of the project design and was adressed in every proposed activity (see section 4.10 of the Project Document) and more specifically in activities 3.9 and 3.10. As stated above, the project also builds heavily on previous initiatives and projects implemented in SADC region, as detailed in Section 3.5. Consequently, during the PPG mission, particular attention was paid to assessing the results and products of these projects. Initiatives, actions and activities that did not produce the desired results have been analysed to avoid repeating mistakes, and project managers of these past or on-going initiatives were extensively consulted during the scoping and the field missions of the PPG phase.

B. Description of the consistency of the project with:

B.1. Consistency with National Priorities

Describe the consistency of the project with nation strategies and plans or reports and assessements under relevant conventions such as NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

Project alignment with water resources management policies

Alignment with the SADC framework

Among the regional and international conventions to which both Zimbabwe and Mozambique are party, the SADC revised protocol on shared water resources is of particular significance. The Protocol has the following objectives:

a) *"Promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses;*

b) *Advance the sustainable, equitable and reasonable utilisation of the shared watercourses;* ***c)*** *promote a co-ordinated and integrated environmentally sound development and management of shared watercourses;*

d) *promote the harmonisation and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and*

e) *promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management."*

Although not directly dedicated to governance framework development, the GEF project will contribute to cooperation strengthening for the shared basins that may in time lead to the establishment of the tri-basin organisation. However, the 3 components are perfectly in line with objectives b) and c) of the Protocol, while capacity building and data exchange activities will concur to objective e) and *Article 3.4*.

With its Component 2, the GEF project also operationalizes Article 3.2 which is about maintaining a proper balance *"between resource development for a higher standard of living for their people and conservation and enhancement of the environment to promote sustainable development",* and Article 4.2. stipulating to; *"jointly, protect and preserve the ecosystems of a shared watercourses, prevent, reduce and control the pollution and environmental degradation of a shared watercourse that may cause significant harm to other Watercourse States or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse."*

Key issues to be addressed under this are also 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 have remained mostly unimplemented to date. IUCN/GEFs involvement as neutral third party will help contribute to the achievement of these commitments and compliance with international treaties.

Alignement with the Pungwe Agreement

The GEF project is a contribution to the operationalisation of the Pungwe Agreement signed by both parties, and in particular:

- Article 12 regarding measurements of water quantity and quality, that the GEF project will concretize with the installation of hydromet monitoring stations (Activity 1.1) and the water uses knowledge development (Activity 3.1).
- Article 13 about *"regular exchange of data and information"* to which Activity 1.2 will contribute,
- Article 14 about "*drought and floods management"*, focus of Components 1 and 2.
- Article 17 about "flow regimes" that underlines the need to "*ensure water of sufficient quantity with acceptable quality to sustain the watercourse and its associated ecosystems"* which is precisely the purpose of activities 2.3 to 2.5.

Alignment with the National Water Policies

The Mozambican national Water Policy defines the main policies as follows: "*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 National Water Policy further recognizes the particular pressure undergone by shared river basins (1.2.c), and emphasizes the need for water for environmental protection (1.2.d), to reduce vulnerability to floods and droughts (1.2.e), and to promote peace & regional integration through joint water management in shared basins (1.2.f). The GEF project is fully coherent with this framework, and almost all activities of the GEF project echo to specific dispositions of the policy. For instance, the Policy prescribes the use of IWRM approach, including the guarantee of environmental flows (4) that are operationalized by Activity 2.3. For droughts and floods management (5), it also plans to develop flood mapping (Activity 1.3) or the development of plans for restriction of use in shared basins (Activity 2.6). It also promotes the development of joint initiatives in shared basins.

Drought management and transboundary watercourses management are listed as the top priorities of the Zimbabwean National Water Policy (Minister's Foreword*)."The policy acknowledges the principles of IWRM (6.3). The Environment is considered a legitimate and important user of water (environmental protection is the 4th objective out of 8 - 6.2). « therefore sufficient quantity of water of adequate quality will be allocated to meet the requirements riverine and aquatic eco systems, wildlife, wetlands, bird life etc, based on sound professional assessment" although their allocations come after other uses'. Water allocation "shall include environmental flows, followed by regular monitoring by Catchment and Sub-Catchment Councils. Environmental requirements sufficient to sustain essential environmental functions will be determined scientifically, reserved and included in all water plans, permit applications and permit approvals"*. Pollution control is also listed among the Priority Policy directives and Policy Principles (6.10). Component 2 activities are perfectly coherent with these priorities. The Policy also promotes ecosystems and wetlands "measures that protect high-value ecosystems such as wetlands, together with the management and control of erosion and high risk flood areas (7.6.6), to which Components 1&2 will contribute.

Project alignment with risk management policies

The 1st principle of the 1999 risk management policy in Mozambique emphasizes the role of communities in planning programming and implementing disaster management activities, which is the aim of activity 1.4. It also recommends (IVc) the preparation of sector plans for each kind of disaster, including droughts and floods, which corresponds to activities 1.3 and 1.4 of the GEF project. The governance setup created, namely the INGC, will be a key partner in the national project steering instances.

Project alignment with climate change strategies

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. The two first priorities (among 8 concerns) are: i) Adaptation and climate risk management; ii) Water resources, which gives important emphasis to GEF Project's Component 1. In particular, as established in the National Climate Change Adaptation and Mitigation Strategy (NCCAMS) (MICOA, 2012), the national priority is defined in its mission as follows : *"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 is also in line with the Zimbabwe INDC, 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 1.5°C. The global climate target is to prevent dangerous anthropogenic interference with the climate system 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.

Project alignment with environmental policies

Alignment with Ramsar Convention commitments

The two countries are signatories to the Ramsar Convention. This intergovernmental treaty 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 was adopted in Zimbabwe on 3 May 2013. Zimbabwe currently has seven 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 two 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 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 the ecosystem-based management, the project will promote principles of the Ramsar convention.

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 and considers 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.

Project alignment with development policies

Alignment with Sustainable Development Goals

The project will contribute towards attainment of the sustainable development goals by the two partner states. For 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 restoring 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 RISDP

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 cross-sectoral 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

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.

C. Describe The Budgeted M & E Plan:

Monitoring and evaluation (M&E) of the proposed project will be conducted in accordance with established IUCN and GEF procedures/guidelines. The standard M&E reports and procedures required for all IUCN/GEF projects will apply to the M&E plan for the proposed project, including the following:

Inception Workshop and Report. The Inception Workshop gathering the stakeholders involved in the project, and resulting Inception Report are the venue and means to finalize preparations for the implementation of the proposed project, involving the formulation of the first annual work plan, detailing of stakeholder roles and responsibilities, and of reporting and monitoring requirements. As the Project Document was developed based on a consultative process that integrated both scoping and field missions as well as stakeholder workshops, it is anticipated that the inception workshop and the resulting report would result in only minor adjustments to the provisions in the original Project Document.

Strategic Result Framework. Monitoring and evaluation begins with preparation of the Project Document, including a logical framework matrix based on indicators of implementation progress and means of verification. This Log Frame will underpin a results-based M&E system for the proposed project.

Quarterly Progress Report. Each quarter, the PMU will prepare a summary of the project's substantive and technical progress towards achieving its objectives. The summaries will be submitted to GWP, and will reviewed and cleared by IUCN before being sent to the IUCN/GEF Coordinator.

The Annual Project Report (APR) / project implementation review is designed to integrate the independent views of the main stakeholders of a project on its relevance, performance and the likelihood of its success. The APR covers performance assessments on project outputs and outcomes, major achievements, evidence of success, constraints, lessons learned and recommendations as well as an overall rating of the project. The APR will be prepared by the Project Coordinator after consultation with the relevant stakeholders, and will be submitted to the GWP. The stakeholder review will be framed by the logical framework matrix and the performance indicators. A Terminal Project Report will be prepared for the terminal meeting.

Tripartite Review (TPR) (Steering committee). The Tri-Partite Review (TPR) is a policy-level meeting of the parties directly involved in the implementation of a project. The same parties involved in the prior Inception Workshop will participate in the TPR (i.e., the members of the Steering Committee, including the regional and national executing agencies, IUCN, local partners, direct beneficiaries and other stakeholders). It will assess the progress of the project and make decisions on recommendations to improve the design and implementation of the project in order to achieve the expected results. On these occasions, the Project Coordinator will submit an updated work plan (if required) and the latest Annual Project Report (APR), and formulate recommendations for eventual adjustments of strategies and activities. A draft APR shall be prepared at least two months in advance of the TPR to allow for review by IUCN prior to the meeting. The Executing Agency will make sure that the recommendations of the TPR are carried out. Annual TPRs are not required as the Steering Committee meetings are expected to address many of the issues that would normally be addressed in a TPR.

Independent External Evaluation at mid-term and termination of the project. A mid-term project evaluation will be conducted during the third implementation year, focusing on relevance; performance (effectiveness, efficiency and timeliness); issues requiring decisions and actions; and initial lessons learned about project design, implementation and management. A final evaluation, which occurs three months prior to the final TPR meeting, focuses on the same issues as the mid-term evaluation but also covers impact, sustainability, and follow-through recommendations, including the contribution to capacity development and the achievement of global environmental goals.

Budget Revisions. Project budget revisions will reflect the final expenditures for the preceding year, to enable the preparation of a realistic plan for the provision of inputs for the current year. Other budget revisions may be undertaken as necessary during the course of the project. It is expected that significant revisions will be cleared with the IUCN/GEF Coordinator for consistency with the GEF principle of incrementality and GEF eligibility criteria before being approved;

Corresponding budget. The corresponding budget for the M&E plan is USD 173,550. The detailed budget of the M&E plan is provided within the detailed budget of the overall GEF project (Appendix 7).

The overall monitoring and evaluation plan is summarized in Table 11 below.

Table 11: M&E activities, timeframe and responsibilities

M&E activity	Frequency	Responsible	Budget (GEF funded)
Project Planning Documents: PRODOC, Logframe (including indicators), M&E Plan	During project design stage	Project proponent together with RPMU Staff and consultants and other stakeholders	PPG grant
Quarterly Progress Report	Quarterly	Project coordinator and project team	Activities 1.7, 2.8 & 3.8
Annual Project Progress Report	Annually	Project coordinator and project team in consultation with project stakeholders	
Tripartite Review / Project Implementation Review (PIR)	At 18 months	Regional Executing Agency, The Governments (National Executing Agencies), Regional Project Coordinator, project team.	PMC
Independent External Evaluation	At the mid-point and end of project implementation	Executing Agency (GWP)	Activity 4.5
Budget revisions	When necessary	Project team, IUCN headquarters	PMC

In addition to the standard IUCN and GEF procedures outlined above, the project will benefit from annual Steering Committee Meetings. The Steering Committee is the primary policy-making body for the present Mano River project. The Regional Project Coordinator will schedule and report on Steering Committee Meetings.

PART III: Certification by GEF partner agency(ies)

A. GEF Agency(ies) certification

GEF Agency Coordinator	Date	Project Contact Person	Telephone	Email
Sheila Aggarwal-Khan	11/23/2018	Taritor Davison		Davison.Saruchera@iucn.org

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

See ProDoc section 2

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

STAP review at PIF stage (*May 11th, 2017*)	
Secretariat comment	*Agency response*
1. To complement the thorough description of the biophysical factors being threatened by environmental degradation and climate change, STAP recommends describing the socio-economic context of the affected populations living along the Beira Corridor. This information is important in order to understand the population's abilities to cope with climate change, adopt, or adapt, practices that are drought and flood resilient.	Information on the socio-economic context of populations in the basin has been collected, with a particular focus on the pilot sites to be identified, and gathered in the dedicated sections “Socio-economic context” and “Threats, roots causes and barriers analysis” of the Project Document. The Beira city services have developed a Climate Change Adaptation Plan, considered as a reference planning document in the region. In addition, activity 2.1 will consist in further assessing the ecosystems services and the livelihoods of the local populations.
2. STAP suggests detailing the impact of climate variability on the water, energy, food nexus, which the project aims to use as a framework for improving ecosystem based management across the three river basins. This includes highlighting the role of climate change as a driver in the nexus, and identifying actions based on the linkages between climate variability, and resource management. In this respect, STAP also suggests providing details of climate change projections in the target area, or in the region. IUCN may want to refer to the following paper on the connections between climate and the water, energy, food nexus in southern Africa: Conway, D. et al. (2015)."Climate and southern Africa's water-energy-food nexus". The authors of this paper argue convincingly that in southern Africa the physical and socioeconomic exposure to climate impact is especially significant	The impacts of climate change and variability have been synthetized in the context section of the Project Document, including the recommended paper and references. In that respect, activities 1.1 and 1.2 will be dedicated to the strengthening of hydro-meteorological monitoring networks in the 3 basins and to the processing of generated baseline data for display in a real-time information system. These timeseries and information systems will characterize the impact of climate variability on the water resources and their uses in the 3 basins.

and is crucial in local economies and livelihoods.	
3. An aspect of the project that will need to be addressed more fully as the project is developed is the role of indigenous (local) technical knowledge. This is more specific than the stakeholder and community involvement mentioned in the proposal. The Institute for Poverty, Land and Agrarian Studies in South Africa estimates, for example, that indigenous farmer-saved seeds which farmers have been improving and adapting to local conditions over many years, currently constitute about 70% of seeds used in Mozambique. Top-down modernisation of agricultural development rarely includes the livelihood (and often climate resilience) of local practices; yet attention to local knowledge encourages farmer participation and support to conservation of ecosystems. This will be especially critical in the project achieving its ambitious target of 120 million hectares in sustainable land management in production systems (agriculture, rangelands, and forest). Advice especially on the importance in southern Africa rangelands of addressing local economies in transiting from land degradation to sustainable land management has been published and could give a useful guide to developing project components: Reed, M.S. et al (2015) Reorienting land degradation towards sustainable land management: Linking sustainable livelihoods with ecosystem services in rangeland systems. Journal of Environmental Management 151:472-485.	Indigenous knowledge has been fully integrated into the proposed approach, especially regarding flood management. The development strategy of the community-based early warning systems is based on indigenous knowledge developed by vulnerable communities and on scientific tools implemented by national administrations.
4. It is unclear what contributions the project will make towards addressing water pollution in the Beira Corridor. Conflicts between local farmers and artisanal miners have already occurred in Manicaland and along the borders between Mozambique and Zimbabwe. STAP recommends that the project contribute towards a baseline measuring the contaminants in the rivers, doing so will improve ecosystem functioning in the three river basins, and therefore, the project's effectiveness in addressing the wate	The water quality concerns emerged as priority from the discussions held during the PPG mission. In addition the PP2 program has carried out water quality monitoring campaigns. The project, through activity 2.7, will support water quality monitoring to enable the local administration relying on an operational plan to tackle this priority concern in the targeted basins

project's effectiveness in addressing the wate r, food, energy nexus.	
5. STAP recommends that the project detail ho w the project will contribute towards addressi ng the knowledge gap on the impact of climat e change on drought, or water availability. One possibility is for component 2 to focus on acq uiring baseline data on hydrological responses to climate. Learning generated in this regard s hould be included under knowledge managem ent. The following paper highlights knowledge gaps and research needs on understanding fur ther the impacts of climate change on water re sources in Mozambique and Zimbabwe: Kusa ngaya, S. et al. (2014). "Impacts of climate cha nge on water resources in southern Africa: a re view". Physics and Chemistry of the Earth 67-6 9 (2014) 47-54.	Activities 1.1 and 1.2 will be dedicated to the strengt hening of hydro-meteorological monitoring networks in the 3 basins and to the processing of generated ba seline data for display in a real-time information syst em. These timeseries and information systems will c haracterize the impact of climate variability on the w ater resources and their uses in the 3 basins.

GEF Secretariat Review at PIF stage *(23th August 2016)*	
Secretariat comment	*Agency response*
At endorsement stage/during project design: p lease expand on alignment with relevant natio nal strategies in key sectors in more detail.	The dedicated section "Consistency with national pri orities and plans" has been further detailed and upda ted.
Baseline: please expand the consideration of 'baseline' to not only address regional but also relevant national activities	The achievements and existing tools and capacities developed by local, national and regional projects or i nitiatives have been extensively detailed. A specific a ttention has been paid to build not only the project st rategy but also each activity on a robust and accurat e baseline. For instance, we recommend to capitalize on the approach and results of projects and strategie s implemented in other transboundary basins shared by the 2 countries (Limpopo, Zambezi).
During project design and implementation: ple ase add private sector under 'stakeholder grou ps' addressed. Currently they are not in the tab le on stakeholders though the PIF is clear that engagement will be key in maintaining environ mental flows (quantity) and water quality.	The private sector, particularly for the agricultural act ivities (important sugar estates in the basins among other irrigation users), the mining activities and the h ydropower production, have been consulted during th e PPG mission and will be part of the stakeholder en gagement plan during the implementation phase.
Urbanization and possible threats and opportu nities for maintaining sufficient water quality a nd quantity of both surface and groundwater s hould also be better described in the final proj ect document and then addressed in the TDA	Urbanization specifically (particularly around the city of Beira which is expanding on the mangroves) and t hreats, root causes and barriers have been further de scribed based on the information collected during th e country consultations and the field visits. During th

and SAP (during project implementation; as relevant).	e PPG process, the stakeholder have identified the priority issues related to IWRM in the three basins. This output, as well as existing monographs and action plans, will be a basis for the further TDA/SAP
Expand on and provide detail on the 'flood early warning system for community risks and collaboration with disaster risk management agencies' (in 2.2) and/or consider to possibly move to/combine with 2.5. Right now the community warning aspect seems to be only marginally addressed among all the other activities in 2.2.	A set of 2 full activities of the project will be dedicated to Community-based Early Warning Systems in vulnerable communities in the 3 basins: activities 1.4 and 1.6. This activity capitalizes the achievements of the past and on-going initiatives. The baseline related to Community-based EWS is indeed very strong. Mozambique has for instance developed an advanced Community Early Warning Systems (SIDAPs) in the Buzi basin, that has inspired the law for Natural Disaster Management, and which has been replicated in many other basins in Mozambique. The transboundary dimension with Zimbabwe needs however to be developed. In Zimbabwe, community flood management relies on community-based disaster risk management (CBDRM) trainings at ward level to ward disaster risk management committee.
3.2.3 activity[1] is very much appreciated. During project design please try to estimate the degree to which coastal mangroves provide coastal protection and fish spawning and shrimp habitat benefits. The project itself (during implementation) may want to assess this in more detailed economic terms to provide incentives to avoid further degradation.	Activity 2.1 will consist in ecosystem characterization and ecosystem services assessment. The expected result is to generate the necessary background environmental, social and economic information to pave the way to e-flows definition, to be undertaken under activity 2.3.
During project implementation, please consider partnering with ANBO (African Network of Basin Organizations) on learning mechanisms and knowledge exchange	A specific activity (3.6) is dedicated to learning mechanisms and knowledge exchange. In this frame, partnering with ANBO will be considered.
GEF Council Comments at PIF stage	
Suggestions for improvements to be made during the drafting of the final project proposal: Strengthening the transboundary cooperation as well as the management of water resources and associated ecosystems for improved water security, climate change resilience and sustainable livelihoods are sound and proven-to-work approaches. However, a higher prioritization of small-scale fisheries in the project design is seen as crucial for the project's success. Inland	While fisheries are an important ecosystem service, and will be a relevant measure of the consistency of ecological flows, the scope of this project does not extend to actual uses of the water resources, otherwise it will deviate from the PIF. The project cannot address all regional and national needs and some of these will be addressed only in the TDA and SAP actions which will be prioritized by the countries and can

fisheries are typically small-scale and subsiste nce in nature. This makes it difficult and costly to track their yields using conventional landing -based methods. FAO assumes that statistics underestimate inland fisheries catches by at le ast 50 percent (FAO SOFIA 2016 – p.114). Und erestimating inland yields, their importance for local livelihood and food security as well as th e ecosystem services that the river basins pro vide, often translate into water management pl ans that ignore the needs of these fisheries. W hereas this sector can serve as a natural ally in promoting the Environmental Flow Manageme nt Framework, without interventions it might h appen that resource-overutilization and destru ctive fishing methods negatively overcompens ate the project intended improvement of susta inable livelihoods.	only be addressed in a set of next investments for S AP implementation
The project documents should incorporate the promotion of sustainable fisheries in their com ponent 3 design (transboundary environmenta l flow policy and regulatory framework […] stre ngthened). These interventions should be fully in line and actively assisting the implementati on of the FAO Code of Conduct for Responsibl e Fisheries (CCRF) as well as the FAO-Voluntar y Guidelines on Small Scale Fisheries (VGSS F).	Please refer to response above
The project should actively seek for more syne rgies gained from exchanging lessons learned as well as aligning activities with other interna tional projects in the region, like the SADC fish eries programme (2015-2020) active in the ma nagement of shared [inland] fisheries resource s at the Zambezi River Basin.	The project will closely collaborate with key projects currently being implemented in the region. Examples are the IUCB BRIDGE Project, the SADC GMI groundw ater assemment programme and the USAID-Resilient Waters' institutional support to RBOs, executed by G WP. The modalities of these colaborationscan only b e finalised during the project inception.
In order to ensure synergies and complementa rity, Germany kindly requests to coordinate wit h two related projects implemented by GIZ on behalf of the German Federal Ministry for Econ omic Cooperation and Development (BMZ): o The bilateral project "Adapting to climate ch ange in Mozambique" also works with the Nati onal Directorate for Water Affairs and the ARA-	The ongoing and recent past projects are well noted and form part of the baseline in the prodoc (section 3.6), including the two mentioned projects. The Com munity based flood early-warning (2016-2019) captur ed here as 'Adapting to Climate Change in Mozambiq ue'project, was concluded in 2019 and produced an e arly warning system whose lessons learnt, and hard ware, will be incorporated in this project. The regiona l "Transboundary water management in SADC" was

Centro. It supports the development of national framework conditions and actions within the catchment of the Buzi River to adapt to the impacts of climate change on water resources. It uses i.a. approaches and experiences based on GTZ projects on Disaster Risk and Flood management that date back to 2005, which are mentioned in the IUCN/GEF proposal (PIF doc, p. 12). o The regional "Transboundary water management in SADC", co-financed by the UK Department for International Development (DFID). It supports the implementation of selected harmonised policies and strategies for transboundary cooperation in the water sector in the SADC region and will run until 2019.	"Transboundary water management in SADC", was also concluded in 2019, and some important lessons learnt from this project will inform implemteation. The same executing agency that worked on the project (GWP) will be executing this project and they were selectled partly because of this experience.

[1] About e-flows in the mangroves area

ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS.

A. Provide detailed funding amount of the PPG activities financing status in the table below:

PPG Grant Approved at PIF:			
Project Preparation Activities Implemented	*GETF/LDCF/SCCF/CBIT Amount ($)USD*		
	Budgeted Amount	*Amount Spent To date*	*Amount Committed*
Inception Workshop		682.24	
Site selection Zimbabwe		5,397.42	
Site selection Mozambique		739.00	
7th May, Mozambique		7,760.95	
Field mission Zimbabwe		7,659.08	
11th July Zimbabwe		9,169.20	
Grant Management fees		6,749.37	
Consultant payment		113,000.00	
Total	150,000	151,157.26	0

ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/CBIT Trust Funds or to your Agency (and/or revolving fund that will be set up)

ANNEX E: GEF 7 Core Indicator Worksheet

Use this Worksheet to compute those indicator values as required in Part I, Table G to the extent applicable to your proposed project. Progress in programming against these targets for the program will be aggregated and reported at any time during the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

ANNEX: Project Taxonomy Worksheet

Use this Worksheet to list down the taxonomic information required under Part1 by ticking the most relevant keywords/topics//themes that best describes the project

International Union for Conservation of Nature

Countries:

Mozambique - Zimbabwe

PROJECT DOCUMENT (PRODOC)

PREPARATION OF THE GEF-FUNDED PROJECT:
"MANAGEMENT OF COMPETING WATER USES AND ASSOCIATED ECOSYSTEMS IN PUNGWE, BUZI AND SAVE BASINS"

Brief description of the project

The proposed GEF-funded "Management of competing water uses and associated ecosystems in Pungwe, Buzi and Save basins" will be implemented by the International Union for Conservation of Nature (IUCN). It targets the conservation and sustainable use of the transboundary water basins resources, including their risk mitigation components within 3 river basins shared bilaterally by Mozambique and Zimbabwe: Pungwe, Buzi and Save river basins.

These 3 basins are located along the Beira corridor, an important economic corridor that links Beira harbour to the hinterland, with associated impacts on the environment (pollution from mining activities, intensive agriculture, deforestation …). Populations also suffer high vulnerability to climate hazard (floods, droughts, cyclones) that is likely to increase with climate change aggravation. The strong development of upstream water uses is now raising the issue of water allocation and its dimension of environmental flows that has particular importance in a transboundary context. These resources are of highest importance for the communities that derive their livelihood from their ecosystem services, in a context of endemic poverty and low resilience.

The project seeks to promote holistic approaches to the water-food-energy nexus, with specific interest on connected ecosystems. It a double focus of developing capacities for managing water resources and to design participatory and community–based strategies.

The project will be implemented in the 3 transboundary basins, with the objective of strengthening the management of transboundary water resources and connected ecosystems for sustained ecological benefits and improved resilience for the riverine communities.

The proposed project contributes to GEF 6 Strategic Objective 1 - Conserve, sustainably use, and manage biodiversity, ecosystems and natural resources globally, taking into account the anticipated impacts of climate change – and is consistent with focal area strategy for international waters (IW) as it will contribute to the conservation of the 3 basins aquatic ecosystems and wetlands through the sustainable management of transboundary water basins.

The need for developing transboundary cooperation for water resources management has been materializing for years through several initiatives, including the signature of a transboundary Pungwe agreement (Buzi's and Save's are under preparation), and the wish to establish a bilateral tri-basin river

basin organisation. In each component, the project will contribute to support transboundary cooperation for water resources management, either with the development of joint initiatives (joint hydrological monitoring campaigns), common tools development (TDA/SAP, roadmap to reduce mining pollution), bilateral capacity building or through experience sharing (on community-based early warning systems for instance). Component 1 will contribute to strengthening water-related risk management through the reinforcement of monitoring systems, the development of real-time operational tools, and the empowerment of communities in their flood mitigation autonomy. Component 2 will focus on enhancing ecosystems services though quantitative water management, including operationalisation of environmental flows (assessment and legal framework establishment), and through water quality improvement. In Component 3, National inter-ministry committees and technical advisory teams would contribute to the development of a regional Transboundary Diagnostic Analysis and subsequently to the preparation of a preliminary Strategic Action Plan.

Benefits of collaboration on transboundary basin and adoption by cooperating states in a Transboundary Water Resource Management approach will contribute to strengthen community livelihoods resilience to flood and drought, mitigate these risks, improve water allocation, and address environmental issues. Results and impacts will include increased transboundary water cooperation including a coordinated approach for flood and drought risks management and mainstreaming of these risks in the decision making process, strengthened capacities for water management linking appropriate scales of intervention, increased communities autonomy and ownership in water-related risk management, reduced vulnerability of the local communities to flood and drought.

List of Acronyms

AfDB:	African Development Bank
ANBO:	African Network of Basin Organizations
BMZ:	German Federal Ministry for Economic Cooperation and Development
BRIDGE:	Building River Dialogue and Governance
BRLi:	Consultant Company BRLi
CRDIF:	Climate Resilient Infrastructure Development Facility
CSO:	Civil Society Organization;
DFID:	UK governmental Department for International Development;
DRM:	Disaster Risk Management
ESMS:	Environmental & Social Management System.
EU:	European Union
GCF:	Green Climate Fund
GEF:	Global Environmental Fund
GIZ:	Deutsche Gesellschaft für Internationale Zusammenarbeit
HYCOS:	Hydrological Cycle Observation System
IPCC:	International Panel of Experts on Climate Change
IUCN:	International Union for Conservation of Nature
IWRM:	International Water Resources Management;
JWC:	Joint Water Comission
KfW:	German government-owned development bank
PIF:	Project Identification Form
PP:	Pungwe Programme
PPG:	Project Preparation Grant
PP2:	Pungwe Project 2
PRODOC:	Project Document
PuBuSa:	Pungwe-Buzi-Save
SIDA:	Swedish International Development Cooperation Agency
STAP:	GEF Scientific and Technical Advisory Panel
UNEP:	United Nations Environment Program
USAID:	United States Agency for International Development
WRM:	Water Resources Management

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1 Project Profile

1.1	**Project title**	Management of competing water uses and associated ecosystems in Pungwe, Buzi and Save Basins
1.2	**Project Number (GEF ID / IUCN ID)**	GEF ID: 9593 ; IUCN ID: P02269
1.3	**Project type (FSP or MSP)**	Full-sized Project (FSP)
1.4	**Trust Fund**	GEF Trust Fund
1.5	**GEF strategic objectives and focal areas**	**GEF Strategic Objective 1** – Conserve, sustainably use, and manage biodiversity, ecosystems and natural resources globally, taking into account the anticipated impacts of climate change. **Focal Areas** International Waters.
1.6	**IUCN programme priority**	(1) valuing and conserving nature and (2) effective and equitable governance of nature's use
1.7	**Geographical scope**	Regional/Multi-country: Mozambique, Zimbabwe
1.8	**Project executing agencies**	**Implementing Agency:** International Union for Conservation of Nature (IUCN) **Executing Agency at regional level:** Global Water Partnership **Executing Agencies at national level:** ***Mozambique***: Ministry of Public Work, Housing and Water Resources and its agencies (ARA-Centro); ***Zimbabwe***: Ministry of Environment, Water and Climate Change and its agencies (ZIN-WA);
1.9	**Duration of project (including expected start and end dates)**	48 months; Commencement: September 2019; Completion: August 2023.
1.10	**Project cost (Summary)**	

Item	**USD**
A. GEF financing	6,000,000
B. Co-financing	
- IUCN (BRIDGE P4)	531,426
- CRIDF/DFID-UKaid	2,770,000
- GRID-Arendal (Norway) - Save and Runde Plans Zim - NWRD Project (World Bank) Zim - Water Fund Zim	200,000 200,000 2 900,000 2 000,000
- SECA Zim Zimbabwe (in-kind) Mozambique (in-kind)	33,175,000 530,000 416,800
C. Sub-total co-financing	42,723,226

D. Total (A+C)	48,723,226

2 Project Results Framework

Table 1: Project Results Framework

Objective / outcome / Output	Indicators	Baseline	End of project targets	Sources of verification	Assumptions/risks
Project objective: 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)					
Outcome 1.1 – Floods and droughts management in the Pungwe, Save and Buzi basins is improved and related risks mitigated	- Number of administrations with real-time capacity of monitoring floods & droughts - percentage of riverine communities in flood-risk areas covered by Early-Warning Systems involving both communities and administrations	1 10%	+6 90%	Annual project monitoring report Mid-term and final evaluations Record of decisions taken by government on flood/drought mitigation Annual reports of ARA-Centro, INGC, ZINWA	
Output 1.1.1 – Improved water resources monitoring, warning and information system in support of flood and drought risk management	- Number of hydrometric stations with telemetric transmission operational in the basin - Number of meteorological stations with telemetric transmission operational in the basin - frequency of data exchange (water quality, ecological data, meteorological data, hydrological data, hydro morphological data)	0 0 1 / month	8 8 3 / month	Annual project monitoring report Physical verification on site Users manuals Mid-term and final evaluations	
Output 1.1.2 – Flood risk & vulnerability characterised	- Area covered with flood hazard maps - Number of printed flood hazard maps distributed at local level (district, …) - Number of districts using the flood maps to deploy specific flood management strategies	0km^2 0 0	+150km^2 200 +6	Annual project monitoring report Mid-term and final evaluations Maps edited Users manuals	

Objective / outcome / Output	Indicators	Baseline	End of project targets	Sources of verification	Assumptions/risks
Output 1.1.3 – Drought risk & vulnerability assessed	- Drought risk modelled - Number of districts using drought-risk maps for planning	0 0	+2 +6	Annual project monitoring report Mid-term and final evaluations	Assumption: Continued commitment of all stake-holders to collaborate
Outcome 1.2 – Improved national and transboundary capacity for integrated management of floods and droughts	- Number of administrations using transboundary procedures (including data exchange) for real-time flood and droughts management	0	6	Annual project monitoring report Mid-term and final evaluations	
Output 1.2.1 – JWC, member States and communities' capacities for flood and drought management strengthened	- Number of male/female staff trained - Number of operational SMS warnings - Number of Local disaster management committees trained and equipped	3/6 0 0	50/75 +5/ week in a flooding season 12	Training sessions records SMS count	
Output 1.2.2 – Project progress towards outcomes documented and shared with all stakeholders	- Number of project steering committee meeting held - Number of M&E missions completed a year - Number of review meetings	0 0 0	12 2 2	Annual project monitoring report Mid-term and final evaluations	
Outcome 2.1 – Improved water ecosystems of the Pungwe, Save and Buzi basins for sustainable functions and services to people and nature	- Number of aquatic ecosystems & wetlands which conservation is considered a political priority	0	6	Government gazzette	
Output 2.1.1 – Shared diagnosis of ecosystems status, functioning and economic value established	- Number of diagnosis carried - Number of groundwater hotspots identified	0	+1	Endorsed shared diagnosis	

Objective / outcome / Output	Indicators	Baseline	End of project targets	Sources of verification	Assumptions/risks
Output 2.1.2 – Strengthened Environmental Flow management Framework for improved decision making	- Number of environmental flows methodological guidance written - number of e-flows determinated and implemented in pilot sites - number of legal texts precising e-flows framework written - Number of data and information sharing protocols written and tested - number of staff trained for e-flows determination (male/female)	0 2 1 2 15/5	2 6 3 +3 25/20	Validated guidance document Endorsed legal texts Annual project monitoring report Mid-term and final evaluations Nationally adopted data sharing protocols	
Output 2.1.3 - Project progress towards outcomes documented and shared with all stakeholders	- Number of project steering committee meetings held - Number of M&E missions completed - Number of review meetings	0 0 0	12 2 2	Annual project monitoring report Mid-term and final evaluations	
Outcome 3.1 - Zimbabwe and Mozambique JWC agrees on updated shared water resources strategy and programme for joint ecosystem based management of the Pungwe- Buzi-Save river basins	- Number of basins covered with updated strategic documents	0	+3	Annual project monitoring report Mid-term and final evaluations Annual reports of ARA-Centro, and ZINWA Minutes of JWC meetings	
Output 3.1.1 - Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) developed, building on existing Monographs, and Pungwe-Save-Buzi Strategic Action Program (SAP) developed, building on the TDA and	- Number of water balance reviewed - An TDA developed, and validated by the Joint Water Commission	0 1 1	+3 +1 +1	Endorsed TDA Annual project monitoring report	

Objective / outcome / Output	Indicators	Baseline	End of project targets	Sources of verification	Assumptions/risks
IWRM regional (SADC) / basin / national plans & adopted at ministerial level (JWC)	- A SAP is developed and endorsed by at least one minister in each country			Mid-term and final evaluations Endorsed SAP Annual project monitoring report Mid-term and final evaluations	
Output 3.1.2 – Institutional capacity for integrated planning strengthened	- Presence of a groundwater team in the JWC (male/female) - Number of transboundary learning opportunities materialized - Number of international conference with contribution from the project IW Learn Participation	1/1 1 0 0	2/2 2 8 3	Training sessions records Minutes of meetings Communications to international conferences IW Learn Website	
Output 3.1.3 – Funds raised for SAP implementation	- Number of resource mobilization strategies developed - Number of international donors conference held	1 0	3 1	Minutes of the international donors conference Minutes of the JWC meetings Donors commitments	
Output 3.1.4 - Project progress towards outcomes documented and shared with all stakeholders	- Number of project steering committee meetings held - Number of M&E missions completed - Number of review meetings	0 0 0	12 2 2	Annual project monitoring report Mid-term and final evaluations	
Outcome 4.1 - Project is effectively and efficiently managed		0	1	Annual project monitoring report Mid-term and final evaluations	

Objective / outcome / Output	Indicators	Baseline	End of project targets	Sources of verification	Assumptions/risks
Output 4.1.1 - Project management team established and functional	- number of regional project coordinators hired - number of administrative and finance officer hired - number of bilingual administrative assistant hired - number of drivers hired - number of fully equipped offices	0 0 0 0 1 0 0	1 1 1 2 2 0 1	Signed contracts Invoices Asset register	
Output 2.3.2 - Project evaluation and audit mission carried out	- Number of evaluations carried out - Number of audits carried out	0 0	2 2	Mid-term and final valuation reports Audits report	

3. Background and Situation Analysis

3.1 Background and Context

3.1.1 Geographic setting

Overview of the basins

The 3 transboundary basins extend over an area of almost 180,000 km², with Pungwe and Buzi covering each one almost 30,000 km², and Save Basin covering almost 110,000 km². They are the only ones shared bilaterally by Mozambique and Zimbabwe. The following map presents the 3 basins geographical extent.

Figure 1: Situation map of the Pungwe, Buzi and Save basins

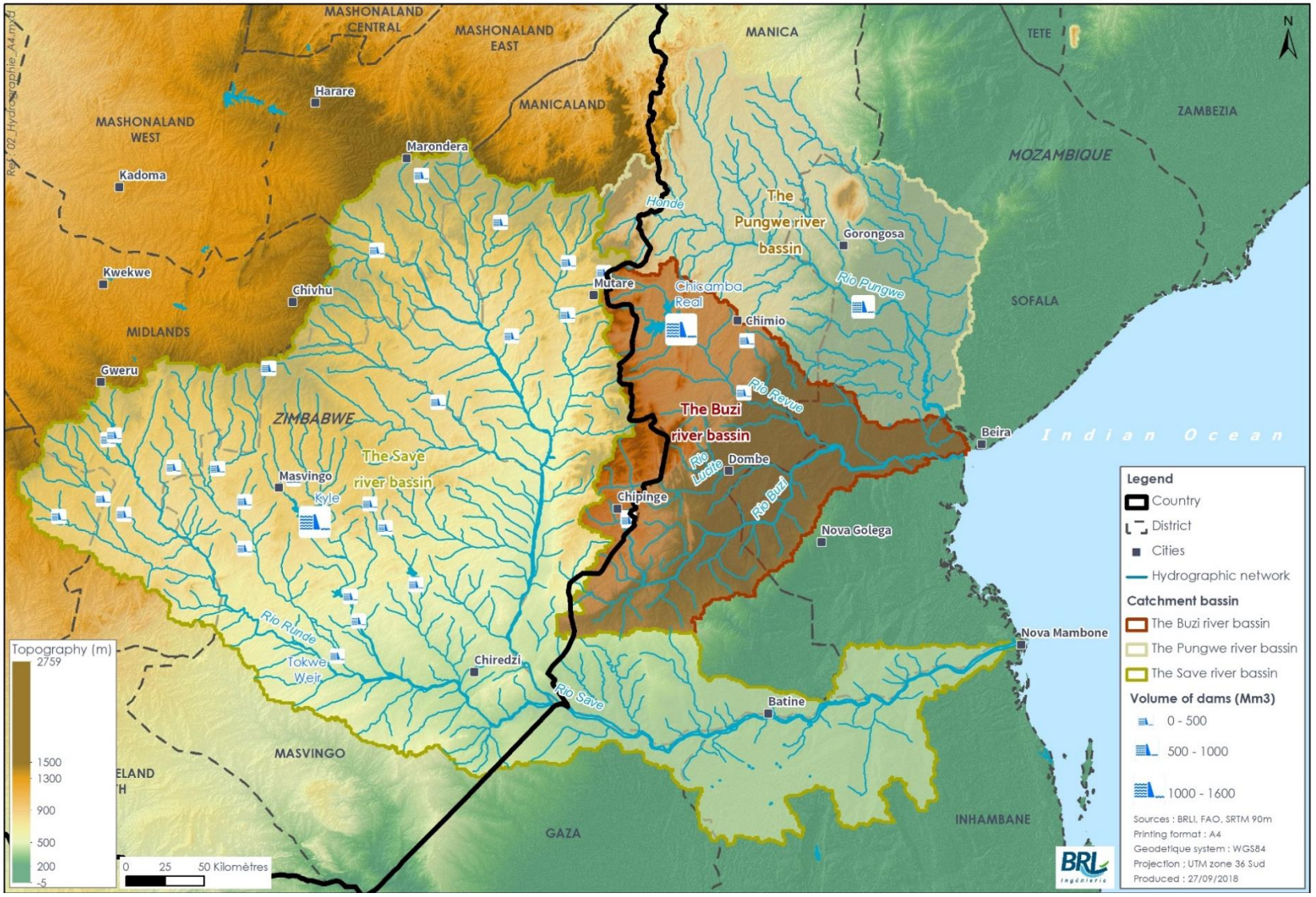
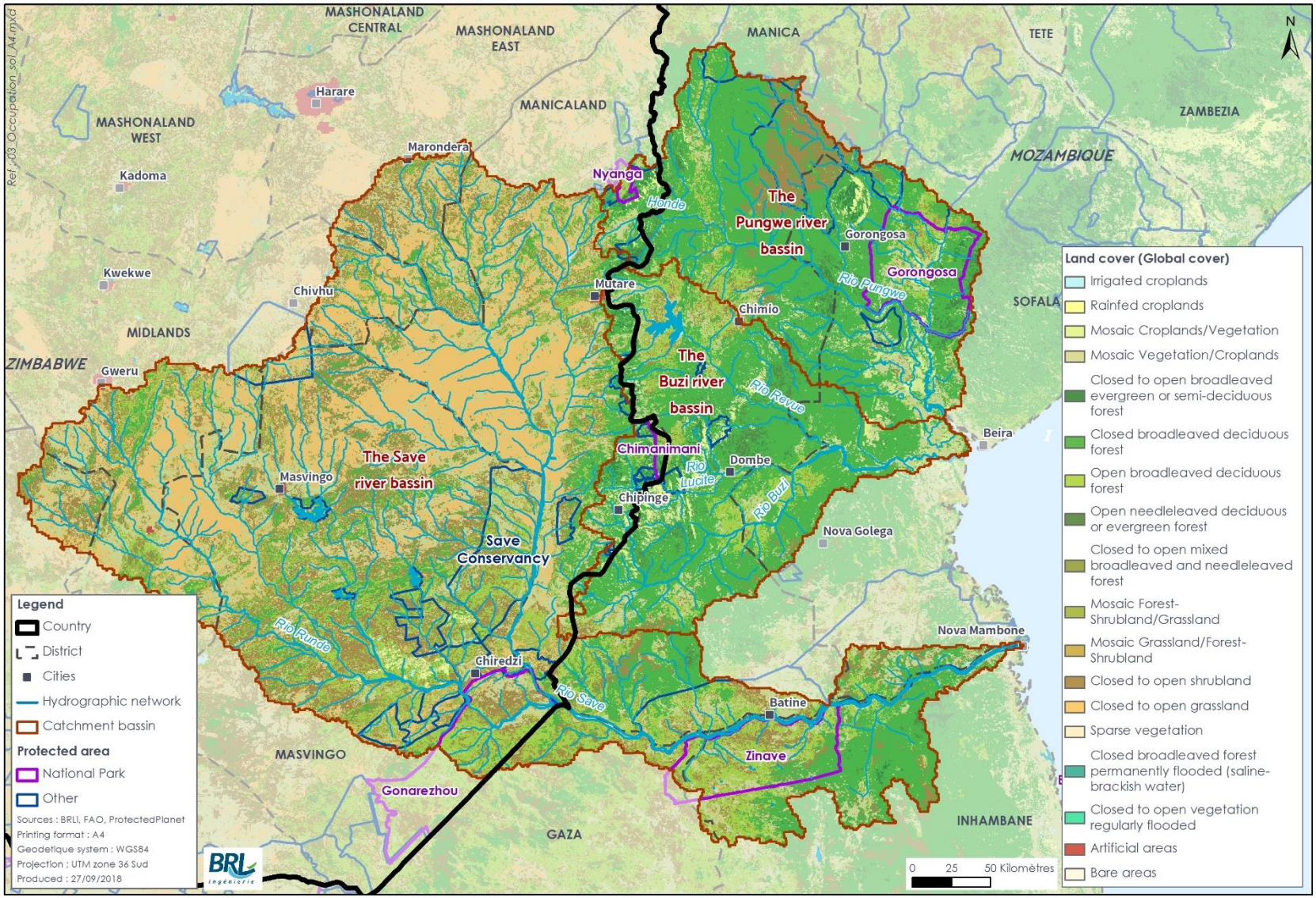


Figure 2: Land cover map of the Pungwe, Buzi and Save basins



Though Pungwe and Buzi basins have quite similar characteristics in terms of geographic and climate settings, the Save basin is rather different. The following table summarizes key characteristics and indicators for the 3 river basins.

Table 2: Key indicators for the Pungwe, Buzi and Save basins

		Pungwe	**Buzi**	**Save**
Area	**Mozambique**	29,700 km² *95 %*	25,200 km² *87%*	22,600 km² *21%*
	Zimbabwe	1,500 km² *5%*	3,700 km² *13%*	83,900 km² *79%*
	Total	**31,200 km²**	**28,900 km²**	**106,500 km²**
Administrative regions	**Mozambique**	Manica Sofala	Manica Sofala	Gaza, Inhambane, Manica, Sofala
	Zimbabwe	Manicaland	Manicaland	Manicaland, Masvingo, Midlands, Mashonaland East
Mean annual runoff	**Border flow**	1,200 Mm^3 *28%*	1,200 Mm3 27%	5,800 Mm^3 *85%*
	Estuary flow	4,200 Mm^3	4,500 Mm3	6,900 Mm^3
Population	**Mozambique**	1.1 million in 2003 *based on 1997 census*	1 million *census 2007* *68% rural*	0.1 million *based on 2007 census*
	Zimbabwe	0.1 million in 2003 *based on 2002 census*	0.2 million in 2010 *based on 2002 census* *93% rural*	3 million in 2010 *based on 2002 census*
	Total	1.2 million (2003) *Communities predominantly rural, except the Beira/Dondo metropolitan area in Mozambique*	1.2 million (2010) *1.9 million (projection 2030)*	3.1 million (2010)

Source: BRLi, derived from Pungwe monograph, 2004; Buzi monograph, 2011; Save monograph, 2011

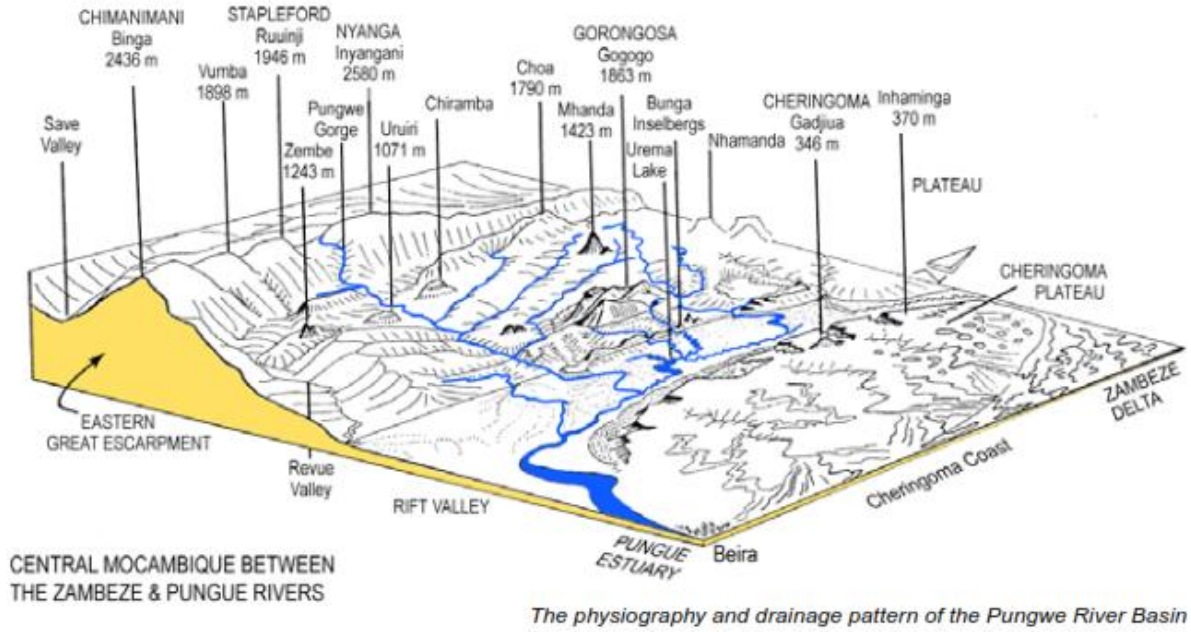
For the 3 basins, Mozambique is the downstream country, receiving both water and anthropic influence from Zimbabwe. Although Zimbabwe covers a small part of Pungwe and Buzi basins (respectively 5% and 13%), its contribution to their mean annual runoff is significant (respectively 28% and 27%). Save basin lies mainly in Zimbabwe (71%).

Zimbabwe has also developed quite intensively water uses in its national part for agricultural, hydropower and domestic supply purposes. Indeed, the Save basin is intensively dammed with more than 50 dams [source: Stakeholders consultation], regulating flows for irrigation canals and water transfers.

Pungwe Basin

The Pungwe River Basin is a 400 km long river having its source below Mount Nyangani in the Eastern Highlands of Zimbabwe. It then it flows eastward through the Manica and Sofala provinces in Mozambique. The western part has a humid mountainous climate in which the mean annual rainfall may be above 2,000 mm, and with fresh temperatures. In the eastern low-lying region near Beira, the climate is classified as tropical-humid, with seasonal rainfall concentrated during the warm season from November to April, and normally very little precipitation between June and October.

Figure 3: The physiography and drainage pattern of the Pungwe River Basin



The physiography and drainage pattern of the Pungwe River Basin

Source: Pungwe Monograph, 2004

An estimated number of 1.1 million people live along the Pungwe River. The basin is famous for its pristine environment, and its internationally famous Gorongosa National Park (GNP) in the plain and Nyanga National Park in the mountains. Water uses are quite developed in the upstream part of Zimbabwe for agriculture and hydropower, particularly in the densely populated valley of the Honde River, which developed irrigated fruit and vegetable production. Pungwe waters are also used to supply domestic water for the Mutare border town in Zimbabwe, which is however located in the Save Basin. On the Mozambican side, Pungwe River's abundant water resources, though already used for Mafambisse Sugar Estate and domestic water supply for several towns (including Beira), offers considerable potential for economic growth and development, provided constraints on water resources management can be solved.

The Pungwe Basin has the most pristine watercourses and ecosystems, except for the Penhalonga area polluted by mining activities. Pungwe River traverses two national parks of global significance, which are influenced by its flows:

The first is the **Nyanga National Park** in the mountainous part of Zimbabwe. It is the home of Mount Nyangani, the highest point in Zimbabwe. The park has an area of 472 Km², in which the weir enabling Mutare water supply is located. The vegetation is of the eastern Zimbabwe mountain forest-grassland mosaic, with patches of rainforest. The park is home to an important wildlife diversity with numerous species including cats, plains game and birds. The park is 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).

The **Gorongosa National Park** is located in Sofala Province in Mozambique and spans over the southern part of the Rift Valley. It was declared a conservation area in 1960 and covers an estimated area of 3,770 km² - almost 20% of the basin. Several rivers flow into the park from the mountain and plateau into Lake Urema. It flows out into the Urema River and then to the Pungwe River. The Park comprises extensive wetlands that offer a variety habitat for wildlife. The seasonally-inundated Gorongosa “tandos” occasionally links the Zambezi Valley with the Pungwe System in the south via the Urema Trough. The timing of water flow on to the floodplain and its eventual departure is crucial to maintaining the Gorongosa floodplain in a condition that supports varied, and potentially abundant, wildlife. An insufficient volume of water from the catchment or too rapid an outflow may result in a drier floodplain and subsequent changes in its habitats and fauna. [Pungwe Monograph, 2004].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, kudo, gondonga, nyala, oribi, chango, pala pala, waterbuck, blue wildebeest; 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.

Beira domestic supply canal intake

Beira domestic water treatment plant

Mafambisse sugar estate

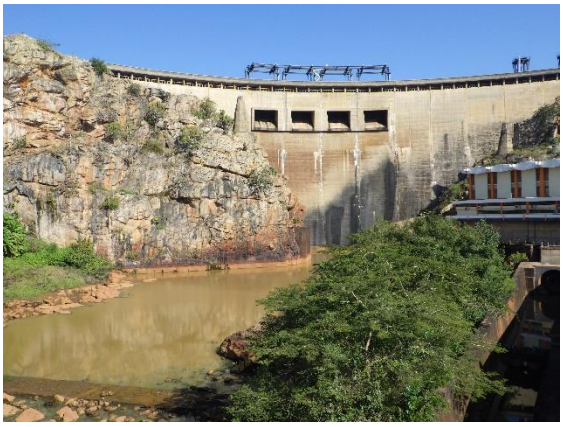
Source: BRLi

Buzi Basin

Three major tributaries form the Buzi River Basin; Buzi River, Revue River, and Lucite River with respective areas of 13,760km², 8,440 km² and 6,670 km². These three rivers are shared with Zimbabwe and originate from the western Chimanimani Mountains 2,500m high, hosting the Chimanimani National Park. 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 end lower regions to the east.

Major dams in the Buzi River Basin are limited to two hydropower dams, explicitly the Chicamba Dam (2,020 Mm^3, 15 MW installed) and the Mavuzi Dam (2 Mm3, 52 MW), 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 Buzi river basin is characterized by developed water uses by various large scale irrigation perimeters.

Chicamba Dam



Avocado irrigation perimeter

Source: BRLi

In the Buzi basin can be found the mountainous Chimanimani National Park. Although not very much connected to the rivers. The deforestation of the mountainous Chimanimani area is likely to be influential both for flows regulation and for water quality.

Save Basin

The Save River Basin encompasses a wide range of climatic types ranging from the mountainous climate with higher precipitation in the northeast to drier zones southwards in the Zimbabwean Low Veld, and somewhat more humid and tropical approaching the coast and the Indian Ocean in the eastern coast of Mozambique. 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 savannah vegetation types ranging from bush, shrub and grassland dominate. These cover 38% of the basin area, followed by agriculture at 33%, forest at 26%. The Zimbabwean Save basin has focused development of large, multipurpose dams: water resources are regulated by complex hydraulics infrastructure composed of dams (more than 50), irrigation canals and water transfers. The future development of the Runde-Tende and Chipinda Pools dams will see the Zimbabwean side reaching almost its full development potential. Mining is also a significant activity in the basin. Due to the high number of dams, quantitative water management is an issue, but on the other hand, this is the basin that offers most possibilities for flows regulation. However, due to the already existing uses, this possibility of operationalizing e-flows may be hard to implement and negotiate. The Buzi Agreement under negotiation may open the possibility of a water transfer of Buzi waters to the downstream Save (a feasibility study of the transfer will be required).

Banana field close to Mutare, with fruits protected against freezing

Low Veld with dry savannah landscapes

Source: BRLi

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.

About 9% of the basin that falls into Zimbabwean comprises of protected areas. The Save Basin counts several important wetlands such as the Gonarezhou National Park in Zimbabwe and Zinave National Park in Mozambique, together with some conservancy areas (Malilangwe, Save Conservancy along the Save River). Most of which are connected to the Gonarezhou NP (Batani, Twananai, Chibwedziva, Dzidzela, Chitsa, Mahenye, Mutandahwe) in Zimbabwe or the Zinave NP (Coutada official N°4 & 5) in Mozambique.

The Gonarezhou National Park in Zimbabwe is the only national park with permanent water points (permanent flows in the rivers). It hosts the confluence of the Runde and Save rivers, which is characterized by a set of pools and ponds seasonally inundated by the rivers, and that serve as water points for wildlife.

The Zinave National Park comprises a set of wetlands (pools, ponds, marshes) connected to the Save, and filled by Save floods. The biodiversity has reduced since the civil war due to poaching and habitat destruction. However, it remains an important area for some mammals and birds confined to the sand veld.

In addition, there are several other wetlands in the Save Basin:

- Riverine wetlands composed of small, localised floodplains and swamps occur along the main hydrological system. The confluence of the Save-Runde Rivers is an example of such a wetland type. The pools are more pronounced in the Runde River in the Gonarezhou National Park. Another set of pools is found upstream of the Pombazi River, a tributary of the Runde River
- Palustrine wetlands consisting of springs, pans, pools, lagoons and dambos. Dambos are found mainly in the highlands and at headwaters of most streams, especially in the central eco-region.
- There are several natural lakes and small bodies of water near the river in Mozambique.

In the estuary areas

The three river systems drain into coastal estuaries which are key to a variety of biodiversity.

The mouth of the Buzi Estuary is linked to the Pungwe's, and they reach the ocean in Beira. Inland, the seasonally inundated grasslands of the lower Pungwe/Buzi floodplains comprise approximately 4,500 km² of wetlands [Pungwe Monograph].

The mangrove area along the estuary and southwards belongs to the Eastern African Mangrove ecoregion listed within the Global 200 priority ecoregions for conservation considered as critical or endangered. Over time, increasing human pressures have led to the degradation of the wetland ecosystem through pollution (drainage from irrigated fields and poorly treated urban and industrial waste water) and land use change (particularly urbanization around Beira for commercial and industrial activities). Maintenance of adequate water flow regime from both Buzi and Pungwe rivers is of significant importance for the maintenance of this key ecosystem, with alternation of freshwater and brackish water. However, the balance also needs to take into account human needs. Seasonally during low flows, marine salinity flows back in the estuary and the downstream part of the Pungwe. These last years, this phenomenon affected Mafambisse Sugar Estate abstractions, and Beira drinking water supply which had to move its intake upstream to avoid supplying slightly saline water seasonally.

The estuaries regions and the mangroves area are ecologically connected to the Banco de Sofala, which fish and prawns resources are the most important fishing resource in Mozambique. The Banco de Sofala is influenced both by marine streams that create specific conditions in terms of temperatures and nutrient movements, and river flows that induce an important dilution of the Ocean's superficial waters salinity (from 35g/L in the oceanic platform to 20g/L in the Zambezi mouth). These conditions host an important marine biodiversity, and in particular favour the reproduction of fish and shrimps. It is the best area for commercial

fishing in Mozambique. The Beira estuary is also a habitat for juvenile and sub-adult shrimps although there are no data available to enable an assessment of the importance of the estuary as a nursery for the shrimp stocks along the coast and on the Sofala Bank. The ecology of the area is not well known, but it is very likely that the combination regime of freshwater and brackish water, together with sediment load is constitutive of the habitats of the Banco de Sofala.

3.1.2 The Political, Social and Economic Context of the Riparians

Mozambique

Mozambique is a developing country with a steadily growing economy that is being rebuilt since the 16-year civil war ended in 1992. The growing political stability has led to significant improvements in the country's economic growth rate. The country is more stable after a 2016 debt crisis that was triggered by an economic slump, but growth prospects are limited. Gross domestic product (GDP) growth was an average 3.8% in 2016 and 2017.

At a national level, Mozambique has adopted a comprehensive reform towards integrated water resources management (IWRM) through drafting water management policies, legislations, legal frameworks and organizational setups. Examples are the 1991 Water Law as well as the 1995 Water Policy, which are explained in the following sections. Land ownership in the country is vested in the state through three forms of tenure: customary regime, good faith occupation, and official demand. The local community uses the land under customary practices (land used hereditary by communities and managed by the traditional land leader), with recognition by the local authorities. This land is generally used for traditional agricultural livelihoods (subsistence gardens, animals rearing).

Mozambique has made great strides in reducing poverty, but nearly 50% of the population is still living in poverty, progress has not been fast enough. Absolute poverty still affects 54% of the population. Poverty is concentrated in rural areas, which are dominated by agrarian based livelihoods dependent on the availability of water. Agriculture is the cornerstone of Mozambican economy (one third of the GDP, 80% of labour force), and the largest water user. Most of the population derives its livelihoods from subsistence agriculture, mostly rainfed. The commercial fishing of the Banco de Sofala encompassing the region from the Save river mouth (Foz do Save) in Inhambane Province, to the Zambezi River. Water is also used for hydropower along the PUBUSA basins. In the Buzi Basin, small hydropower stations exist on Chicamba Dam (2MW) and Mavuzi Dam (2 MW).

Mozambique's social development will thrive with more a rising water demand. Population stand about at 29million, 80% of which lives in rural areas. There has been significant improvements in education in Mozambique. The abolition of school fees in 2003/04 and provision of direct support to schools saw a surge in primary and secondary school enrolments Primary school enrolment now stands at 97% and the adult illiteracy rate is 51.9%. Malnutrition remains problematic with ¼ of children under the age of 5 being underweight. Feeding the growing population and achieving food security will entail close to double the current water demand. This will be further exacerbated by growing domestic water requirements. Currently, only 49% of the population has access to safe water and 46% access to adequate sanitation (NHS 2003). Since 1990, total sanitation coverage has increased to 21%, but the disparity between urban and rural coverage remains great: 44% urban vs 11% rural. The lack of improved sanitation costs Mozambique about 4 billion Meticais a year, due to premature deaths, medical costs and losses to productivity.

In Mozambique, there are more women than men in the basins (inherited from civil war) , and thus this statement remain valid for Pungwe and Buzi basins (INE, 2007). However, women lag behind men in many socio-economic indicators such as access to education and other services and literacy. According to traditional roles, men enjoy prominence in society: practice

of polygamy, larger influence in social networks, higher education and labour market participation. For instance, the literacy rate is 67% for men and 36% for women in the country (UNESCO, 2010). The proportion of women who can speak Portuguese, which is necessary for employment in most sectors of the economy in Mozambique, is even lower, twice as low as for males (Buzi Monograph, 2011). As such, access to means of production, including water and land, is heavily skewed in favour of men.

Zimbabwe

Despite recent challenges, Zimbabwe is a democratic republic that has created a progressive water governance framework. Since it won independence from colonial rule in 1980, the country has gone through some troubled times including sanctions imposed by the West over human rights issues, but it remains a democracy with an elected legislature and majority rule. After a disputed election in 2008, a democratically constituted government of national unity ran the country from 2009 to 2013. This has allowed not only a comprehensive water policy to emerge, but also land and environmental legislation that accommodate effective transboundary water cooperation, as elaborated in the following sections.

Land tenure in Zimbabwe is divided into the titled, commercial farm land, and the communal rural land governed by customary law and land tenure. In the year 2000, a hastily implemented land reform programme, designed to take land away from white commercial farmers for redistribution, vastly altered land tenure rules, water use, agricultural production and ultimately, national economic performance. Land under the redistribution programme is now under a developing tenure reform, where landholders enjoy user rights through a government lease programme that is still to be fully defined. On the other hand, in the communal areas, the open access to communal land and its natural resources by people and their livestock under the customary agricultural system has inadvertently created a classic 'tragedy of the commons' scenario. Poverty and natural resource degradation have therefore become endemic in communal areas and many households, especially in the Save Basin, barely subsist, and have to look out for government handouts each season.

The country's economy has suffered some mixed fortunes in the past three decades. While GDP growth is generally positive up to 2000, except for the unprecedented drought in 1992, after 2000 the growth rates drops precipitously to -12 per cent in 2003 and 2008. Economic growth picked up significantly with the formation of the government of national unity in 2009, but again dipped post 2013 and remains suppressed to date. This was mainly due to the land reform programme, which slowed down an economy that depended mostly on agriculture, a sector that produced about 20% of national GDP before the year 2000.

According to the World Poverty Clock, a third of Zimbabweans – 5.6 million people – live in extreme poverty. In the Pungwe Basin, three-quarters of Zimbabwean rural households earn insufficient income to meet their basic needs. In the Buzi Basin, half to 2/3rd of Zimbabwean households were classified as poor in 2003 (and this figure increased by 10 to 30% in less than 10 years, between 1995 and 2003)[1]. This places the basin populations at very high levels of climate risk given their agrarian livelihoods, as they have no safety nets should a cropping season fail.

Agriculture still accounts for over 70% of water use nationally, followed by domestic water supply and industry. Within the PUBUSA basins, the Zimbabwean portion of the Save Basin presents some interesting statistics. It is intensively dammed by over 50 structures, with complex regulation systems including water transfers. Main dams include Tokwe Mukorsi, Mutirikwi, Osborne, Manjirenji, Ruti, Bangala, Muzhwi, Siya and Mushandike. The purpose of these dams are mainly to supply downstream agricultural areas with water during dry season,

[1] Buzi Monograph, 2011

but are also in some extent used for water supply to urban centres and hydropower generation.In the Pungwe basin, a set of hydropower plants has been built in the Zimbabwean part (1 to 3.75 MW installed), the biggest being Pungwe B (15 MW installed).

The social structure of the country points to a growing demand for water. Zimbabwe's current population stands at nearly 17 million, of which 69 per cent are based in the rural areas. The median age of the population is 19 years. Over 3 million people live in the Save River Basin in Zimbabwe.The national official statistical data for 2017 puts Zimbabwe's adult literacy rate at 94%, the highest in Africa. However, the United Nations Educational, Scientific and Cultural Organisation suggest a lower figure of 86 % for Zimbabwe in 2015. In Zimbabwe, most children attend primary school, but about 10% are not in school because of various reasons.

Zimbabwe's rural water supply programme made significant inroads in the provision of safe drinking water in the river basins, especially during the 1980s. However, progress has since waned due to diminishing budgetary allocations. As a result, community water, sanitation and hygiene (WASH) projects are now largely funded by donors and international organisations. Community water supplies usually consist of a borehole or deep well, fitted with a hand-pump to supply clean water for household use. However, according to UNICEF, Zimbabwe's water and sanitation situation remains relatively poor in both urban and rural areas. Nationally, 18 per cent of the population does not have access to improved drinking water sources; but this rises to over 30 per cent for households in the Save catchment without safe water supplies. Rivers, as witnessed by the field mission team, are sometimes used for household use, such as for washing clothes and bathing. In the dry season, households sometimes dig shallow wells in silted river beds for drinking water, as well as to water their livestock.

A gender perspective shows women as carrying the bigger burden, and therefore higher risk, in the use of water. Although the literacy rate is equal between men and women: 89% versus 88% (UNESCO, 2015), poverty incidence and vulnerability is higher among female-headed households than among male-headed households (Save monograph, 2011). Most of community health workers in the towns are men, although the correspondent activities are socially more attributed to women (Pungwe Monograph, 2004).Because of the historic social construct of gender, women are the principal family providers in rural areas, and in particular ensure food preparation, fetch domestic water, ant ensure proper sanitation is available. In rural settings in particular, it is common knowledge that most human labour for agriculture, especially in irrigation farming, is supplied by women, although few of whom have land and water rights that entitle them to a say in policy-making decisions which relate to land and water.

3.2 Global environment problem

The environmental issues identified in the Pungwe-Buzi and Save can be summarized as follows:

Floods: In 2000, the passage of Cyclone Eline provoked destructive floods, particularly in the Central and South regions, with more than 700 death casualties, 500.000 displaced people and 12% of cropped area lost. The Mozambique floods of 2000 caused a 23% reduction in GDP and a 44% rise in inflation (WWDR 3). Floods are considered as a national priority. Zimbabwe was also very much affected, though not to the same extent. The 2019 Idai cyclone caused more than 600 death casualties in Mozambique and more than 340 in Zimbabwe, with damage estimated by the WorldBank over 3 billion USD in the affected region.

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. Apart from the major threat of climate change, alterations to land use within the basin can affect the magnitude and frequency of floods. Flooding has devastating effects, particularly in areas with high population density and without adequate early warning and emergency response systems in Mozambique. 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 agribusiness; 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, characterized by erratic rainfall. It generally becomes an *agronomic drought* when irregularity of rainfall causes crop failure and pasture decrease that affect rainfed farmers and livestock keepers, 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.

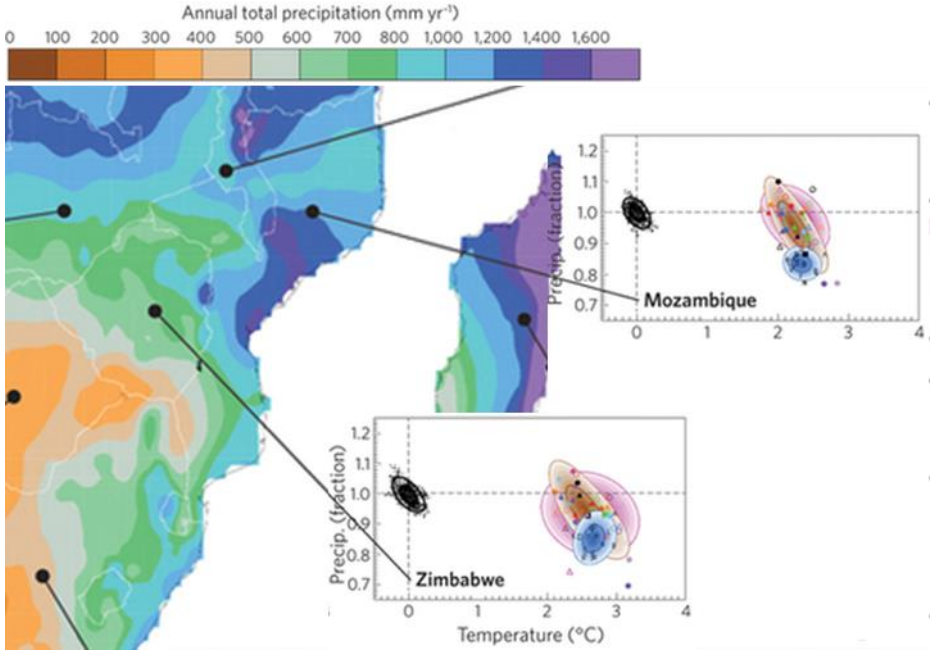
A meteorological drought usually precedes *surface water and then groundwater drought*. The development of flow regulation and storage infrastructure, particularly in the Save basin, enabled to reduce climate vulnerability of farmers accessing to irrigation. Further water uses developments are also planned in Pungwe and Buzi basins. However, on severe drought years, water flows, even regulated, can become insufficient to supply all demand, and in that perspective, ecosystems needs (e-flows) are often becoming a low-level priority. However, downstream flows are likely to be very influential on the Banco de Sofala and its fish/shrimp resources. This also raises concerns regarding transboundary allocation of water. With climate change, the extreme events frequency is expected to increase, and thus the anthropised system developed to reduce vulnerability may become vulnerable again. This may be particularly true for the Save basin: the difficulties in maintaining sufficient release for downstream uses and ecosystems in the Save basin raises reflexions on the possibility of a water transfer from Buzi basin to downstream Save.

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 rained 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). Both countries regularly rely on food aid.

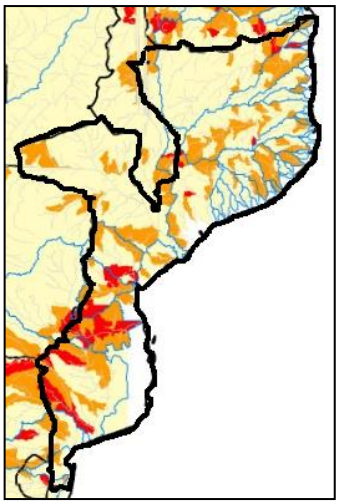
The onset of a drought is slow and very different from flooding with respect to the size of the affected area, the duration, the measures that can be taken to mitigate the impacts of the hazard and the ability to forecast the onset of the disaster. The improvement in recent years in seasonal and long-term climate forecasts, 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.

Climate Change: despite the local impacts of climate change on water resources and on related socio-economic activities in the 3 basins are not well characterized. A recent regional study, at the scale of SADC region, led by the Grantham Research Institute on Climate Change and the Environment, provides strong evidence of the physical and socio-economic exposure climate in the area (Conway D., et al. (2015). "Climate and southern Africa's water-energy-food nexus"). The projections conclude in a possible decrease in annual precipitation (see Figure 1), as much as 20% by 2080, impacting negatively water availability and crop yields.

Figure 4: Average annual total precipitation and projected changes in national average annual precipitation and temperature (adapted from Conway D., et al. (2015)).



In Mozambique, models predict an increase in temperatures between 1.5 and 3 degrees in 2050 (INGC, 2009), an increase in the intensity of cyclones (already observed), an influence of the increase of sea levels on flooding patterns, an increase in floods frequency as presented on the map (>+25% in red, between 10 and 25% in orange), a decrease in food production and agricultural productivity (18 to 33% losses for millet production).



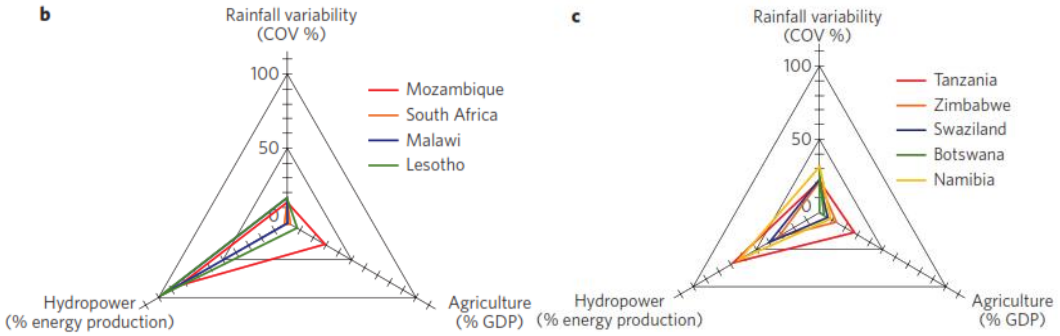
Climate change impacts on the water-food-energy-ecosystems nexus.

Food & energy production sensitivity to climate variability

(Conway et al, 2015)

Conway D., et al. works ("Climate and southern Africa's water-energy-food nexus") clearly show that energy sector is highly sensitive to climate variability in both countries, as hydropower represents a high share in national energy production.

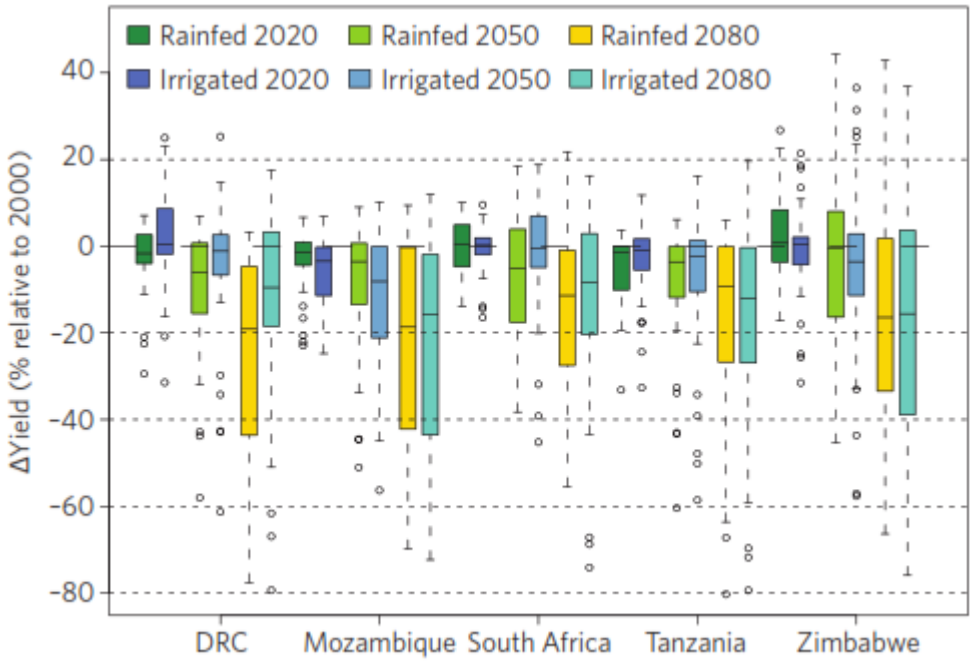
Figure 5: Food and energy security sensitivity to climate variability (based on reference timeseries from 1984) (adapted from Conway D., et al. (2015)).

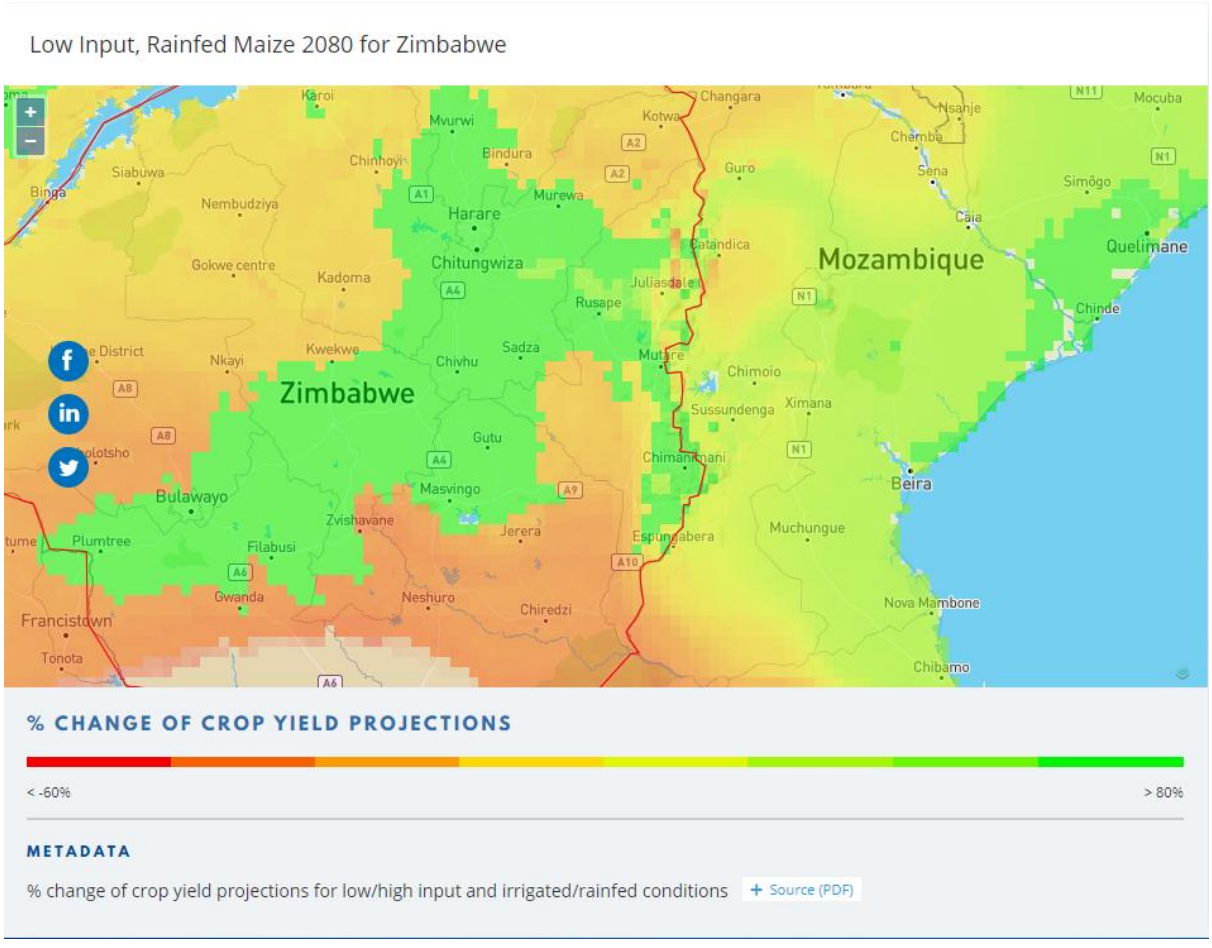


Focus on agriculture sector

For food production, despite projections tend to depict a decrease in crop yields at national level for both rainfed and irrigated agriculture at medium and long term (Figure below, Conway et al.), other sources suggest different situations depending on the catchment. The indicators developed by the World Bank Climate Webportal suggest that crop yields could indeed be negatively impacted in the lower plains of the Save basin. On the contrary, crop yields could be positively impacted in the upper parts of Pungwe and Buzi basins (see Figure below, World Bank Webportal).

Figure 6: Simulated climate change impacts on rainfed and irrigated maize yields (1 - adapted from Conway D., et al. (2015) ; 2 - World Bank Webportal - https://climateknowledgeportal.worldbank.org)).

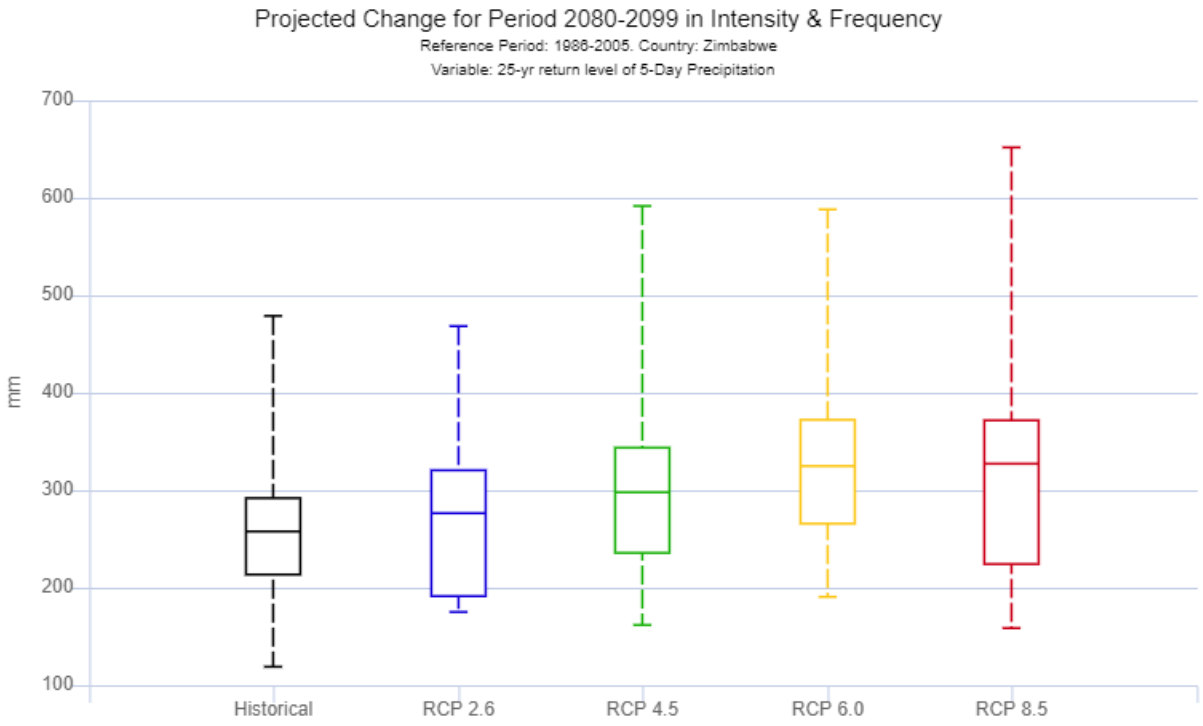




Disaster risk (flooding, drought, cyclones, etc.)

The hydrological indicators used to depict disaster risk suggest that extreme events intensity and frequency could slightly increase in the PuBuSa basins (Diagram below).

Figure 7: Projected change for 2080-2099 of the 25-year return level of 5-day precipitation (adapted from World Bank Webportal - https://climateknowledgeportal.worldbank.org)



Pollution and water quality concerns: Diffuse or point source 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), which although generally non-consumptive, 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. Localized pollution occurs frequently with mining activities in Zimbabwe. The pollution could lead to serious environmental degradation, water contamination, and negative impacts on human health.

Negative impacts also 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. Saline water intrusion in the estuaries has negative effects on the agricultural production, and triggered strong adaptation measures such as moving upstream Beira abstraction point, and connecting it to the Sugarcane irrigation perimeter of the Mafambisse Sugar Estate. 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.

Deforestation and land degradation: Forests resources are highly solicited for the production of charcoal for domestic energy consumption, and for large-scale timber exploitation. 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.

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.

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.

Coastal ecosystems degradation.

Mangrove habitats render crucial services, for the stabilisation of coastline, the attenuation of storms and waves they provide, the bio resources they produce (wood, fish, shrimps) or contribute to produce (possible spawning areas/role in the ecology of fish and shrimps for the Banco de Sofala). Mangrove degradation is occurring in the Pungwe and Buzi estuaries, with destruction of habitats due to urbanization in the Beira area with industrial and commercial activities, coastal erosion, and wood-cutting by riverside communities. The extent of this degradation is not well documented.

The Banco de Sofala is the richest fish and shrimp resource in Mozambique. Fishing activities both commercial and small-scale enable both important economic benefits and subsistence livelihoods. However, the increase of fish catch combined to environmental change induce high risk of disturbance of biological cycles in this area, with possible short to medium-term effects on the bio resources, fish catch and thus on the economy.

Both these coastal ecosystems are likely to be sensitive to changes in flow regime, sediment load and water quality induced by human activities (and marginally by climate change), with the risk to threaten the ecosystem vital functions and to endanger ecosystems services & derived economic activities. The Fish Research Institute in Mozambique (IIP) estimates that the pressure on resources impacted fish reproduction and growth in the past years. There are evidences showing an ecosystem change, with fish not attaining adult size considered as an indicator of overexploitation, with the appearance of invasive species (camarão albino). Both MITADER and MIREME agree on the impact of water pollution on coastal ecosystems, due in particular to mining activities, but also to navigation and harbours.

Most of these environmental concerns have transboundary dimension.

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.

3.3. Threats, roots causes and barriers analysis

3.3.1 Threats

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).

- **Urbanization** is a global trend observed locally in the Pungwe, Buzi and Save basins as a response to rural exodus for employment. Urbanization is concentrated in and around main urban centres such as Chimoio, Gondola, Manica and Buzi in Mozambique and Chipinge in Zimbabwe, and to a lesser extent in and around smaller towns and district centres. Urbanization imply concentration of population and activities, and thus growing pressure on natural resources: increase of water abstraction for domestic and industrial demand, pollution aggravation, land consumption and soil sealing.

Satellite view from Beira city and its surrounding degraded mangrove

- **Poor land use practices:** Despite observed migrations towards urban centres, population growth is also observed in rural areas. Unsustainable agricultural and cattle-rearing practices are due to population pressure, to lack of awareness, lack of investment capacity, land tenure, and diverse difficulties that make small-scale agriculture livelihoods erratic: land holding capacity for cattle is often exceeded, access to water point is not well managed, and soils are suffering from degradation and erosion.

Soil erosion in the Save basin's Veld

Bank erosion in the Save basin

Source: BRLi

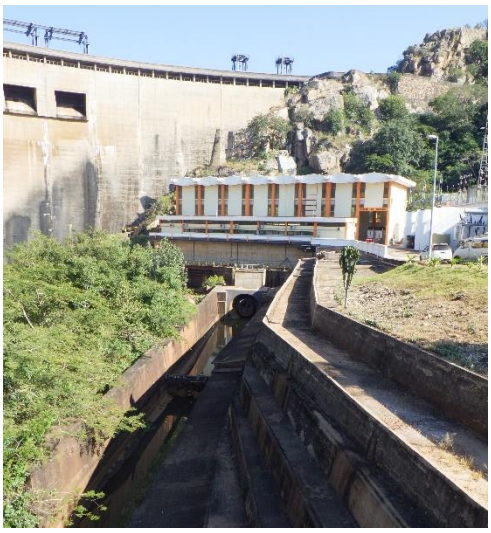
Sand banks and river bed widening in the Save-Runde confluence

Source: BRLi

- **Water for development:** Economic development and population growth in the basins have required more water for domestic purposes and for activities development (for example, irrigation, power production, industry and mines). Water abstractions peak is often during low water periods, and aggravates the quantitative pressure on ecosystems and downstream uses. This water demand required the development of water regulations and storage: to be able to meet growing water demand, Zimbabwe has built more than 50 dams in the Save basin. Although the Zimbabwean legal framework and bilateral agreements impose to release environmental flows, this is not systematically respected, and the computation of environmental flows is not accurate, often based on statistical methods more than on actual ecosystems needs.

Irrigation in Zimbabwean Save basin

No e-flows release from Chicamba dam (Mozambique)



Source: BRLi

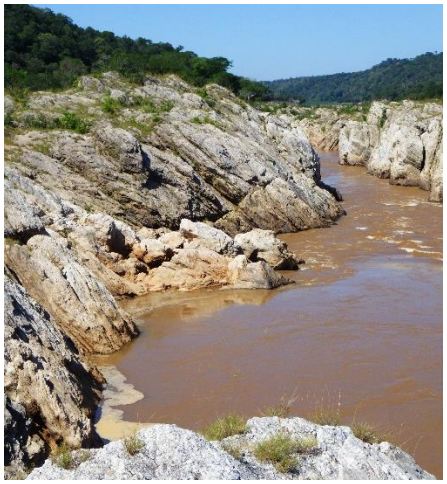
- **Overexploitation of natural renewable resources**: The economies of Mozambique and Zimbabwe are both based on the exploitation of natural resources. While economic development may lead to ecosystem decline, ecosystem services in the three basins underpin economic development, so the real challenge 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.

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.

Illegal gold panners in the Pungwe river bed in Mozambique

Turbid water and foam at Pavua dam site (Mozambique)



Source: BRLi

- **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. 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. 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 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 estimate 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 purposes

Deforestation in Chimanimani mountainous areas (Mozambique)

Source: BRLi

- **Mining and Industry development:** Water resources in the three basins are a key resource for industrial and manufacturing processes. However, their development has impact on the same water resources they use, both in terms of water abstraction and water pollution. Generated wastewater can cause environmental damage when discharged untreated, which is generally the case.

  There are a growing number of investments in mining and associated processing facilities. 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. Exploitation of minerals in the Buzi basin consists of quarrying activities being undertaken by Job Crushers in Mutare rural, 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. 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.

  Gold mining activity is particularly developed and is the object of the development of the next paragraph.

- The **pollution discharged by gold mining activities** in the basin dominate the water quality of the Pungwe and Buzi River surface water. A special study within the Pungwe Project (PP2) has been focused on the impact that gold mining has on the aquatic environment.

- In the Pungwe basin, before, these activities mainly took place in the surroundings of the tributary Nhamacurara River in Manica Province, which are, at some places, destroyed. As of today, the informal gold mining activities have spread in the Pungwe River basin (Penhalonga area, Muda river downstream) and even in the Gorongosa area close to the National Park.
- In the Buzi basin in Zimbabwe, artisanal gold mining is also common, with a particularly active gold mining area in the Lucite catchment in Manica Province. 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.
- When measured in 2009, the water quality in the Save Basin was generally satisfactory; though some samples were in the yellow and red categories. Rivers such as Odzi, Sakubva, and Dora were becoming problematic, especially due to effluent from mines. At the time, water quality was beginning to deteriorate due to gold panning. Since diamond mining activities were ramped up, water sample showed that water quality in the Singwizi and Odzi Rivers had declined significantly. The samples fell into the yellow and red categories.

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 far-reaching 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.

- **Intensive agriculture development**: several large scale irrigation perimeters have developed in the basin (Hippo-Triangle sugar estates in Runde (Save tributary) basin, Mafambisse sugar estate in the Pungwe Basin), with associated water needs and possible diffuse pollution.
- **Unsustainable fishing practices:** 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 depend on ecosystems health. Fishing activity can be severely affected by pollution, particularly from agriculture and mining, but also by its own overpressure on fish stock or ecosystems components. For example; if the shrimp industry in the Sofala area (in the Pungwe-Buzi River Estuary region), very significant for the national economy, remains at the current exploitation

levels, together with the destruction of mangroves and the practice of trawling on seagrass beds, shrimp species and entire fish populations will decrease dramatically

- **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.

  Climate change in combination with environment degradation (e.g.: 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

3.3.2 Root causes

- Population increase in Mozambique and Zimbabwe is documented in paragraph 3.1. Growth rate in the Save basin is considered to be 1.01% in Zimbabwe. In Mozambique, the growth rate in Inhambane and Gaza provinces is equivalent (1.1% and 1.4%), although in Sofala and Manica it is much higher (2.4 and 3.7%) [Save Monograph, 2011]. Without appropriate policy measures and associated enforcement, growing population implies growing water needs for domestic supply and human activities, growing pollution, in a nutshell: growing pressure on ecosystems.

Increasing regional water demand, particularly in the Save basin is largely influenced by population growth, urbanization, and 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 and the past political instability that confined most of the large mammals to existing conservation areas. In this regard 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.

- **Poverty** is a major concern in the 3 basins. Poverty levels are highest in rural areas where communities are most dependent on direct exploitation of natural resources for their survival and livelihoods. Although there is economic growth, the poverty gap is widening across Sub-Saharan Africa. Poverty and inequality, coupled with lack of alternative options, drive communities to use unsustainable practices of resource exploitation, which threaten sites, species and ecosystem integrity. Poverty is thus linked to **communities dependence on natural resources**;
- **Absence of alternative livelihood opportunities**: communities are often constrained or driven to carry out unsustainable practices of land use or natural resource exploitation by a lack of alternative options. This can be the result of a variety of factors (specific to the community or location) – inability of communities to access ideas, technologies or funding support to initiate alternatives;
- **Unsustainable natural resources management practices** are very widespread (overgrazing, deforestation & uncontrolled tree cutting…) and lead to increased erosion of land, sediment load, and loss of biodiversity. This is linked in particular to poor land use planning and land tenure system;
- **Weak compliance with environmental regulations.** In both countries, enforcement of environmental laws and regulations is very limited. Arbitrations between environmental and long term benefit and short-term economic benefits often give the priority to the 2nd;
- Limited knowledge of:
  - ecosystems characteristics and functioning,
  - ecological status of degradation,
  - economic value of ecosystems services (including bio resources exploitation).

3.3.3 Barrier analysis

- **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.
- +Weak institutional enforcement capacity for breaking the law and regulations, for private sector framing, for application of the polluter-pays principle, + Weak institutional coordination and functional fragmentation (particularly for law enforcement)
- **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.
- **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 e-flows 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 (e.g.: biodiversity hotspots of the Nyanga National Park in Zimbabwe and the Gorongosa National Park in Mozambique).
- **Barrier # 7: Inadequate coordination in the planning, decision making and enforcement at the basin level:** This is needed to respond to the growing economies related to these basins (e.g.: 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.

- **Barrier #9: Inadequate capacity for environmental laws and regulation enforcement.** As in many countries, environment often ranks behind many other sectors in the list of decision-makers priorities. Environmental protection should be included in other sector's planning and activities either through incentives or through environmental law enforcement. Many dispositions for environmental protection already exist in the legal framework, however, they are not put into action because of insufficient weight given to environmental law enforcement, lack of coordination between services, and political interference. For instance, the economic benefits derived from mining activities both at the lowest level with livelihoods of gold panners, and at the highest level with the gross income generated by this activity predominates over environmental degradation and risk for downstream communities health, although some economic activity also suffer (for instance, an agro-industry planning to develop an irrigated perimeter in the Buzi basin did not settle after it analysed water quality downstream Lucite area.
- **Barrier #10: Lack of sustainability of projects activities.** Many programmes have been supporting water management in Mozambique and Zimbabwe. However, many activities did not have the expected spinoffs in the long term because of lack of sustainability (lack of maintenance of stations, lack of personnel for running the models …). This may be due to many factors that need to be analysed in any new programme (such as low quality of materiel purchased, inadequacy of the tools developed in relation to expectations, lack of means dedicated to maintenance/running of tools (stations, models, …), so as to put in place mitigation measures.
- **Barrier #11: Lack of permanent incentives for community management of natural resources.** Several initiatives in both countries have been dedicated to community management of natural resources, such as CAMPFIRE in Zimbabwe, SIDAPBB in Mozambique. However, when projects end, some of the governance structures and activities implemented suffer from budget termination. For instance, some Comites Locais de Gestão de risco de Calamidades in Mozambique suffer from lack of follow-up in training, or replacement of tools of the flood management kit.

3.4. Institutional, sectoral and policy context

3.4.1. Overview of the current legal and policy setup

The following table synthetises the main framework texts (legal, policy and planning documents) for the water resources management of the Pungwe, Buzi and Save basins.

Table 3: Inventory of key regulatory, policy and planning documents

	Transboundary	Mozambique[2]	Zimbabwe[3]
Regulatory framework	- SADC revised protocol on shared watercourses (2006)	- National water law (1991) - Lei de gestão de Calamidades (2014) - Regulation of Licenses and Concessions of Water (2007).	- Water Act (1976, rev 1998, rev 2002) - ZINWA Act (1998) - Water (Permits) Regulations, Statutory Instrument (SI 206 of 2001);

[2] http://www.limpopo.riverawarenesskit.org/LIMPOPORAK_COM/PT/GOVERNO/WATER_GOVERNANCE_IN_THE_LIMPOPO/NATIONAL_POLICIES_AND_LAWS/MOZAMBIQUE.HTM
[3] http://www.limpopo.riverawarenesskit.org/LIMPOPORAK_COM/PT/GOVERNO/WATER_GOVERNANCE_IN_THE_LIMPOPO/NATIONAL_POLICIES_AND_LAWS/ZIMBABWE.HTM
https://training.fema.gov/hiedu/downloads/compemmgmtbookproject/comparative%20em%20book%20-%20chapter%20zimbabwe's%20emergency%20management%20system.doc

	- Bi-lateral Agreement for the establishment and operation of a Joint Water Commission (2002) - Pungwe agreement (2016) *Buzi and Save agreements under negotiations*	- Governmental decrees creating the delegated management framework for urban water supply (1998) - Law on Environment (1997)	- Water (Waste and Effluent Disposal) Regulations, SI 274 of 2000; - Water (Establishment of Catchment and Sub catchment Councils) Notice, SI 209 of 2000; - Water (Catchment & Sub catchment Councils) Regulations SI 33 & 47 of 2000 - Environmental Management Act (2002) - Civil Protection Act (2001) - Mines and Minerals Act (2015) - Urban Councils Act (2015) - Rural District Councils Act
Policy framework	- SADC Regional Water Policy (2005) - SADC Regional Water Strategy (2006) -	- Water Policy (2007) - National Strategy for water resources management 2005-2017 (2007) - National rural water and sanitation strategic plan (2007) - National policy on disaster management (1999) - Water tariff policy (1998) - National irrigation policy (2002) - Climate change strategy (Respondendo às mudanças climaticas em Moçambique) (2012)	- Water Policy (2012) - National Water Pricing Policy and Strategy - Environmental Policy (2009) - Zimbabwe's national Climate change response strategy - Water Resources Management Strategy for Zimbabwe, 1999/2000
Planning	- SADC Regional Strategic Action Plan on IWRM and Development (5-years phases since 1998) - Pungwe Monograph (2004) - Buzi Monograph (2011) - Save Monograph (2011)	- INGC Masterplan - Annual contingency/emergency plans - Planos estrategicos de desenvolvimento distrital (5 anos) / Planos anuais de orçamento distrital (yearly) - Strategic plan for meteorological development (2013-2016) - Plano director para prevenção e mitigação das calamidades naturais	- National Environmental Plan yet to be elaborated based on the district-level plans

		- Masterplan for mangroves conservation (under development)	

3.4.2 **Regional governance framework**

At regional level, several tools have been jointly developed and are a basis for joint water resources management. Mozambique and Zimbabwe are committed to harmonising their national environmental, water and disaster mitigation policies in accordance with the UN Convention and the SADC Revised Protocol. In particular, the joint integrated management of their shared river basins will be achieved through the application of integrated water resource management principles. The JWC will advise the two countries on the conservation, development and use of shared water resources, but all decisions taken by the Commission will be based on consensus reached between the respective delegations.

The SADC Revised Protocol on Shared Watercourse Systems

Mozambique and Zimbabwe are signatory parties of the SADC Revised Protocol on Shared Watercourse Systems which recognises the principles of UN Watercourses Convention and includes specific provisions for equitable and reasonable utilisation, the obligation to prevent significant harm, and notification of planned measures. The Protocol was signed in 2000 and came into force in 2003 and stands as a regional legal framework to which all national laws and policies must conform.

It supports and directs the establishment of shared watercourse institutions and agreements, together with the implementation of an IWRM approach with an emphasis on sustainable development. It also encourages to establish operational data sharing at basin scale.

The SADC instruments for water cooperation include the Regional Water Policy, adopted in 2005; the Regional Water Strategy adopted in 2006 and Regional Strategic Action Plan on Integrated Water Resources and Development Management which was first approved by SADC Summit in August 1998 to run in five-year phases.

Institutional setup

Within the SADC Secretariat, responsibility for increasing and facilitating cooperation in Water lies with the Water Division, which falls under the Directorate for Infrastructure and Services. It is responsible for coordinating and facilitating[4] the implementation of regional water related activities in close collaboration with the member states of SADC under the guidance of the Revised Protocol on shared water resources (2000).

The SADC institutional setup also comprises specialized services and centres, including

- Climate Services Centre that disseminates meteorological, environmental and hydro-meteorological products. It is based in Gaborone, Botswana. It is currently setting up a Regional Climate Data Processing Centre, with 4 sub-components:
- Climate Data Management System (CLIDAM);
- Climate Data Processing and Production System (CLIDAP);
- Extreme Weather and Climate Monitoring (MONIS);
- Integrated Climate Information Dissemination and Early Warning System (IDIS);
- Regional Early Warning Centre.

[4] http://www.sadc.int/sadc-secretariat/directorates/office-deputy-executive-secretary-regional-integration/infrastructure-services/sadc-water-sector/

The SADC political organs include a SADC Council of Ministries for Water.

SADC-Water Division already carried projects in transboundary basins prior to the establishment of the basin organization. It may be relevant to bring it in the process of PuBuSa Project Preparation.

Joint Water Commission (JWC)

In application of the Article 2 of the SADC protocol[5] both countries have signed an agreement to establish a Joint Water Commission to address issues related to transboundary watercourses, meaning the Pungwe, Buzi and Save river basins. The JWC was established in December 2002. It is a non-permanent organ that meets annually and mobilize Ministers in charge of Water with their top-level advisors. The Commission advises the respective governments on the conservation, development and utilisation of their shared water and watercourses.

Basin-level management framework

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 exchange, 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.

Similar agreements are in preparation for the Buzi and Save basins. These agreements will pave the way for the establishment of a tri-basin river organisation.

The Monographs and their Joint integrated water resources management strategies and Action plans

River-basin scale diagnosis have been carried out for the 3 basins (2004 for the Pungwe basin, 2001 for the Buzi and Save basins), and translated into action through Joint integrated water resources management strategies and Action plans. These documents are still considered as reference documents by both countries in terms of basin knowledge, and basin planning.

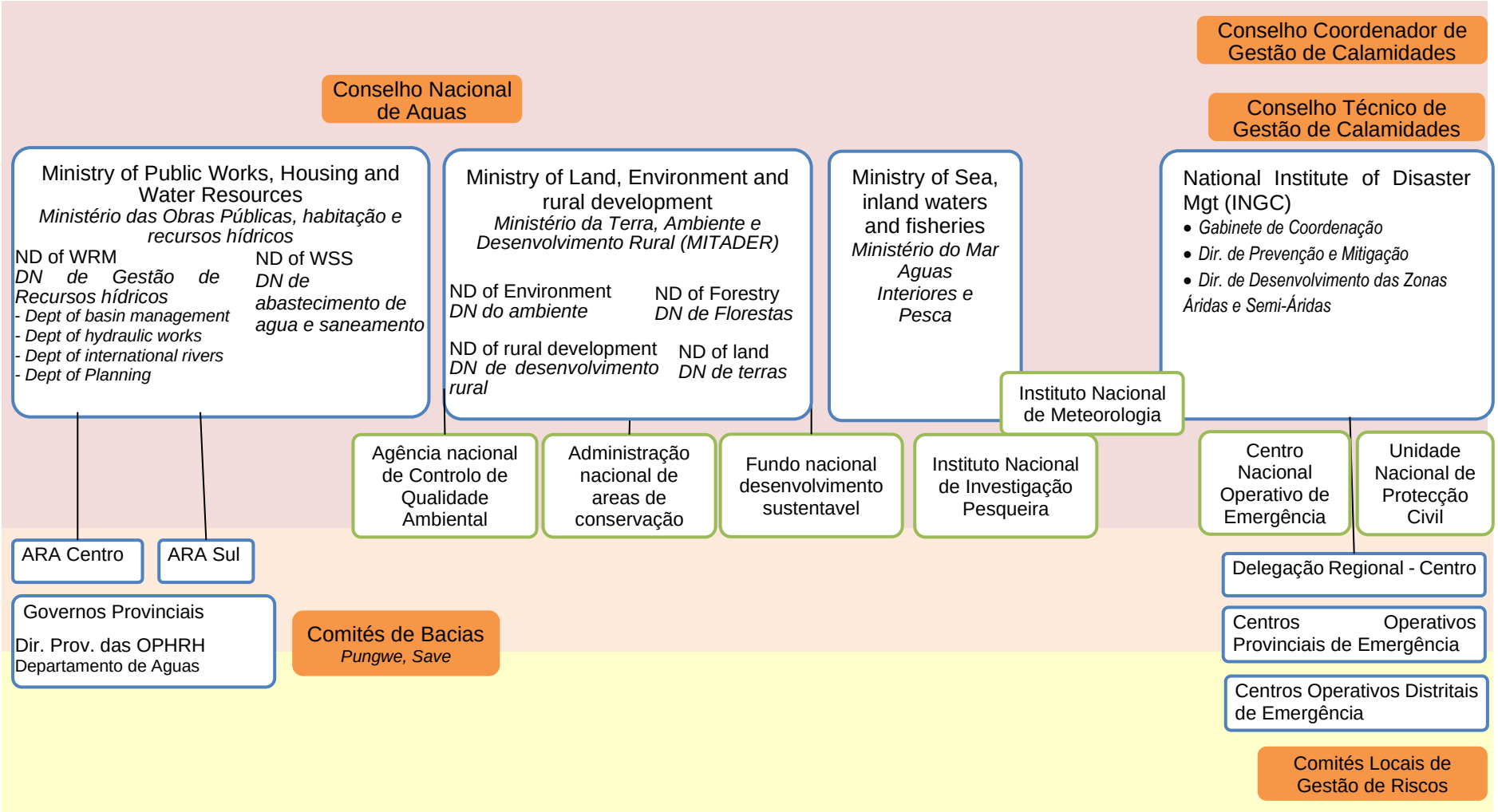
They comprise multi-dimensional assessments (water resource, water uses, water balance, environment, dams, socio-economic situation…) on which relies the development of an integrated diagnosis. The strategy proposes a development scenario.

3.4.3.**Mozambican governance framework**

The following diagrams depict the current institutional setup of institutions and organisation with a mandate regarding water resources management at national and local level in Mozambique.

[5] Article 2 of the protocol seeks to “promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses”

Figure 8: Simplified institutional landscape for Mozambican water resources and associated ecosystems management (excluding sectoral uses such as agriculture, industry, mines, hydropower…)



Source: BRLi

Water resources management

Regulatory and policy setup

The main instruments underpinning the water sector in Mozambique are the Water Law (1991) and the National Water Policy (1995).

The legal set-up is still essentially defined by the 1991 Water Law, with the exception of the Regulation of Licenses and Concessions of Water which was revised in 2007. The Water Law supports the main IWRM principles of catchment approach (unity and coherence in the management of river basins), stakeholder participation, and the economic value of water. Common uses (domestic purposes, cattle watering, small scale irrigation without mechanisation) are free and do not require license nor payment. Waters of private use need an authorization that can be given by law, licence or concession.

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. 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).

At local level, customary las and practices are applied by traditional authorities and chiefs.

In Mozambique, water resources management and environmental management are under separate sectoral ministries, although in Zimbabwe, the same ministry is in charge of both sectors.

Institutional setup

The **National Water Council** is an advisory body of the Council of Ministers on water related issues. It comprises a technical water committee. It provides advice on cross-sectoral coordination regarding water resources management.

At national level, the **Ministry of Public Works and Housing** (MOPH) and **its National Directorate of Water** (DNA) have a central role in the water resources management. DNA currently assumes the responsibilities at the national level for policy, planning, and sector oversight. It comprises in particular the following departments, which are of particular importance for IWRM:

- The **Department of Water Resources Management** is responsible for the inventory of water resources, the Master Plans for the river basins and technical and methodological guidance to the Regional Water Administrations (ARA).
- The recently established Office of Hydraulic Works (GOH) is responsible for the promotion, coordination and supervision of construction of hydraulic works and mobilising funding.
- The **International Rivers Office** has been created in recognition of the special importance of shared river basins for Mozambique. It is responsible for the liaison with the corresponding water affairs institutions in the other watercourse states and with the SADC Water Sector Division for the promotion and facilitation of cooperation on shared international water basins.

Operational water resources management relies on decentralised administrations Regional Water Agencies (ARA). **ARA-Centro** is responsible for the Pungwe, Buzi and Save basins, and smaller intermediate national basins. It was established in 1997. According to the legislation the ARAs are responsible for the implementation of IWRM at river basin level: planning, administration and control of public waters (including sanctions), licensing, approval and supervision of new hydraulic infrastructures, monitoring, water users' dispute resolution, definition of protection areas... They are responsible for the operational water management and to facilitate stakeholder participation. In that purpose, the ARA establish River Basin Management Units (RBMUs), which in turn establish River Basin Committees (RBCs) to ensure stakeholder representation in the decision-making processes (up to the consultation level). Currently, Save and Pungwe basin committees have been created. At regional level ARAs are instrumental for cross-sectoral coordination

Environmental management

Environmental management in Mozambique falls under the responsibility of the Ministry of Land, Environment and Rural Development (MITADER), that is comprises:

- Directorate of Land,
- Directorate of Environment,
- Directorate of Rural development
- Directorate of Forests,
- Inspections direction.

Among others, it also supervises the following parastatal organisations:

- National Agency for the Control of Environmental Quality
- National Administration for Conservation Areas
- National Fund for Sustainable Development.

Another Ministry has an important role in ecosystems management: the Ministry of Sea, inland waters and fisheries, also supervising the Fisheries Research Institute (IIP). This institutional setup has been created recently, but this Institute shall be in charge of ecosystems knowledge development, including mangroves and continental wetlands.

Climate change and adaptation

Due to its particular vulnerability to climate change, Mozambique has developed a National Strategy for Climate Change 2013-2028, with 3 main pillars: Adaptation, mitigation and crosscutting issue. The adaptation pillar chapter underlines the importance of strengthening the Climate early warning systems, in particular for disseminating information to end-user, having EWS downscaled to district level, and ensuring real time reaction The INGC role needs to be reinforced in that regard. Regarding Water resources management, priorities concern the increase of regulation capacity at basin scale, and develop the local storage, treatment, and distribution of water. The strategy also prioritises the regeneration, protection and sustainable use of mangroves for the triple purpose of having sustainable fish resources, protecting coastal areas, and conserving biodiversity.

Floods and droughts management

Legal and policy framework

The Buzi Community Early Warning System inspired the development of the Disaster Management Law in 2014, that precises and complements the institutional setup that it had experienced, providing a very operational system.

The first strategic axis of the Master Plan for Disaster Prevention is dedicated to water issues, both for floods and drought management. It underlines the need for water regulation (both for storage for drought mitigation and for flood control). Pungwe, Buzi and Save basins are highlighted as locations with severe flood risks, and the Masterplan prioritises the construction of the Bue Maria dam on the Pungwe basin, and the formulation of Masterplans for Pungwe and Buzi basins. Development and improvement of the Early warning system, flood risk mapping and the creation of local committees for disaster management.

Institutional setup

In Mozambique, institutions involved in natural disasters management are coordinated during crises by the **Coordination Council for Disaster Management**, gathering at the political level the key decision-makers involved in disaster management or potentially affected. It is supported by a **Technical Council for Disaster Management**. This coordination structure is duplicated at the Provincial level.

Due to the importance of this concern in Mozambique, a permanent technical structure has been created **National Disaster Management Institute (INGC)**, as an autonomous institution under the Ministry of Foreign Affairs and Cooperation. It manages day-to-day matters relating to disasters. In particular, it coordinates, with the ARAs, the establishment of flood warning systems and their operation during the floods, focusing on the dissemination of information to the population and affected institutions and in emergency prevention measures, during and after the floods.

The **National Meteorological Institute (INAM)**, autonomous institution under the ministry of transports and communications, is responsible for climate monitoring and meteorological forecasts.

Water uses

The water uses development lies under the corresponding line ministries and autonomous organisations, and in particular:

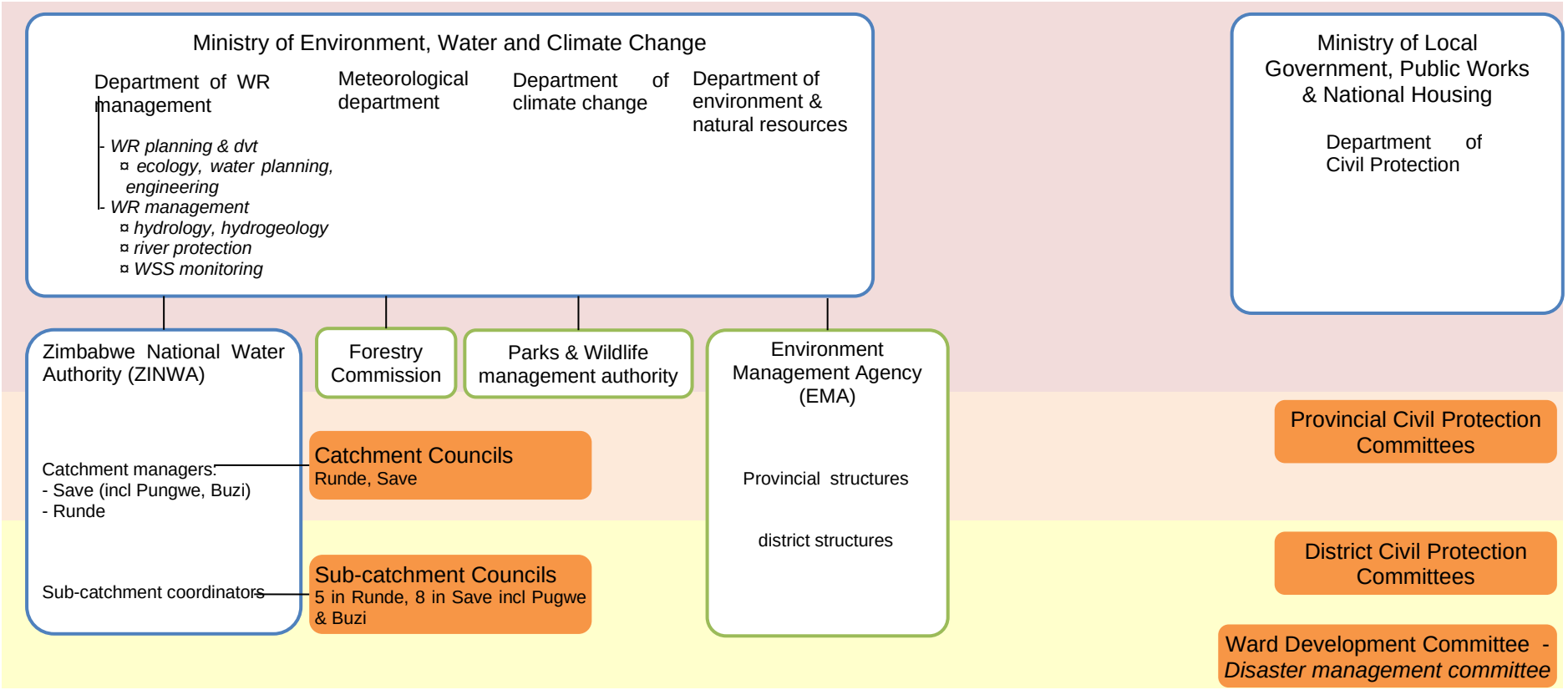
- In Mozambique,
  - the National Directorate[6] of Agrarian Services DNSA of the Ministry of Agriculture and Food Security (which comprises a department dealing with irrigation projects),
  - The Ministry of Industry and Commerce,
  - The ministry of Natural resources and Energy (National directorate of Mines),
  - Electricity of Mozambique

3.4.4. **Zimbabwean governance framework**

The following diagrams depict the current institutional setup of institutions and organisation with a mandate regarding water resources management at national and local level in Mozambique.

[6] which comprises a department dealing with irrigation projects

Figure 9: Simplified institutional landscape for Zimbabwean water resources and associated ecosystems management (excluding sectoral uses such as agriculture, industry, mines, hydropower…)



Source: BRLi

Water resources management

Legal and political documents

In Zimbabwe, the 1998 Water Act is the overarching law governing the water sector and is based on the principles of integrated water resources management. The Water Act introduced a number of new principles in the management of water resources, such as no private ownership, 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. The fundamental ingredient of the regulatory framework of Zimbabwe is the Polluter Pays Principle, which places the responsibility for pollution abatement and the costs of monitoring and management thereof on the polluter.

Zimbabwe's water policy is largely intrinsic to the Water Act. A few documents have given emphasis to various aspect of the Act. The **National Water Policy** of 2012 was largely drafted as a response to the collapse in water revenues and the precipitous decline in water supply and sanitation infrastructure and services, with also a priority given to pollution control. It therefore outlines two phases. The first is a recovery phase to arrest the continued deterioration by restoring the water sectors' institutional capacity and financial viability. The second is a 'normalised' phase based on a long-term economic growth. The policy document restates DWD's mandate which is encapsulated in the Water Act. Another document that alludes to water policy is ZimAsset – the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (2013 – 2018) – the government's blueprint for economic recovery. The Infrastructure and Utilities Cluster is one of the number of socio-economic groupings for planned development. This cluster includes water supply and sanitation infrastructure through the construction of dams and conveyance systems. In 2015, President Mugabe announced a '10 Point Plan' for sustained economic growth to complement ZimAsset, including the reduced cost of doing business through infrastructure development, such as the provision of clean water

ZINWA has a policy of making sufficient water available to its citizens, as well as to Mozambique in terms of its international agreement and obligations. Zimbabwe also, of course, has an obligation to meet the water requirements of its own users. Under Zimbabwe's Water Act and Environmental Management Act, water is made available for primary purposes and the needs of aquatic life and ecosystems. 5 per cent of mean annual runoff (MAR) is reserved for environmental flow.

At village level, customary las and practices are applied by traditional leaders and the Council of Elders.

Institutional setup

The **Ministry of Environment, Water and Climate** has wide responsibilities for managing the environment: from environment and natural resource management and integrated water resource management, to the provision of weather information and climate change management. Accordingly, it administers

- Several departments :
  - the Meteorological Services Department monitors weather and climate related risks and shares information with various stakeholders. MSD oversees a network of 50 synoptic weather stations, out of which 32 are automatic,
  - the department of Climate,
  - the Department of Water Resources,
  - the department of Environment

- several statutory organisations:
  - the Zimbabwe National Water Authority (ZINWA),
  - the Environmental Management Agency,
  - the Zimbabwe Parks and Wildlife Management Authority,
  - the Forestry Commission

The Ministry also has the mandate to coordinate multilateral and regional protocols and agreements.

The **Zimbabwe National Water Authority (ZINWA)** was established in terms of the Zimbabwe National Water Authority Act 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. For the purposes of the management of water resources, Zimbabwe is divided into seven administrative catchment areas based on hydrological boundaries. The Save basin is divided into 2 administrative catchment areas: Runde and Save. Being relatively small areas within Zimbabwe, the Pungwe and the Buzi Catchments fall under the Save Basin for administrative purposes. ZINWA has offices and staff dedicated to water resources management in each of the administrative catchment areas.

Each of these administrative areas has a **Catchment Council**, which is made of members from its sub-catchment councils. The **Save Catchment Council** consists of 14 members made up of representatives of the eight sub-catchment councils. The main functions of Catchment Councils are to prepare a Catchment Outline Plan for its area; determine and grant water use permits using criteria set by DWD; and to regulate the rights to and use of water.

Sub-catchment councils, which are established for each sub-basin of the Catchment Council, have their own offices and staff, and are empowered to collect fees and levies from water permit holders and users. This enable them to have a financial autonomy, as part of the fees collected are used for operating budget. They are composed of representatives of stakeholder groups in their area of jurisdiction. The **Buzi Sub-catchment Council**, for example, is composed of representatives of small scale farmers; communal farmers; large estates, such as Tanganda, the Forestry Commission, Wattle Co and Border Timbers; rural service centres; as well as representatives from the town of Chipinge. While its priority is to exploit the huge ground water resources, the Odzi Sub-catchment Council's primary goal is to curb pollution from gold panning, mines and the City of Mutare. However, Sub-catchment Councils face the difficulties of collecting fees, undertaking compliance monitoring, and catchment protection. Given the current policy ambivalence, they are unable to prevent unlawful discharge of effluents, illegal logging, and the environmental destruction caused by artisanal miners.

ZINWA appoints a **Catchment Manager** for each administrative catchment area, but which work under the direction of the Catchment Council. The Catchment Manager's office provides technical and secretarial services to the Catchment Councils and ensures that sufficient water is supplied to farmers, mines, towns, growth points and other communities. The Catchment Manager for the Save, with its office in Mutare, covers the Pungwe, Buzi and the Save catchment down to its confluence with Runde River. For analytical purposes the basin is divided into eight smaller hydrological units called subzones, which are usually categorised according to major confluences, dams or runoff station. Points of interests for measuring are major confluences, existing dams or planned dam sites, and flows at the border. The Catchment Manager for the Runde is responsible for the corresponding administrative area, and is based in Masvingo.

A significant feature of Zimbabwe's institutional setup is the notion that stakeholders should have a say in the management of the water resources on which they depend. It is one of the main building blocks of the concept of integrated water resources management in Zimbabwe.

The water users and stakeholders who sit on Catchment and Sub-catchment Councils have been granted powers to grant or revoke permits, collect fees, undertake compliance monitoring, as well as formulate catchment and sub-catchment plans. Hence, stakeholder involvement in Zimbabwe is extensive in terms of inclusiveness; fully institutionalised in terms of structures and procedures; and far-reaching in terms of powers.

Environmental management

Legal and policy documents

In Zimbabwe, water quality issues and wetlands protections are vested under the Environmental management act has specific sections regarding protection of wetlands

Like the Water Act, the Environmental Management Act lays out the Agency's policies for ensuring the sustainable management of natural resources and the protection of the environment; the prevention of pollution and environmental degradation; and the preparation of Environmental Plans for the management and protection of the environment. And, like the National Water Policy, it makes any person, who pollutes the environment or causes environmental damage, meet the costs of reparations and restoration. Special management and planning is devoted to sensitive, vulnerable and highly dynamic or stressed ecosystems, especially where they are subject to significant human resource usage and development pressure.

To measure water quality, monitoring points are strategically placed on Zimbabwe rivers to determine the effects of effluents on water quality. The results are then used to issue permits, which are classified into blue, green, yellow and red, depending on the environmental hazard (as shown in the table below).

The Environmental Management Agency has been granted considerable statutory powers of inspection and to impose penalties on any persons harming and polluting the environment, as well as making them pay for rehabilitating the environment. But such powers are impotent in the face of the government's policy divergent interests. On the one hand, the Ministry of Mines and the Reserve Bank of Zimbabwe are encouraging the illegal gold panning that is polluting the waterways and destroying the environment; while on the other, the Environmental Management Agency is trying to meet its mandate by enforcing the law, but with limited success.

Institutional setup

In Zimbabwe, the **Environmental Management Agency** is a statutory body under the MEWC, responsible for ensuring the sustainable management of natural resources and protection of the environment, the prevention of pollution and environmental degradation, the preparation of Environmental Plans for the management and protection of the environment. It was established under the Environmental Management Act and operationalised in 2003. It is in charge of planning, monitoring, environmental impact assessment instruction, licensing (mines, waste …) and ensuring compliance.

Floods and droughts management

Legal and policy documents

The legislative framework for disaster risk management in Zimbabwe is currently guided by the Civil Protection Act of 1989: it is predominantly focused on civil protection and emergency management, as opposed to a holistic approach to DRM. A draft DRM Bill has been under development since the early 2000s. A draft National DRM Strategy aligned to the Hyogo Framework for Action was finalized in 2012. The draft Strategy has three Strategic Objectives:

- To enhance disaster prevention and mitigation capacity

- To strengthen national preparedness and response capacity for disaster risk management.
- To enable affected communities to recover from disasters with strong linkages to sustainable development [CADRI, 2014].

Institutional setup

In Zimbabwe, flood and drought management falls under the **Department of Civil Protection**, under the Ministry of Local Government, Public Works and National Housing. At the decentralised levels, Civil Protection Committees have been created and trained in disaster-prone areas, as sub-groups of the District Councils and Ward Development Committees.

A **High Performance Computer Centre** has been established in 2014 at the University of Zimbabwe to support research. The Meteorological Services Department is using the high performance computers to run numerical weather models used for weather forecasting. The MSD

Climate change and adaptation

Zimbabwe's National Climate Change Response Strategy has seven cross-cutting pillars, and sector specific strategies, among which one concerns the Water Sector:

- Water Resources Availability Issues
  - Strengthen and intensify monitoring institutions for hydro-meteorological parameters.
  - Conduct more frequent yield assessments of surface and groundwater resources.
  - Promote water use efficiency in all sectors.
- Water Development Issues
  - Develop, rehabilitate, maintain and protect surface and groundwater resources.
  - Invest in management of effects of extreme events.
- Water Management Issues
  - Strengthen stakeholder structures in water resources management.
  - Promote more efficient water use practices.
  - Promote catchment protection.
  - Adopt data analysis and prediction tools that incorporate climate change.

Water uses

The water uses development lies under the corresponding line ministries and autonomous organisations, and among others:

- Ministry of Lands, Agriculture & Rural Resettlement (Mechanization and irrigation department)
- The Ministry of Industry and Commerce,
- The Ministry of Energy and Power Development

3.5. Stakeholder consultation

The project components design process, during the PPG mission, benefited from a large consultative approach. A reconnaissance mission, a scoping mission and a site-reconnaissance mission have been led successively in each of the four countries and were occasions to identify and meet potential partners for the project activities implementation. Regional, national and local stakeholders from the national institutions; the private sector and the civil society have been extensively consulted during these missions. All stakeholders provided the project preparation team with ideas, needs and expectations about the project, during the bilateral meetings, the two regional workshops and the field mission:

- An inception workshop in February 2018, enabling to start the discussions about the logical framework, the pilot sites and the cofinancing,
- **Two national meetings for discussing the pilot sites** (April 2018) **and a pilot site regional validation workshop**, held on May 2018, where the stakeholders held work sessions and came up with recommendations for the outcomes, outputs, activities of the two components of the project, as well as for the institutional set-up for the project management and coordination. Their recommendations have been fully incorporated in the following sections 4.3 and 5. The list of stakeholders met is attached in Appendix 11.
- **A field mission held on May and June 2018,** that enable to get an overview of the basins challenges, to visit the pilot sites and meet riverine populations, water users and decentralised administrations.
- **A final workshop**, held in July 2018, where representatives of the proposed executing agencies and the GEF national focal points reviewed and amended the core contents of the draft Project Document: the logical framework, list of activities and institutional setup. Their recommendations have been incorporated. The Minutes of the meeting are presented in Appendix 12.

3.6. Baseline analysis and gaps

The governments of Mozambique and Zimbabwe and SADC have established national and regional policy agendas that integrate transboundary water resource management, institutional development, and capacity building development. The international community has provided support to national and local stakeholders to advance this agenda through a series of transboundary projects targeting different sectors and geographic areas.

The section below provides a summary of past, current and planned projects that have been, are being or will be implemented to address the environmental problems this project will address. Taking into consideration previous projects and close coordination with present and future projects will be crucial to make sure the present project capitalizes on results achieved and maximizes impacts by taking advantage of synergies with existing and planned projects.

3.6.1. Past and on-going national and regional actions and projects related to planning, institutional and legal aspects of transboundary IWRM

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

The strategy developed through the Sweden financed "Pungwe Program" enabled the **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.

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.

Gap analysis: The two latter projects provided a strong contribution to the existing baseline. They enabled the production of technical data and information, the drafting of Monographs and the development of IWRM strategies, including the prioritization of key water development projects, in the 3 shared river basins of interest. The GEF project will build directly on these diagnostic and planning documents to update and integrated them into a Transboundary Diagnostic Analysis and a Strategic Action Plan at transboundary level.

The Pungwe Program PP1 and PP2 (Swedish International Development Cooperation Agency – SIDA, 2001-2012)

The Pungwe Basin Trans-boundary IWRM Program represents an endeavour 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 Program'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 program worked on three main components:

- Protection of the environment: To restore the integrity of the Pungwe River and to minimize 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 shared river 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 Program 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.

Table 4: Pungwe Programme's major achievements

	Results and tools developed	**Outcomes**
Institutional capacity and technical tools	Upgrade of the hydrometric network of the Buzi and Save: review of the current network, recommendation of new network, procurement and installation of equipment. Data collected but not uploaded nor treated. No software license; Flood forecasting preparation for 2015/2016. Flood forecasting and drought management: daily hydrological bulletins (December to April) and quarterly water quality reports produced and disseminated to water users. Pre- and Post- rain season meetings have been organized during the lifespan of PP2, but are now discontinued; The hydrological model "Geospatial Stream Flow Model" was developed for Pungwe, Buzi and Save. Uncertainties remain regarding its actual operationality for the 3 basins. Some calibrations remain to be undertaken. This model builds on the Buzi hydrologic model (HEC HMS), the Save hydrologic model (HEC-RAS), among others (Mike) and on the existing allocation models (WEAP and PITMAN for the three basins). Existing models may not be currently used due to license issues; Facilitation of internal management instruments for ARA-Centro; Support to operationalization of the Buzi basin management units; Support to operationalization of the Pungwe basin management units; Staff training and capacity building.	More effective contributions towards water resource management by stakeholders following capacity building to the Pungwe Basin Committee (PBC), Pungwe Sub Catchment Council (PSCC) Nhazonia and Gorongosa sub basins; Better-informed water users following dissemination of water resources bulletins/reports produced by ARA Centro and ZINWA Save. Improved contributions to decision making on water resources management; Better service delivery of ARA Centro and ZINWA Save staff; Increased awareness of upstream-downstream water resources management challenges; Improved revenue collection systems after installation of the new billing, accounting software, training and the provision of transport facilities; Reduction in loss of lives as a result of provision of timely warnings ensuing the installation of real time data loggers and various flood forecasting training programmes of ARA Centro and ZINWA Save staff; Improved coordination and exchange of information among key departments involved in Flood Management through the bi-annual Post and Pre seasonal meetings held between the two countries.

Regional cooperation	Bilateral Agreement, including water sharing, for the Pungwe Basin signed and ratified BUPUSA tri-basin institution not established; Negotiation on Water Sharing of the Buzi not completed. Draft TORs for the BUPUSA forum were produced by the GoM and GoZ, in consultations with stakeholders from Pungwe, Buzi and Save River Basins. The ToRs await final approval by the two governments; Draft annexes for the Save Basin (which contains detailed information on the water resources of the Save river basin, baseline information on water quality and transboundary allocation scenarios) was produced and presented to member countries. The annexes will be used when negotiations on sharing the Save Basin commence; Multidisciplinary environmental flows training, through a collaborative effort between the IUCN and PP2;	Formalized cooperation between Mozambique and Zimbabwe sharing, in the development and management of Pungwe River Basin water resources following the signing of the Pungwe Agreement; Increased regional Cooperation between the two governments in the management of water resources (through the JWC), already commencing negotiations on water sharing on the Buzi and Save River basins; Increased mutual trust and confidence among Senior Officials following the Buzi and Save Basin tour in preparation for negotiations for the water sharing agreements; Enhanced capacity for determination of environmental flows considerations in transboundary water allocation following hands on training held for ARA Centro, ZINWA Save and key institutions responsible for environmental flows; Enhanced exchange of information through PMC, post and pre seasonal meetings held between ARA Centro, ZINWA Save and key organizations involved in flood management The countries are now able to inform each other earlier in the event of floods. The disaster management agencies are therefore able to alert the public in advance.
Poverty Reduction	Feasibility studies for water supply and irrigation in the 2 countries with capacity building of local stakeholders and resource mobilization for some dams	
Environmental Protection	Dissemination of gold panning strategy of the Pungwe River Promotion of Sustainable Technologies for Gold Panning Support to panning Association Cooperatives/groups Finalizations of MoUs, Constitutions and Commissioning of Gold panning projects Promotion of catchment conservation Enhanced Water Quality Monitoring. Water quality assessment campaigns were carried out but discontinued after the end of the project. Support to Operationalization of the Joint Water quality monitoring network	

The Pungwe program is now closed and will not be further extended.

The Pungwe River Basin Agreement (2016)

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 utilization 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 exchange 20, 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.

Gap analysis: The Pungwe Program PP1 and PP2 had a significant contribution to transboundary cooperation in the Pungwe basin, for both technical and institutional aspects of IWRM development. However, several technical tools or institutional outcomes remain to be finalized and/or implemented, such as the setting-up of a sustainable tri-basin institution - the daily operation of the JWC without donor funding is questionable - or the definition of e-flows and allocation rules. The SADC/GIZ transboundary water management project (see below) has taken-up the opportunity of further developing the institutional framework. Technical support to extend the PP2 IWRM approach to the Buzi and Save basins and to further continue the technical outputs (hydro-meteorological and water quality monitoring, allocation model development, e-flows definition) is however necessary.

Transboundary Water Management in SADC (BMZ/DFID, GIZ/SADC, 350 kUSD, 2016-2019)

The BMZ/DFID funded project, implemented by GIZ and SADC Secretariat, and executed by the Global Water Partnership – Southern Africa, focuses on strengthening institutions and promoting water cooperation to become the engine for regional integration and development. The program aims to improve the implementation of selected, harmonized strategies and policies on transboundary water cooperation in the region. Activities of the program, designed to implement a multi-level approach (regional - SADC, basin – River Basin Organizations, and national –Member States), consist in the strengthening of River Basin Organizations:

- the program will be facilitating water sharing agreements for Buzi and Save River Basin :
- Mozambique and Zimbabwe National Internal Consultation Meetings on Buzi Water Sharing Agreement;
- Buzi Water sharing Agreement Negotiation Team Meetings;
- Joint Water Commission Meeting to endorse the Buzi Water Sharing Agreement;
- Save Technical Review Meeting to finalize technical aspects of the Save Water Sharing Agreement;
- Internal national review and consultation meeting on the Save Water Sharing Agreement;
- Meeting to update the Zero Draft Save Agreement;
- the program will also be supporting the establishment of the BUPUSA Tri-Basin Institution :
- Preparation of a Road Map for the Establishment of the BUPUSA Tri-Basin Institution and its financing and sustainability strategy;

- Technical Advisory Committee Meetings on the Road Map for the Establishment of the Bilateral Institution;
- Joint Water Commission Meetings on the Road Map for the Establishment of the Bilateral Institution.

Gap analysis: This project aims at covering the gaps in terms of institutional development and strengthening at the scale of the three basins, without any technical activities. This strategy therefore needs to be complemented by a more technical support to generate data and information about the hydro-meteorology and the ecosystems in the basins, in order, in the end, to improve water resources management and risk reduction practices. This is a very interesting window of opportunity for the IUCN/GEF project.

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 ended in March 2019, 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 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

The IUCN support to assist in the development of capacity to assess and manage environmental flows is of high interest to the present project, since the lack of this capacity had been identified as a major constraint to improve the transboundary managements of their shared water resources. The IUCN partnered with Waternet, a SADC subsidiary institution mandated to develop capacity on integrated water resources management in this region. Waternet delivered in 2015 and 2016 two modules to participants responsible for planning and managing the shared river basins in Mozambique and Zimbabwe:

- Module 1: Principles of Environmental Flows
- Module 2: Environmental flows - from Theory to practice

Module 3 - Determination of environmental flows for basin planning was organized between September and December 2018. Its outcomes were:

- Understanding of the practical aspects of the e-flow determination;
- Improvement in basin management;
- Improvement in planning at basin level (including trans-boundary);

- Skills in negotiating water allocation to reduce/avert conflicts at basin level;
- Increased appreciation of different users;
- Basin managers able to work across national boundary – i.e. at the ecosystem/basin level.

It consisted of field and analytical work in ecology, hydrology, geomorphology, groundwater, socio-economy, including data collection, to derive environmental flow requirements using responses of different ecological and socioeconomic elements to river flow modifications in some pilot sites,

Gap analysis: Mixing institutional support and capacity building about technical issues, the BRIDGE initiative in the three basins has ended. . The capacity building and cooperation activities about e-flows definition and management constitute a strong basis to further the e-flows definition in specific key sites in the basins.

Coastal Resilience to Climate Change (CRCC) (IUCN/SIDA; 1million UDS; 2017-2020)

The Coastal Resilience to Climate Change is a four years initiative that aims to strengthen and restore the value of coastal and marine ecosystem goods and services to improve social, economic and ecological resilience to climate change. It is focused on enhancing the adaptive capacities of men and women from coastal communities, local and national authorities to work together to sustainably govern and manage their natural resource base. The overarching principle goal of CRCC is to "*Strengthen and restore the value of coastal and marine ecosystem goods and services to improve social, economic and ecological resilience to climate change*". Operationally, CRCC will contribute to this Goal through the realisation of its Programme Purpose, which is to: "*Enhance the adaptive capacities of men and women from local coastal communities, local and national authorities to work together to sustainably govern and manage their natural resource base*".

The Programme is designed to deliver against four main outcomes:

- **Community social resilience** – Coastal community social systems are better able to cope with the impacts and shocks of climate change by self-organizing and engaging in equitable and gender responsive governance and management of their natural resource-base, and practicing active local-level learning and adaptation based on experiences and new knowledge
- **Economic resilience:** local coastal community economics are strengthened and able to minimize or reduce welfare losses due to climate change stressors, shocks and disasters through improvements in and diversification of livelihoods [of women and men]; increases in fisheries and agricultural efficiencies; and specific, nature-based market interventions driven by value chain analyses.
- **Ecological resilience** – The integrity and ecological health of coastal and marine ecosystems and habitats is improved and/or maintained to enable social-ecological systems to better absorb and withstand climate change stressors and shocks.
- **Institutional strengthening** – Institutional frameworks, including policies/legislation as well as local organizational capacities, strengthened to better enable and support evidence-based decision making, adaptation action and ensure social and ecological resilience of marine and coastal systems.

These outcomes are to be delivered through the following operational results:

- Programme partners and stakeholders mobilized, trained and working together to effectively deliver the Programme;

- Community and District constituencies established to enable effective engagement in improving coastal resilience through sustainable and inclusive land and sea resource use using ecosystem and rights based approaches;
- Community resilience strengthening actions carried out in an inclusive and participatory manner involving men and women and resulting in tangible benefits and positive changes in governance, natural resource management and local level livelihoods;
- Policies, regulatory frameworks and governmental organizations at national, provincial and district level better enabling and supporting coastal community resilience action;
- Innovative conservation finance mechanisms established to ensure longer term investments in and sustainability of resilience and adaptation action.

Gap analysis: The approach focuses on resilience through community empowerment and institution building. The project's central objective lays a strong foundation for community participation in climate disaster mitigation which can be complemented by more technical support that the IUCN/GEF Project will bring.

Enhancing coastal and marine socio-ecological resilience and biodiversity conservation in the Western Indian Ocean (IUCN) 2019 - 2023

The project addresses the high level of vulnerability of ecosystems and livelihoods using a "resilience framework" that integrates four components: (i) Ecological and Social Diversity, (ii) Innovative and sustainable infrastructure and technology, (iii) Equitable and resilient governance systems, and (iv) Data and information for adaptive management. It aims to reduce the vulnerability of selected coastal areas facing crucial sustainability issues, and improve marine protected areas as ecosystem-based mitigation and adaptation. Applying a mix of tools & approaches to enable key conservation functions, sustainable management of ecosystems, adaptation to climate change, and increase capacity to manage natural resources communally are the core issues of biodiversity/marine conservation and policy change. With funding from the BMU – IKI for half a million dollars for the Mozambique case; the overall goal of the project is "to strengthen the resilience of coastal socio-ecological systems in the Western Indian Ocean region", by engaging in 4 focal areas:

- Strengthen adaptive capacities of local communities dependent on coastal and marine resources;
- Enhance resilience of critical coastal ecosystems and habitats;
- Influence coastal economic development to be more environmentally sustainable and socially equitable;
- Effectiveness of local governance in managing and influencing coastal ecological and social systems improved.

Gap analysis: The project also promotes community empowerment on climate resilience, that can be enhanced by technical support for drought and flood early warning systems. The organisation of the communities into competent local level governing bodies will bring considerable efficiency to the implementation of the GEF funds.

Building River Dialogue and Governance Phase 4 (IUCN)

IUCN recently secured funding for a Phase 4 of BRIDGE. Its main outcome in the PuBuSa basin will be that enhanced water governance capacity for transboundary cooperation in Pungwe/Buzi/Save basins translates to action planning around concrete transboundary water management issues. Operationally, it will:

- Strengthen legal and policy provisions for joint conservation and valuation of shared natural water infrastructure/assets to enhance information on benefits of E-flows management and basin financial sustainability in PuBuSa, through:
    - Review of legal and policy frameworks and development of recommendations and guidelines for incorporation of joint conservation and valuation of shared natural water infrastructure/assets in national policies and PuBuSa transboundary agreements.

      Stakeholder consultations revealed the need to quantify and measure (value) e-flows benefits in addition to their assessment and determination, which was achieved through BRIDGE 3. However, the extent to which current institutional frameworks in both countries can accommodate ecosystem valuation is not clear. Therefore, an institutional assessment of legal provisions facilitating ecosystem valuation to enhance the governance of shared waters will help to reveal any gaps and opportunities for relevant input. This is relevant as a first step to determine how much (ecosystem valuation) can be implemented under current legal framework and how much will be impeded.

      The review will create an opportunity to identify institutional areas at national in need of further strengthening. Further, this also creates a window for the harmonisation of the legal frameworks at basin level.
    - Organise basin multi-stakeholder policy dialogues to discuss and adopt the reviews and recommendations

      Work carried out in the previous activity will be validated by key stakeholders, especially those who have the mandate to implement policy. This is relevant for both the understanding and the ownership of recommendations produced. Stakeholders to participate at this workshop include government officials, basin authorities and representatives of basin communities. Once adopted, key stakeholders can be depended upon to move forward the agenda of the implementation of the recommendations.
- Enhance capacity to value shared natural water infrastructure/assets and ecosystems services in the Pungwe/Buzi/Save basins
    - Identify technical capacity gaps towards ecosystems valuation and in the basin

      This activity is a first and necessary step to enhancing capacity to value shared ecosystems. Key stakeholders in PuBuSa identified ecosystem valuation as a priority area requiring capacity development. The capacity development is earmarked for personnel at the operational level in charge of resource protection in each country. This activity will therefore ascertain the specific technical skills and personnel that can benefit from capacity building.
    - Based on previous activity, undertake two basin training of trainers workshops focusing on (i) General appreciation and rationale for natural water assets valuation (basin finance, conservation, benefit sharing etc.), and (ii) Hands-on training on natural assets valuation methodologies based on IUCN tools and resources, data requirements and responsible institutions

      The training workshops are necessary to address skills shortages. Subsequent to e-flows initiatives implemented by BRIDGE 3 in PuBuSa, stakeholders expressed the need for capacity on identifying, quantifying and measuring benefits of e-flows, hence the focus on valuation of ecosystems services and natural water assets as well as economic accounting for water. Natural asset valuation link to the new thematic focus on financial sustainability of institutions for water management in basins. This is important in connecting the technical elements of conservation to basin governance.

The desired impact is the safeguarding of natural water infrastructure of the basin and sustainable environmental management of water in the basin.

- Implement natural water assets valuation Pilot demonstration in the Buzi Basin

  Further to addressing the capacity needs, a demonstration will be useful to (1) test acquired skills of the trainees and to (2) proof the chosen methodology in a practical setting. The Buzi Basin was used as a pilot site for EF assessment in BRIDGE 3. As such, it will provide a convenient case.

- Based on previous activity develop Conservation Fund Model (CFM) for joint conservation of the Basin

  A conservation fund is envisaged to pool resources and sustainably fund basin conservation beyond the life of the BRIDGE programme. The fund can pool financial resources from the licencing of consumptive ecosystem benefits like fishing, hunting, aqua-sports and water use, as well as donor financing from interest organisations. The Fund can then finance partners who are keen to pursue their identified conservation priorities including small green business financing, conservation training and green infrastructure planning. While the exact model of this fund will be developed through a consultative process, its implementation is expected to involve community and government leaders, businesses, landowners and conservation NGOs to create innovative solutions that integrate economic and environmental objectives. A tailored CFM, built with key stakeholder inputs, is critical in PUBUSA. Through a successful model, basin conservation is achievable.

- Convene a basin workshop to share natural water assets valuation lessons from PuBuSa and developed CFM

  The important lessons learnt in preceding activities will be shared with multi-stakeholders to understand the basin's ecosystem value and initiate a discussion on the next steps for basin conservation. This is envisaged to be a four days' workshop targeting decision makers (Day 1), multi-stakeholders (Day 2) and technocrats (Day 3 – 4). This activity is expected to create a broader understanding of the value of ecosystems to promote water security among participants and initiate a new way of practise in implementing basin conservation.

- Enhance capacity to protect and preserve ecosystems in Pungwe/Buzi/Save basins

  - Convene a basin multi-stakeholder workshop to identify actions required for transboundary watershed protection and conservation

    Addressing conservation challenges requires a holistic approach that considers land use practices and waste disposal in the entire basin. Participatory approaches to galvanise action for basin conservation will be identified through such stakeholder consultations.

- Facilitate resource mobilisation for joint basin protection and generating data for economic accounts in Pungwe/Buzi/Save basins

  - Develop a proposal to secure funding for (i) transboundary watershed protection in PuBuSa to enhance recommended e-flows, safeguard water quality in the basin and minimise source to sea pollution downstream; and (ii) facilitate implementation of CFM developed.

    The conservation of the transboundary watershed appeared as a priority action during consultations in BRIDGE 3, especially the preservation of e-flows to ensure effective basin governance. E-flows strongly feature in both legal and policy requirements of water resources management at basin, national and regional levels (e.g. Pungwe agreement, IWRM plans, national legal frameworks and SADC protocol). Complying with e-flow requirements as part of basin conservation demands resources – which can be efficiently raised through funding proposals. A sustainable funding mechanism will ensure successful basin conservation.

- Incorporate the assessment of e-flows in regional academic and professional curricula
    - Introduce governance aspects of e-flows based on lessons from BRIDGE in IWRM learning material (short, professional courses and postgraduate academic qualifications) and BRIDGE Diploma on Transboundary Water Governance.

The important work on BRIDGE e-flows in this basin demonstrated the practical, technical elements of water cooperation. E-flows are part of basin treaties and regional water cooperation frameworks in southern Africa. Implementation of e-flows in basin cooperation has been a huge challenge until BRIDGE demonstrated approaches in PUBUSA. Using this knowledge to strengthen the skills base for e-flows implementation in the region is important to build sustainable capacity. Introducing the BRIDGE Diploma on Transboundary Water Governance, will grow the region's technical capacity and enhance the implementation of aspects of e-flows in transboundary cooperation.

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 (2014-2019). The project is financed by the World Bank through a US$8.2 million grant from the Global Environment Facility (GEF), and US$2.0 million from the multi-donor trust fund, Cooperation on International Waters in Africa (CIWA).

The project plans to implement priority actions in the work-program 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 expected results are: (i) Development of the SADC Groundwater Management Institute into a regionally recognized centre 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 has 4 components. (1) Operationalizing the SADC Groundwater Management Institute (GMI) component will ensure the coordination and administration of the SADC GMI during project implementation. (2) Strengthening institutional capacity for the sustainable management of groundwater in SADC component will finance legal, policy and regulatory frameworks which will address prevailing gaps in institutional groundwater management tools at national and transboundary levels. (3) Advancing knowledge on transboundary and national groundwater component will finance the support to Transboundary Aquifer Management in Member States and in collaboration with relevant government authorities and River Basin Organizations (RBOs) in finding solutions to shared groundwater challenges through Transboundary Diagnostic Analysis (TDA) and Strategic Action Plans (SAP) alongside mechanisms for data collection and sharing. (4) Promoting groundwater infrastructure management and development component will promote the role of infrastructure as a means to develop opportunities for more sustainable management of groundwater and addressing growing challenges related to issues such as drought, recharge, pollution, conjunctive land-water management, water and food security, climate change etc. in 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.**

Gap analysis: The approach focuses on institutional development, capacity strengthening and planning document drafting for improved management of transboundary groundwater resources. Being supported by GEF funds, the promoted tools for international waters management (TDA, SAP, etc.) will be similar to the present project. There is no technical activity that would generate data and knowledge about groundwater resources or contribute to strengthening the monitoring network.

Transboundary Water Resources Management Programme for Africa (GRID-Arendal)

Under the Transboundary Water Programme, GRID-Arendal seeks to use information products to foster regional peace building and integration efforts, given the competition associated with shared resources. The overall goal of GRID-Arendal is to strengthen transboundary cooperation and build a sound dialogue among the countries' academia, civil society, youth, government and other stakeholders. Through communication products and services, GRID-Arendal aims to ensure that countries reap the benefits of cooperation on shared water resources through assessments on the status of the environment. The assessments include print and online publications, capacity building, and information outreach.

Through the Transboundary Water Programme, GRID-Arendal has carried out assessments leading to the publication of Atlases for Lake Victoria Basin, Zambezi River Basin and the Limpopo Basin. A payment for ecosystem services study was also carried out for the Okavango River Basin. The programme has interest in working on all the 64 shared river and lake basins in Africa, including the Pungwe, Buzi and Save River Basins.

As part of its approach, GRID-Arendal works with partners that include river basin commissions, providing not only matching funds but also expert input through cartographic services, data processing and visualisation.

Gap analysis: The Transboundary Water Programme is part of the long-term programmes for GRID-Arendal, with an annual budget of NOK 1 million. The methodologies applied in the assessment work of GRID-Arendal are internationally accepted, and these include integrated environmental assessment that apply the Drivers-Pressure-State-Impact-Response framework, and the expert elicitation methodology. Capacity building and training are part of the efforts by GRID-Arendal.

3.6.2. Past and on-going national and regional actions and projects related to flood and drought management

Community based flood early-warning (BMZ-DFID, GIZ/SADC, 90 kUSD, 2016-2019)

With the financial support of BMZ and DFID and the technical support of GIZ and SADC, the Mozambican government implements pilot projects in the Lower Limpopo area and in the Buzi basin aiming at establishing a comprehensive flood forecasting and early warning system. The specificity of the initiative is the involvement of stakeholders and relevant partners at all intervention levels throughout the process in order to build an integrated, inclusive and sustainable early warning system. This disaster preparedness and climate resilience approach includes the following activities:

- Strengthening the hydro meteorological monitoring network;
- Development of communication procedures;
- Establishment of local committees.

Gap analysis: The tangible results obtained through this approach[7] argue for its replication to the other flood-prone basins in Mozambique and Zimbabwe, and especially in the shared Pungwe and Save basins.

Enhancing Spatial Data for Flood Risk Management Project (World Bank; 3.9 million USD, 2014-2017)

The objective of the project was to increase the capacity of Mozambique to prepare for and manage flood events in the Limpopo river basin. The project will support: the acquisition of high resolution spatial and topographic data through airborne Lidar (light detection and ranging) and orthophoto surveys; the subsequent production of digital elevation models; derivative information products such as land cover/use classification maps and break lines; the incorporation of those products into hydrologic models, hydraulic models, and decision support systems; and the application of those models to flood and natural disaster risk management.

Gap analysis: These activities were focused on the Limpopo river basin. Lessons learnt and developed tools could be replicated in the Pungwe, Save and Buzi basins.

Capacity for Disaster Reduction Initiative (CADRI initiative) in Zimbabwe and United Nations Disaster Risk Reduction actions in Mozambique

The Capacity for Disaster Reduction Initiative (CADRI) is a global partnership composed of 15 UN and non-UN organizations that works towards strengthening countries' capacities to prevent, manage and recover from the impact of disasters. The CADRI Partnership draws upon the diversity of expertise of its members to offers a unique combination of knowledge, experience and resources to support countries implement the Sendai Framework for Disaster Risk Reduction.2017-(…).

In **Zimbabwe**, **a capacity assessment of the disaster risk management (DRM) system** was conducted with a focus on national and sub-national capacities for DRM using the CADRI Capacity Assessment and Planning Tool for Disaster Risk Management developed by the CADRI partner agencies. The Tool supports the assessment of existing capacities of the disaster risk management system in line with the priority areas of the Sendai Framework for Disaster Risk Reduction (2015-2030). The assessment involved a large panel of stakeholders: Department of Civil Protection (DCP), UN agencies from Zimbabwe and international experts deployed through the Capacity for Disaster Reduction Initiative (CADRI) and the United Nations Disaster Assessment and Coordination (UNDAC) system. The assessment comprised interviews with approximately 100 Government and non-Government institutions at central and local levels in 4 districts (Chiredzi and Mwenezi; Bulilima and Tsholotsho). The assessment findings and recommendations have been structured into four priority areas: (1) understanding disaster risk, (2) strengthening governance to manage disaster risk, (3) Investing in economic, social, cultural, and environmental resilience, and (4) Enhancing preparedness for effective response, and building back better in recovery and reconstruction.

The CADRI initiative has now no further activity in Zimbabwe and is not involved in Mozambique

[7] They also inspired the institutional framework settled in the 2014 Law on natural disaster management in Mozambique

In **Mozambique**, GIZ/BMZ support the National Directorate for Water Affairs and Ara-Centro to develop national framework conditions and actions within the Buzi catchment to adapt to the impacts of climate change (Adapting to climate change in Mozambique). The approach capitalizes on the former GTZ project on Disaster Risks and Flood Management (2005). United Nations agencies (UNDP, WFP, etc.) also support the government in procuring flood early warning kits to the benefit of the vulnerable local communities (USD 30 kUSD for the three basins), in developing a national risk assessment map (prioritized risks are floods and cyclones) and in conducting risk assessment studies in the Limpopo basin and in the Zambezi Province. Promoted actions are anchored with the 5-year government plan for disaster risk management (2015-2020) – steered by the Technical council for Disaster Management (CTGC) and implemented by the National Institute for Disaster Management. This plan does not focus in the three basins of interest to the IUCN/GEF project.

Gap analysis: The capacity assessment of the disaster risk management allowed to prioritize action areas. The IUCN/GEF project shall build on these findings and recommendations, and especially on pillar 1 “Understanding disaster risk”. Consolidating risk data and information, mapping, and capacity building are indeed recommended and shall be the focus of the dedicated component of the IUCN/GEF project.

The Africa Hydromet Program and the “Climate Resilience: Transforming Hydro-Meteorological Services” project in Mozambique

The Africa Hydromet Program supports two projects in **Mozambique** to promote economic development. One program supported the preparation and implementation of the Enhancing Spatial Data for Flood Risk Management Project, along with GFDRR and partners. This project, detailed just above, closed in 2017.

The “Climate Resilience: Transforming Hydro-Meteorological Services” project (21 million USD, 2013-2018), also supported by GFDRR, delivers hydrological and meteorological information services to communities and businesses at risk. The Pilot Program for Climate Resilience (PPCR), from the Climate Investment Funds (CIF), finance the latter project. The project objective is to strengthen hydrological and meteorological information services to deliver reliable and timely climate information to local communities and to support economic development. The project will consist in investments in optimised hydro-met monitoring networks, more effective management and exchange of hydro-met data; and improving the capacity to forecast future water and weather conditions. As a result, transformed hydro-met services will support more robust early warning systems and relevant, accurate and timely hydro-met information. It relies on the following components:

- Component A: Strengthening Hydrological Information Management
- Component B: Strengthening Weather and Climate Information Management
- Component C: Piloting resilience through delivery of improved weather and water information

Gap analysis: The equipment, tools and procedures to strengthen weather, climate and hydrological data collection and processing for decision support, which will be developed through this project, as well as training and capacity building of the beneficiary staff (Directorate of Water, Regional Water Authorities, etc.) shall be further expended in the both national parts of the three basins of interest of the present project.

3.6.3. Past and on-going, national and regional actions and projects related to ecosystem based natural resource management and livelihoods climate resilience

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

Climate Resilient Infrastructure Development Facility (CRIDF)

CRIDF is a water infrastructure program 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 program 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.

CRIDF currently implements the following projects:

- Community-based development projects (CBDP), £ 1.2 million closing in 2018, supporting livelihood development (irrigation schemes, water supply systems, river protection from siltation through soil erosion reduction);
- Dams coordinated operations rules, £ 2 million closing in 2018;
- Border cities water supply – Mutare, £ 2 million closing in 2018;

Gap analysis: These projects led to the development of monthly-time-step hydrological model of in the Save Buzi basins, the definition of a sustainable water allocation strategy for the two basins, as well as, dam operating rules and establishment of new gauging stations after the Runde/Save confluence. These IWRM tools shall incorporate updated rules taking into account e-flows requirements to be developed by the present project to update water allocation rules. The complementarity with the IUCN/GEF project is therefore very strong. Despite the depicted projects are coming to an end by the end of 2018, CRIDF shall initiate fund raising activities and support the implementation of the prioritized infrastructure in 2019 and 2020. CRIDF initiative is therefore a strong co-financing candidate to the present project.

Building climate resilience of vulnerable agricultural livelihoods in Southern Zimbabwe (GCF/UNDP USD 33.4 million, 2019-2025)

The GCF project proposal "Building climate resilience of vulnerable agricultural livelihoods in Southern Zimbabwe" has been developed by UNDP with the Government of Zimbabwe, in cooperation with the Climate Resilience Infrastructure Development Facility

The objective of this project is to strengthen the capacities of smallholder farmers in southern Zimbabwe, especially women, to adapt to the impacts of climate change-induced water scarcity on their agricultural livelihoods. The expected outcome of the project is increased resilience in terms of health and well-being, and food and water security. To achieve these outcomes the project proposes to overcome the above identified barriers through implementation of the following three interlinked outputs, using GCF and co-financing resources:

- Increased access to water for climate-resilient agriculture through climate-resilient irrigation systems and efficient water resource management;
- Scaled up climate-resilient agricultural production and diversification through increased access to climate-resilient inputs, practices, and markets, and;
- Increased access to weather, climate and hydrological information for climate-resilient agriculture.

Gap analysis: Strengthening the resilience of livelihoods and income generating activities highly contribute to disaster preparedness and vulnerability reduction. The anticipated results of this project are therefore valuable and complementary to the IUCN/GEF project, whose approach focuses on risk reduction.

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. The initiative 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 program 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 management 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 program 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.

Gap analysis: The SUSTAIN initiative provides a baseline in terms of climate-resilient water infrastructure development. However, this initiative is now closed and its approach is out of the scope of the present project.

Coastal Resilience to Climate Change

With this project funded by SIDA, IUCN is contributing to the emergence of nature-based solutions for building resilience in vulnerable and poor coastal communities in Mozambique. The Programme is designed to deliver against four main outcomes:

- Community social resilience
- Economic resilience
- Ecological resilience
- Institutional strengthening

These outcomes are to be delivered through the following operational results:

- Programme partners and stakeholders mobilized, trained and working together to effectively deliver the Programme;
- Community and District constituencies established to enable effective engagement in improving coastal resilience through sustainable and inclusive land and sea resource use using ecosystem and rights based approaches;
- Community resilience strengthening actions carried out in an inclusive and participatory manner involving men and women and resulting in tangible benefits and positive changes in governance, natural resource management and local level livelihoods;
- Policies, regulatory frameworks and governmental organizations at national, provincial and district level better enabling and supporting coastal community resilience action;
- Innovative conservation finance mechanisms established to ensure longer term investments in and sustainability of resilience and adaptation action.

3.6.4. GEF interventions

The proposed project will intervene in the area of international waters. The GEF has supported a series of other past and present projects that address these same areas and associated global environmental problems (Table 6). The present project will build on and be closely coordinated with these interventions.

Moe specifically, the World Bank /GEF project “Sustainable Groundwater Management in SADC Member States”, detailed in previous sections, is the current GEF intervention of the highest interest for the present project.

A full list of GEF interventions in Mozambique and Zimbabwe is provided in Appendix 3.

Table 5: Current and past GEF interventions that are of particular relevance to this project

ID	Title	Agency	Focal area	Status	Countries involved	Project Summary
4966	Sustainable Groundwater Management in SADC Member States	The World Bank	International Waters	Project Approved	Seychelles, Swaziland, Tanzania, Malawi, Zimbabwe, South Africa, Angola, Namibia, Botswana, Congo DR, Zambia, Lesotho	To Develop and Enable Sustainable Management of Groundwater at National and Transboundary Levels Across SADC Member States.
970	Groundwater and Drought Management in SADC	The World Bank	International Waters	Completed	Botswana, South Africa, Zimbabwe, Mozambique	The objective of the project is for the SADC member states to develop cooperatively a strategic regional approach to support and enhance the capacity of its member States in the definition of drought management policies, specifically in relation to the role, availability (magnitude and recharge) and supply potential of groundwater resources. This will assist in reconciling the demands for socio-economic development and those of the principal groundwater-dependent ecosystems. Tools will be elaborated for regional cooperative management of transboundary aquifers and to guide sustainable downstream investments in proactive drought mitigation.
1247	Addressing Land-based Activities in the Western Indian Ocean (WIO-LaB)	United Nations Environment Programme	International Waters	Completed	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania	

ID	Title	Agency	Focal area	Status	Countries involved	Project Summary
1462	Programme for the Agulhas and Somali Current Large Marine Ecosystems: Agulhas and Somali Current Large Marine Ecosystems Project (ASCLMEs)	United Nations Development Programme	International Waters	Project Approved	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania	
2098	Western Indian Ocean Marine Highway Development and Coastal and Marine Contamination Prevention Project	The World Bank	International Waters	Completed	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania	
2129	Demonstrating and Capturing Best Practices and Technologies for the Reduction of Land-sourced Impacts Resulting from Coastal Tourism	United Nations Environment Programme	International Waters	Completed	Senegal, Nigeria, Ghana, Kenya, Mozambique, Seychelles, Tanzania, Cameroon, Gambia	
3401	SIP: Equatorial Africa Deposition Network (EADN)	United Nations Environment Programme	Land Degradation, International Waters	Project Approved	Malawi, Ghana, Tanzania, Rwanda, Cote d'Ivoire, Burundi, Kenya, Uganda, Mozambique, Nigeria	
5513	Western Indian Ocean Large Marine Ecosystems Strategic Action Programme Policy Harmonization and Institutional Reforms (SAPPHIRE)	United Nations Development Programme	International Waters	Project Approved	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, South Africa, Tanzania	

ID	Title	Agency	Focal area	Status	Countries involved	Project Summary
4487	LME-AF Strategic Partnership for Sustainable Fisheries Management in the Large Marine Ecosystems in Africa (PROGRAM)	The World Bank	International Waters	Concept Approved	Comoros, Mauritania, Mozambique, Tanzania	
5905	First South West Indian Ocean Fisheries Governance and Shared Growth Project (SWIOFish 1)	The World Bank	International Waters	Project Approved	Comoros, Mozambique, Tanzania	
4940	Implementation of the Strategic Action Programme for the Protection of the Western Indian Ocean from Land-based Sources and Activities (WIO-SAP)	United Nations Environment Programme	International Waters	Project Approved	Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, Tanzania, Somalia	

3.6.5. Identified co-financing

Co-financing that will support the present project comes mainly from on-going or planned projects that focus on transboundary water resource management in the three basins and/or in the SADC region:

Projects with international funding

- The **BMZ/DFID** project, implemented by **GIZ** and **SADC** Secretariat, with GWP-SA, to support *Transboundary Water Management in SADC* (Overall budget **EUR 14,200,000**, specific budget for activities in Mozambique and Zimbabwe (BUPUSA) **EUR 350,000,** 2016-2019) (ie USD 410,000);
- The **BMZ/DFID** project, implemented by **GIZ** and **SADC** Secretariat, to support *Community based flood early warning in SADC* (Overall budget **EUR 14,200,000**, specific budget for activities in Mozambique (Buzi replication) **EUR 90,000,** 2016-2019) (ie USD 105,000);
- Building climate resilience of vulnerable agricultural livelihoods in Southern Zimbabwe (**USD 33,388,272** million, 2019-2025);
- Climate Resilient Infrastructure Development Facility (**CRIDF/DFID-UKaid**) projects (**USD *2,770,000*).**
- Transboundary Water Resources Management Programme for Africa (GRID-Arendal, **USD 200,000**)
- The National Water Resources Masterplan Project (World Bank): **USD 2 900 000** is being implemented by the Government of Zimbabwe. This project is aimed at developing a national blue-print for the conservation, management and use of the country's water resources.

In addition, the project will liaise closely with other agencies involved in water resource management and adaptation to climate change to insure synergies with upcoming projects.

National co-financing by recipient governments

Mozambique

- In-kind contribution in Mozambique USD:416 800 (Staff time – 172 000, Office Space – 204 000, Vehicles - 40 000)

Zimbabwe

- The Save and Runde Catchments River Outline Plans (Zimbabwean government funded project): USD 200 000. It is an initiative being conducted through the Save and Runde Catchment Councils with technical assistance from the Zimbabwe National Water Authority. The project aims at developing strategic plans for each basin.
- The Command Water Harvesting Programme (funded by the Government of Zimbabwe through the Water Fund): USD 2 000 000. It is a livelihoods-oriented water project being. It is implemented nationally and aims at building capacity to harvest rain water in rural and urban communities as a drought mitigation mechanism.
- National Water Resources Masterplan Project, USD2,900,000;
- Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway (SECA) Project (2016-2020) USD33,175,000.
- In-kind contribution in Zimbabwe: USD 530,000 (Office space $120 000, Staff time $400 000, Vehicles $10 000)

Country co-finance is specified to:

Vehicles – a vehicle at national office in each country that will be available for logistical purposes whenever required, and a vehicle in each basin management agency (ZINWA and ARA CENTRO) that will be provided for technical work in the basins, wheneveer required.

Office – ARA CENTRO will provide office space for PMU staff in Beira and ZINWA will provide offcie space for PMU staff in Mutare

Staff positions – staff memebers will provide some of their time to the project. This include one technical person providing up to 40% in each basin agency and the head of the basin agency giving 20% of their time to this project. From the national office in each country, the Chief Hydrological Officer will give up to 15% of their time to the implementation of this project.

IUCN Contribution

- Building River Dialogue and Governance Phase 4 (IUCN, 2019-2021), **Co-financing USD 531,426;**

4. Intervention Strategy

4.1 Project rationale and expected global environmental output

The project is centred on 4 cross-cutting challenges described hereunder.

a) Reversing environmental degradation in the Pungwe, Buzi and Save basins

The overuse and misuse of land and water resources in the PUBUSA basins is degrading aquatic and connected ecosystems in the basins and downstream of the Banco de Sofala, thus affecting services they render and ultimately the livelihoods of the riverine population. This, coupled with the pollution from mining activities, intensive agriculture, urban settlements, evolution in sediment load, and on the other hand changes in flow regimes due to abstractions and regulation infrastructure, is very likely to impact more on ecosystems. Consequently, a combination of climatic, ecological and economic issues will increase the basin's susceptibility to environmental damage if not carefully managed.

b) Strengthening resilience to floods and droughts

Mozambique and Zimbabwe countries are vulnerable to climate and water related risks. With its position as a coastal state and recipient of several transboundary rivers, Mozambique regularly suffers from floods and cyclones. The climate characteristics of the Save Veld in Zimbabwe makes the region particularly sensitive to drought occurrences. In both countries, the Chimanimani mountainous areas along the border are prone to flash floods. Thus, the countries share the concern of developing their resilience to climate and water-induced hazards. Cooperation in this regard benefits their upstream-downstream basin relationships and enables experience sharing in similar concerns.

c) Improving insititutional capacity for integrated basin planning

Individually, Mozambique and Zimbabwe have developed policies, laws and regulations to address the management of water resources of their countries, including many of the issues described above. At the regional level, there is still a need for improved institutional capacity and governance mechanisms to deal with the cumulative challenges posed at the bilateral level, such as e-flows implementation, integrated water and environment management planning or risk mitigation. Addressing these problems from the top down through regional harmonization and from the bottom up through increased participation by local government and community stakeholders is a possible approach. The project will thus have a quadruple capacity building focusing on:

- Empowerment of communities for developing their resilience to climate and water related risks,
- Participation of stakeholders in planning through the involvement of basin-scale instances that include representatives (civil society, private sector, etc.).
- Supporting national administrations to strengthen monitoring and knowledge, management/decision support tools and enforcement framework.
- Enhancing regional cooperation framework to build trust and develop synergies

Thus, the GEF project aims to strengthen and support the countries' capacity in water governance, negotiation and benefits sharing and will promote the exchange of experiences between them on specific issues in each basin in terms of IWRM implementation level.

d) Promoting cooperation through Transboundary Water Resources Management

Bilateral transboundary cooperation for the management of the PUBUSA basins is under development, and several important achievements have already been reached, such as the establishment of the Joint Water Commission, the development of Monographs and strategies for each basin, the signing of the Pungwe Agreement, or more operationally, joint water quality campaigns and data exchange during floods. Both countries wish to strengthen cooperation. They are currently finalising Buzi and Save basin agreements, and wish to establish a bilateral tri-basin institution.

The project will contribute to the bilateral cooperation enhancement by:

- Building trust: creating common working habits, developing operational staff relationship, sharing understanding of concerns,
- Developing technical synergies: elaborating common methodologies and tools and exchanging innovative experiences on the one hand and good practices on the other.
- Planning the basins' future together: finding sustainable solutions to the current and future development issues in shared basins.

The project aims at carrying out a regional Transboundary Diagnosis Analysis (TDA) based on the existing Monographs and creating a Strategic Action Programme (SAP) for the integrated management of the shared resources in the 3 transboundary basins. The TDA and SAP will be endorsed by the riparian countries, under the auspices of JWC. To ease the TDA and SAP elaboration and validation process, and to ensure stakeholders' continuous involvement, capacity strengthening activities about the TDA and SAP methodology will be implemented. These activities will address issues such as the unequal capacities, overlapping responsibilities, sectorial approaches to water resource and ecosystems management, and inadequate enforcement of laws. The SAP is consistent with the SADC Revised Protocol on shared watercourses, which carries an objective "to promote a co-ordinated and integrated environmentally sound development and management of shared watercourses", and with the objectives laid out in Agenda 21, Chapter 18, of the Rio Declaration.

4.2 Project Core Principles

The project is proposed to rely on the following principles:

Legality: ensure the suggested activities remain in the frame of the national laws, policies and strategies,

Legitimacy: ensure local communities and beneficiaries are represented at all levels,

Promote local communities empowerment for better autonomy, appropriation and improved results sustainability,

Build on existing or recent initiatives and projects on an incremental manner (BRIDGE, Pungwe Programme, etc)

Communication and awareness raising about IWRM, forest conservation, sustainability, etc.

Gender: Gender and human rights will be mainstreamed in water and public participation approaches, through trainings held, tools introduced and dialogues. The proactive inclusion of women will be a key transverse theme at basin, national and regional levels building on successful experiences from other projects being implemented in the region by IUCN. The IUCN's Gender Responsive Action Tool (GReACT!) will be used to shape the design, implementation and monitoring of all project activities in a gender-responsive manner. The tool can be found in (Annex 13) and will, in the inception phase, be adapted to the type of activities expected in this project. During implementation, all aspects of the project, inclusive of training and capacity building activities will ensure there is gender equality in how problems are being addressed and how the project benefit the population throughout the project (eg:Outputs 1.2.1, 2.1.2, 3.1.2).

4.3 Expected Impact

The specific goal of the project 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 in Zimbabwe and Mozambique.

The GEF project will base its activities on the baseline projects (section 3.6) that are specifically dedicated to water resource management and associated risks mitigation.

The GEF project will consider water resources management in an integrated manner, with different levels of integration:

- **Sectoral integration** - among the different thematic domains connected to water and represented by line ministries: water resources, environment and biodiversity protection, water uses (domestic supply and sanitation, agriculture, fisheries, energy, mines, industry, forestry) and land use
- **Functional integration** - ranging from monitoring to planning, policy-making, development, operation, enforcement
- **Institutional integration** - of different categories of stakeholders: administration, public institutions, research institutes, civil society, private sector, etc.
- **Integration of the fractal scales of IWRM** with relevance of managing water at the transboundary basin / national portion of basin, catchment, sub-catchment scales (and even sometimes at lower levels), involving each time appropriate categories of stakeholders

To address the challenges outlined in Section 4.1 above and meet the proposed objectives, the project focuses on 3 technical components:

- **Component 1** - will contribute to strengthening water and climate related risk management through the reinforcement of monitoring systems, the development of real-time operational tools, and the empowerment of communities in their flood and drought mitigation autonomy.
- **Component 2** - will focus on enhancing ecosystems services through developing the understanding of these ecosystems services (location, characteristics, valuation); quantitative water management, including operationalisation of environmental flows (assessment and legal framework establishment).

- **Component 3 -** is an integrative component that will strengthen the monitoring and assessments developed in the two first components to establish a TDA and a SAP at basins level. National inter-ministerial committees and technical advisory teams are needed to develop these planning tools in a participative manner that guarantees the commitment in its implementation.
- **Component 4 –** will focus on the effective management of the project. This includes procurement, monitoring exercises and project meetings. It also includes mid and end of term project evaluations and audits.

Thus, the project aims to achieve the three following major outcomes:

- Floods and droughts management in the Pungwe, Save and Buzi basins is improved and related risks mitigated
- Improved water ecosystems of the Pungwe, Save and Buzi basins deliver sustainable functions and services to people and nature
- National and transboundary capacity is improved for integrated management of the basins

These outcomes will collectively address environmental challenges described in Section 4.1. All these will be achieved by ensuring gender equality is embedded in all interventions so benefits will reach population in a inclusive and equal manner. The project will ensure in particular that most vulnerable groups, including women and youths, are benefiting from the implementation of the activities and the project outcomes.

The project will source specialist equipment and produce scientific material that will form part of the important legacy the project leaves behind. It is anticipated that these resources will be used by the respective basin management agencies (ARA-CENTRO and ZINWA-SAVE) beyond the project's conclusion, and contribute to the sustainable management of the shared river basins. At the end of the project, these outputs will be handed over to the JWC, the current apex institution of the shared basins, and are expected to be housed in the basin management agencies. These include:

- Hydromet Equipment
- Basin Atlas
- TDA
- SAP

Once the tri-basin secretariat is established, the material will be permanently moved to its premises.

4.4 Project components, their Expected Outcomes, Outputs and Activities

To attain the project objectives, the project will be implemented through 4 main components (3 technical and 1 operational) and associated outcome, outputs and activities as described in Table 1 and Sections that follow.

Table 6: Logical framework

Project Components	Project Outcomes	Project Outputs	Activities
Component 1: Floods and droughts management in the Pungwe, Save and Buzi basins improved and related risks mitigated	Outcome 1.1. Management of floods in the Pungwe, Save and Buzi basins is improved and related risks mitigated	Output 1.1.1. Improved water resources monitoring, warning and information system in support of flood risk management	Activity 1.1 Strengthen the regional hydro-met monitoring network
			Activity 1.2: Operationalise efficient exchange of data between the riparians for flood early warning systems.
		Output 1.1.2. Flood risk & vulnerability characterised	Activity 1.3 Support flood modelling development for flood hazard and vulnerability mapping
	Outcome 1.2 - Improved drought resilience at national and transboundary level	Output 1.2.1 - JWC, member States and communities' capacities for drought response is strengthened	Activity 1.4: Assess the basin communities' resilience to drought using participatory approaches
			Activity 1.5: Organize training on the technical tools needed for drought forecasting and mitigation
			Activity 1.6: Improve community resilience to flood and draughts by strengthening community-based EWS
		Output 1.2.2 Project progress towards outcomes documented and shared with all stakeholders	Activity 1.7: Organise project annual reporting, review and planning including M&E missions
			Activity 1.8: Organise project steering committee meetings

Component 2: Conserving and restoring ecosystems for sustainable livelihoods	Outcome 2.1 - Improved water ecosystems of the Pungwe, Save and Buzi basins for sustainable functions and services to people and nature	Output 2.1.1 - Shared diagnosis of ecosystems status, functioning and economic value established	Activity 2.1: Characterize the ecosystems connected to the river system and value their benefits
			Activity 2.2: Identify hotspots where groundwater resources can be expended to mitigate water supply through sustainable conjunctive management approaches
		Output 2.1.2 - Strengthened Environmental Flow management framework for improved decision making	Activity 2.3: Determine e-flows for priority ecosystems using identified suitable sites across the basin.
			Activity 2.4: Using assessment results from 2.3, determine the trade-offs and options for improved flow management in the Save Basin
			Activity 2.5: Determine the optimal flow regulations in coastal areas
			Activity 2.6: Develop transboundary regulatory framework for e-flows implementation, including legal texts, data exchange operational procedures, and enforcement.
			Activity 2.7: Build stakeholders capacity for environmental mainstreaming and e-flows implementation
		Output 2.1.3. Project progress towards outcomes documented and shared with all stakeholders	Activity 2.8: Organise project annual reporting, review and planning including M&E missions
			Activity 2.9: Organise project steering committee meetings
Component 3: Integrated basin planning for the Pungwe - Buzi – Save River Basins	Outcome 3.1 - Zimbabwe and Mozambique JWC agrees on updated shared water resources strategy and programme for joint ecosystem based	Output 3.1.1 - Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) developed, building on existing Monographs, and Pungwe-Save-Buzi Strategic Action Program (SAP) developed, building on the TDA	Activity 3.1 Develop a Transboundary Diagnostic Analysis that includes ground and surface water resources
			Activity 3.2. Provide scientifically-based and credible evidence of changes occurring in the Buzi, Pungwe and Save River Basins and highlighting their causes as well as their land, water, coastal and marine linkages

	management of the Pungwe-Buzi-Save river basins	and IWRM regional (SADC) / basin / national plans & adopted at ministerial level (JWC)	Activity 3.3 Develop a tri-basin Strategic Action Programme (SAP)
		Output 3.1.2 - Institutional capacity for integrated planning strengthened	Activity 3.4: Facilitate the inclusion of groundwater management mandate into the JWC
			Activity 3.5 Update of the transboundary water dispute database
			Activity 3.6 Identify and participate in knowledge/experience sharing opportunities at international level, including the IW Learn platform
		Output 3.1.3 - Funds raised for SAP implementation	Activity 3.7 Develop a resource mobilisation strategy, by cross-cutting basin priorities and donors policies
		Output 3.1.4 Project progress towards outcomes documented and shared with all stakeholders	Activity 3.8: Organise project annual reporting, review and planning including M&E missions
			Activity 3.9: Organise project steering committee meetings
Component 4: Project Management Costs	Outcome 4.1 - Project is effectively and efficiently managed	Output 4.1.1 - Project management team established and functional	Activity 4.1: Appoint the project management and coordination units at regional and national levels.
			Activity 4.2: Procure office equipment to the project management and coordination units
		Output 4.1.2 – Project evaluation and audit mission carried out	Activity 4.5: Organise Project mid-term and termination evaluations, and audits

4.4.1 Component 1: Flood and Drought Warning and Mitigation

Both the Mozambican and Zimbabwean parts of the three basins are climate-vulnerable areas, with Mozambique more particularly prone to floods and cyclones, and Zimbabwe recurrently suffering from droughts in its south-eastern part. This component proposes to:

- Develop the understanding of both flood and drought processes and risks,
- Improve early warning mechanisms for both floods and drought, and;
- Develop response capacity of relevant government agencies and local communities

Outcome 1.1: Management of floods and droughts in the Pungwe, Save and Buzi basins is improved and related risks mitigated

Output 1.1.1: Improved water resources monitoring, early warning and information system in support of flood risk management

A sustainable and robust monitoring and information system is an essential element for water & climate risks mitigation. Reliability of water information and availability of long term data series are a prerequisite for any planning or operations of quantitative water resource management.

Activity 1.1 - Strengthen the regional hydro-met monitoring network

Baseline: both countries have an existing monitoring network in place place based on the support of several projects to strengthen the networks such as the PP2, Hydromet project. However, the existing monitoring network still suffers from weaknesses, such as:

- Lack of sustainability of installed stations (vandalism, maintenance, robustness of material…),
- Lack of real-time transmission,
- Inadequate network density for accurate forecasting and monitoring.

In collaboration with the DGNRH, the ARA-Centro, the INAME and the INGC in Mozambique, and the MEWC, CPU and ZINWA in Zimbabwe, the project will work to identify the need for strengthening the real-time meteorological and hydrological networks for improving the understanding the climate impacts on water resources. This will improve data collection, analysis, and strengthen data sharing and cooperation between the countries both sharing similar climate change impacts This activity will contribute to defining the stations with common water resources and flood management interest, for which data acquisition and sharing is particularly relevant. This activity will comprise:

i. Identification of the existing stations to use for monitoring
ii. Desk (google earth) and field determination of precise site location,
iii. Support to stations for operation, data transmission and management,
iv. Support to hydrometric governance sustainability,
v. Annex drafting for the Pungwe agreement for the location of strategic hydromet stations,

Specific attention will be given to the sustainability of the network, such as its robustness, maintenance and degradations prevention. The implementation will build on national experience acquired during other initiatives such as HydroMet, Zambezi and Limpopo basins.

This activity shall rely on the intervention of the national hydrology and meteorological services (ARA-Centro and INAME in Mozambique, ZINWA and MEWC-Meteorological Department in Zimbabwe). The Team IWRM experts will provide technical support for network development strategy and implementation using lessons learnt from previous experiences including stations location and hardware and enable transboundary coordination through 2 regional workshops, 4 national meetings and 2 training sessions.

Activity 1.2 : Operationalise efficient exchange of data between the riparians for flood and early warning systems.

Baseline: Systems for recording and archiving hydrological data exist both in Mozambique and Zimbabwe, but these are not effectively used and there is no real-time display of data.

The development of data sharing between Mozambique and Zimbabwe needs to rely on commonly developed and jointly approved procedures. Such procedure can only be operational and sustainable if they are clearly defined, if the budgetary issue has been discussed and if both parties find an interest to them. Their elaboration shall base both on technical assessment (expectations, data collection methods, indicators, formats), on institutional issues (analysis of data flow, ownership & transmission decision, benefits and constraints for data sharing) and include cost considerations. A strategy for implementation shall be developed, including testing, identification of potential barriers and solutions.

A mobile application was developed in the IUCN BRIDGE programme, which uses real time data display. This application can be used for sharing information from different data providers (field data such as raw water level data, regional and global data such as indicators derived from weather forecast or spatial altimetry, field alerts transmitted by communities). The activity will comprise the efficient capturing and sharing of data , the training of operators and users.

The different stakeholders and administrations will be trained in the use and maintenance of the information system so as to be fully conversant with the system to ensure sustainability after project end. This will include data capture, analysis, maintenance, risk management, and costs and financing strategies, : both with on-the-job training for system administrators, and with training sessions for system users (DGNRH, ARA-Centro & ARA-Sul, INAME, INGC and their provincial & district administrations in Mozambique; ZINWA-Save & Runde, MEWC, CPU and administrations at Provincial and District level in Zimbabwe) through two regional workshops, two national meetings and two training sessions are planned. For ensuring full transfer, full-time counterpart staff is expected in each country for the duration of the activity.

Drought early warning systems are an important component of hydrological risk management as their strength lies in planning and preparation for the identification of current or upcoming hazards and provides an assessment of the associated risk related to the hazards. Key steps include identifying the right data to share and transfer that allows stakeholders to detect when and if a drought hazard may occur and the location and severity of the hazard. A process with drought stakeholders will be established that will determine if drought warnings are expressed due to the drought hazard itself, or on the associated risk towards specific vulnerable sectors or areas (for example, water shortages, or crop yield reductions etc).

For ensuring full transfer, full-time counterpart staff are expected in each country for the duration of the activity. Staff must come with experience of floods and droughts, and different agencies must source these different experiences and skills.

Output 1.1.2: Flood risk & vulnerability characterised

Activity 1.3: Support flood modelling development for flood hazard and vulnerability mapping

In collaboration with the INGC, DGNRH, & ARA-Centro in Mozambique and the MEWC, ZINWA & CPU in Zimbabwe, the objective is to develop the understanding and modelling of flood dynamics. The model will be calibrated on both historical hydrologic data and community observations. The activity will include both hydrological and hydraulic modelling. Flood hazard and vulnerability maps will be produced for the 3 basins based on nationally determined return periods, taking into account the latest GCM data, verified with national meteorological agencies, using their specific national conditions and experience.

In the flood-prone areas mapped, the project will support the identification of socio-economic risks to urban and rural settlements, agricultural activities, industrial areas, etc., land use maps, remote sensing and elevation/terrain data. Cross-cutting the socio-economic vulnerability mapping with flood hazard maps will enable the characterization of flood risk and identify priority areas. This activity will entail a substantial capacity building exercise with key stakeholders down to the district level, and the information produced will also be shares with local district authorities. Six capacity building sessions are planned – one per basin per country.

The project plans to use the first globally available DEM (30m resolution) to verify low lying areas, and based on these results, focus on sensitive areas where LIDAR topographic surveys will be carried out to more accurately determine flooding risks. The administrations are willing to be involved in this activity, as both countries have already carried flood risk mapping initiatives. Modelling consultants will be hired for co-developing the model and training the administrations. Full-time counterpart staff are expected in each country for the duration of the activity. 6 national meetings and 2 regional workshop will be organised. Open-source software will be used for this activity to ensure sustainability of the system.

Output 1.1.3: Drought risk and vulnerability assessed

Activity 1.4: Assess the basin communities' resilience to drought using participatory approaches

Baseline: currently, there are no participatory drought resilience assessments being done

The project will support the national meteorological and disaster management services for the development of early warning alert messages and dissemination for drought situations. This activity will build on existing initiatives, and involve end-user representatives. The existing and potential dissemination methods will be assessed (utilization, reliability, etc), involving all presently active telecommunication service providers and radios to ensure maximum coverage of local at-risk communities. An information and dissemination strategy with procedures will be proposed. The vector, content, format (local languages), recipients and timing of the messages will be determined. The robustness of the system will be assessed.

For drought early warning messages, the activity will concern support to farmers, through agricultural extension services. The possibility of supporting regional companies that provide these types of services to develop specific products can be investigated, including pricing conditions.

The activity will involve consultants (sociologists and telecommunication experts) working hand in hand with administrations to benefit from the experience of the previous initiatives (DATAWIN, RANET). The field work will be mutualized with Activity 1.6. Two national meetings and one regional workshop are planned for piloting the activity. Two capacity building sessions are also budgeted for.

The identification of the timing and location of a drought event is the first step in a drought

assessment or drought management process. It is based on different types of drought

indices each representing the state of a specific drought related issue at different times. Drought indices could cover the entire spectrum of drought types: meteorological, agricultural and hydrological drought, but should also take into account land use practices and conditions, as this can often affect water use and availability and this is poorly incorporated into conventional drought indices. Spatially distributed indices are often a requirement as well, as the location of the drought hazard.

The exposure to drought relates to the identification of sectors, areas, and stakeholder groups particularly sensitive to drought through impacts or consequences such as reduced crop yield, livestock losses, socioeconomic impacts or reservoir depletion. Examples of areas exposed to drought could be rain-fed agricultural areas or urban areas relying on surface water resources.

Impact assessments will be developed that aim to quantifying how the identified hazards affects specific areas, sectors, stakeholders and specific communities exposed to this hazard. This activity will describe how specific drought related hazards impact e.g. the agricultural production or the water supply for example. Impact could be expressed in terms of direct losses, or changes but also in terms of hazard or drought categories within a specific exposed area. A typical way to illustrate drought impact is through the use of drought categories where areas within drought categories are calculated and presented in tables. These areas will be driven by community consultation, to determine their understanding and resilience to cope with the potential drought impacts. The impacts would be divided into exposed categories, e.g. rainfed areas, urban areas etc, and the risk expressed based on the vulnerability towards the impact from a specific hazard, or as the likelihood of harm, loss or disaster for a specific drought related hazard.

Outcome 1.2: Improved drought resilience at national and transboundary level

Output 1.2.1: JWC, member States and communities' capacities for drought response is strengthened

Activity 1.4: Assess the basin communities' resilience to drought using participatory approaches

The project will support the national meteorological and disaster management services for the development of early warning alert messages dissemination, for drought situations. This activity will build on existing initiatives, and involve end-users representatives. The existing and potential dissemination methods will be assessed (utilization, reliability, etc involving all presently active telecommunication service providers and radios to ensure maximum coverage of local at-risk communities. A dissemination strategy with dissemination procedures will be proposed. The vector, content, format (local languages), recipients and timing of the messages will be determined. The robustness of the system will need to be assessed.

For drought early warning messages, the activity will mainly concern support to farmers, eventually through agricultural extension services. The possibility of supporting regional companies that provide these types of services to develop specific products can be investigated, including pricing conditions.

The activity will involve consultants (sociologists and telecommunication experts) working hand in hand with administrations to benefit from the experience of the previous initiatives (DATAWIN, RANET). The field work will be mutualized with Activity 1.6. Two national meetings and one regional workshops are planned for piloting the activity. Two capacity building sessions are also budgeted for.

Activity 1.5: Organize training needed for drought forecasting and mitigation

Sustainability of any project requires adequate capacity building. Each activity will include a capacity assessment review during the inception phase. These findings will be used to develop an adequate capacity building strategy (co-development, on-the-job training, train-the-trainers, training sessions) for each activity, under the overall coordination of the Team IWRM experts. Flood risk training will be divided from drought risk training activities. Some stakeholders, disaster risk and management agencies for example, will be relevant to both, but each training will be targeted to core stakeholders and agencies that deal with drought or flooding, or those that have to deal with both, for example, agriculture.

This activity will be implemented by the consultants and experts mobilized in the previous activities. In total, 14 sessions have been budgeted for in Component 1.

Activity 1.6: Improve community resilience to flood and droughts by strengthening community-based EWS

Baseline: Mozambique has developed an advanced Community Early Warning Systems (SIDAPs) in the Buzi basin, that has inspired the law for Natural Disaster Management, and which has been replicated in many other basins in Mozambique. However, in the Pungwe Basin, there is a formal early warning system operated by ARA-Centro and Local Committees for Disaster Management (CLGC), but the decentralized community-based system is not yet operational and articulated with the administrative system. For instance, the ARA staff gauge reader is not part of the CLGC. In the Save basin, a SIDAPS was installed in 2009/2012 by GIZ/ARAC/INGC, but needs some renovations to function effectively. All the early warning systems in the three basins function at a national level; with no coordination with Zimbabwe.

In Zimbabwe, community flood management relies on community-based disaster risk management (CBDRM) trainings at ward level through the ward disaster risk management committee. Participants that are drawn from the Ward Development Committee draft a disaster risk management plan. There is an operational Manual for Management of Flood Emergencies that is used by district Civil Protection committees (in flood prone areas) and is complemented by DRM plans with details on mitigation aspects.

This activity aims at both supporting and reinforcing the autonomy of communities in:

(i)their flood response, by strengthening their prevention and reaction capacity, together with their networking at basin scale. This activity will comprise:

- Current community-based early warning system evaluative assessment, Risk assessment at community level, both based on community experience (community flood mapping, identification of indigenous indicators, drought vulnerabilties) and on extension of technical outputs of the previous activities (flood risk assessment, drought early warning);
- Establishment or review of the community model architecture and procedures (inter-community/upstream-downstream & local authorities warning, intra-community warning & response), a part of it being co-constructed with the communities; Inclusion of a transboundary dimension;

- Design of community-level interventions, specifically for drought: Drought assessments
- Climate outlook forums
- Education and outreach approaches, in particular on community risk and vulnerability, and response strategies, and
- Engaging the preparedness community

Output 1.2.2 Project progress towards outcomes documented and shared with all stakeholders

*Activity 1.7: Organise project annual reporting, review and planning including M&E missions*Annual technical and financial reports will be prepared, validated and submitted to the GEF. National executing agencies will contribute to these reports to be consolidated by the regional executing agencies and will be sent to the implementation agency for submission to the GEF. Annual project review and planning workshops will be organised in year 3 to analyse the progress made and plan for the next year. Periodic monitoring and supervision missions will be organised to assess the course the project and collect M&E data from the national executing agencies.

Activity 1.8: Organise project steering committee meetings

The annual technical and financial reports will be submitted to the project regional steering committee to seek for advice, guidance and strategic orientation on the direction of the project.

4.4.2. Component 2: Conserving and restoring ecosystems for sustainable livelihoods

Ecosystems and ecosystems services conservation is one of the core concerns of quantitative water management, though quite difficult to implement as priority is often given to economic and social, compared to environmental, uses of water. The assessment and implementation of environmental flows is considered a priority by both Mozambique and Zimbabwe.

According to IUCN, "*An environmental flow is the water regime provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated*"[8]. Though conceptually easy to understand, e-flows appeal to be quite complex developments, and the awareness of what e-flows can and cannot bring to IWRM is not widespread. However, as in any transboundary basin, environmental flows are a cornerstone of cross-border allocation and water sharing decisions.

Determining 'objective' flows in strategic points rely both on e-flows determination (flows to feed ecosystems) and allocation (e-flows + flows to feed downstream uses). This scope requires the following stages:

- Identification and characterization of key ecosystems connected to rivers (aquatic, wetlands, groundwater), and of their water needs;

[8] IUCN, 2003. The essentials of environmental flows.

- In parallel, establishment and joint adoption of practical guidelines for transboundary quantitative water management (including e-flows), specific to the 3 transboundary basins;
- Determination of e-flows in a range of "hotspot" ecosystems, and typical aquatic habitats;
- Allocation models development and determination of objective flows in strategic points;
- Endorsement by both countries of objective flow values in the strategic points, and rules for computing these values elsewhere;
- Establishment of legal texts: transboundary framework (for transboundary water sharing) and national frameworks (for water sharing among uses, including the environment).

Outcome 2.1: Improved water ecosystems of the Pungwe, Save and Buzi basins for sustainable functions and services to people and nature

Output 2.1.1: Shared diagnosis of ecosystems status, functioning and economic value established

Activity 2.1: Characterize the ecosystems connected to the river system and value their benefits

Baseline: though jointly agreed that e-flows are a crucial element in quantitative transboundary water management, limited information can be found on ecosystems and their water needs characterization. An assessment is needed at the 3 basins scale relying on research centres and Universities expertise together with provincial and district administrations field knowledge.

Ecosystems services generally tend to be underestimated by decision-makers and under-budgeted in consequence. This activity aims at developing knowledge about aquatic ecosystems and their water needs in the 3 basins, and identifying and valuing both the livelihoods that communities derive from ecosystems and the benefits for formal economic activities. This is both important knowledge for enlightened water management and important information for awareness-raising among decision-makers.

This activity will comprise:

- Ecosystems characterization in identified hotspots across the 3 basins

- identification & description (fish species, habitats, spawning & nesting areas, wetlands identification & hydrological functioning);

- diagnosis of the ecological status (in particular, for the mangrove),

- assessment of pressure (pollution, evolution of the hydrological regime, wood cutting, agriculture, urbanization);

- analysis of the influence of key water parameters (flow, levels, salinity, turbidity, quality) on the estuaries and mangrove area.

- Ecosystems services valuation: identify and characterize the benefits derived from ecosystems connected to the hydro-systems. Field investigations will be held, for instance for estimating fish catch in the identified hotspots
- Ecosystems prioritisation: Designate priority ecosystems, in terms of nature conservation and in terms of economy contribution. This task is the conclusion of the previous ones, so as to highlight and raise awareness on the ecosystems particularly important in terms of services provision/economic contribution and nature conservation. 2 national meetings and a regional workshop will be organised in that regard

The sources of data will be mainly bibliography, national expertise (Academia, central and local administration), and satellite imagery interpretation. A field mission will enable fine-tuning of the desk analysis.

This activity will be handled by a team of consultants that includes environmental and wetlands experts who have specialized in wetlands and aquatic ecosystems, economists with the support of GIS experts and of the Team IWRM experts.

Activity 2.2: Identify hotspots where groundwater resources can be expended to mitigate water supply through sustainable conjunctive management approaches

Substantial groundwater mining is on-going mostly in the Save Basin, for irrigation and domestic water supply purposes. However, despite the important role groundwater plays in sustaining aquatic and terrestrial ecosystems, such as springs, wetlands, rivers and vegetation, no effective monitoring is taking place. Understanding the state of shared aquifers, and their potential to mitigate water supply challenges, will inform a more comprehensive ecosystem evaluation and facilitate enhanced integrated basin planning. In this scope of this project, identified pilot sites will give a first glimpse of the potential of groundwater in the three basins, and help to incorporate groundwater into the basin agreements. With the groundbreaking research being carried out in the region by the SADC-GMI on shared aquifers, this is an opportunity to upscale the new knowledge and fulfill regional objectives on conjunctive water management. . The first stage in a TDA is the collection and compilation of data. The proposed projects therefore seeks to:

- Perform hydrogeological investigations around the identified aquifer hotpots
- Collect biodiversity data and assess the ecological conditions at the aquifer hotspots
- Identify and explain the linkages between groundwater and the ecosystems
- Assess where management interventions should be focused (where sustainable exploitation is most feasible)

Output 2.1.2: Strengthened Environmental Flow management Framework for improved decision making

Activity 2.3: Determine e-flows for priority ecosystems using identified suitable pilot sites across the basin.

Baseline: Currently, dams liable to have transboundary impact have to observe e-flows that are *determined statistically. The BRIDGE initiative, piloted by the IUCN, implemented e-flow training sessions. Lack of capacity was identified as a major constraint to improve the transboundary managements of the shared water resources in both countries. Thus, the aim of the initiative was the development of capacity to assess and manage environmental flows. The IUCN collaborated with Waternet, a SADC subsidiary institution mandated to develop capacity on integrated water resources management in the region. Waternet delivered in 2015 and 2016 two modules to participants responsible for planning and managing the shared river basins in Mozambique and Zimbabwe: Module 1: Principles of Environmental Flows; Module 2: Environmental flows - from Theory to practice. A third Module - Determination of environmental flows for basin planning - is to be organized between September and December 2018.*

This activity will comprise 2 main stages:

- Developing jointly approved guidance for e-flows determination, by adapting an acknowledged international methodology for assessing real ecosystems needs (which are often quite complex) to the basins concerns. For this stage, clear requirements for stakeholder's involvement will be specified.

- Determine e-flows in pilot areas. A set of pilot areas has been defined during the consultation phase held at Project Preparation phase and this is where eflows will be determined. It comprises the following:

Table 7: Pilot sites for component 2

Country	**Pungwe basin**	**Buzi basin**	**Save basin[9]**
Mozambique	Future Pavua dam site (and its potential impact on Gorongosa[10]) Pungwe-Buzi estuary area (from Mafambisse)[11]	Lucite and Zonue[12] rivers Pugwe-Buzi estuary area[11]	Zinave national park downstream the border[13]
Zimbabwe	Pungwe Dam/Pungwe Falls[14] Mutirikwi (formerly Lake Kyle)		Save conservancy area Save-Runde confluence[15] (potential influence of the new Tokwe Mukorsi dam, and future Runde-Tende dam) Condo Dam influence, Runde

The set of pilot sites may need to be fine-tuned based on the results of Activity 2.1.

[9] Due to the high number of dams, this is the basin that offers most possibilities for flows regulation. However, due to the already existing uses, this possibility of operationalizing e-flows may be hard to implement. The Buzi Agreement under negotiations may open the possibility of a water transfer of Buzi waters to the downstream Save.

[10] The management of the Gorongosa national park is considered as a success story with international reputation (Carr foundation), with a specific hydrological functioning described in the Pungwe Monograph. Any dam upstream may influence this equilibrium.

[11] The estuary region and the mangroves area is ecologically connected to the Banco de Sofala, which fish and prawns resources are the most important fishing resource in Mozambique. The mangrove area close to Beira seems quite degraded due to the commercial and industrial activities. Seasonally during low flows, marine salinity flows back in the estuary and the downstream part of the Pungwe. These last years, this phenomenon has affected Beira drinking water supply (slightly saline water supplied seasonally) its intake had to be move upstream, and also due to Mafambisse sugar estates abstractions which are close to Beira. A study of possible solutions to limit salinity intrusion has been conducted during PP2.

[12] This sub-catchment upstream Chicamba dam has developed water uses in its upstream Zimbabwean part. E-flows have been determined during the BRIDGE project.

[13] The Zinave NP comprises wetlands characterised by a set of pools connected to the Save, and are filled by the river.

[14] The city of Mutare, located in the upstream Save basin, is supplied by Pungwe upstream waters and some environmental flows issues are met locally. In 1999 a pipeline that transfers water from the Pungwe River to the Odzani catchment (a part of the Save River basin) to augment supplies to the City of Mutare was constructed. The quantities involved are 0.7m^3/s (22 million m^3 per year) which corresponds to 16% of the mean annual runoff, but 50% of low flows. The water permit is 0.75 m^3/s in Zimbabwe. The agreement with Mozambique is that Mutare can abstract 0.7m^3/s provided there is always 0.5m^3/s in the river. However, this minimum flow is not maintained every year.(Black Crystal Consulting Private Ltd 2013)

[15] The Save-Runde confluence located in the Gonarezhou National Park, is just upstream the border with Mozambique. It is characterized by a set of pools, some of which are flooded by the rivers, and that serve as watering points for wildlife. The Gonarezhou NP in Zimbabwe is the only national park with permanent waterpoints (permanent flows in the rivers).

Specific attention will be given to both recovery of over-allocated systems and protection of unstressed systems.

The lessons learnt from these experimentations will enable fine-tuning of the guidelines, and eventual adaptation for their operational use in environmental evaluations/EFA for projects affecting the hydrological regime (such as dams & big abstractions).

This activity will involve a team of consultants specialised in e-flows determination (wetlands, aquatic ecosystems, and low waters hydrology). 4 national workshops, 2 regional workshops and 2 capacity building sessions are planned for this activity.

Activity 2.4: Using assessment results from 2.3, determine the trade-offs and options for improved flow management in the Save Basin

The activity aims at stablishing e-flow regimes especially to help the recovery of over-allocated systems and for protection of unstressed systems. The pilot results will enable fine-tuning of the guidelines, and eventual adaptation for their operational use in environmental evaluations/EFA for projects affecting the hydrological regime (such as dams & big abstractions).

This activity will focus on water management planning for drought situations. It will define both:

- Drought management procedure, including the definition of water levels warnings and alerts defining vigilance levels, and
- Drought mitigation interventions.

This action plan will be carried in a participative manner (10 national meetings), by the Team IWRM experts. Three capacity building sessions are budgeted.

Activity 2.5: Determine the optimal flow regulations in coastal areas

As part of the source-to-sea e-flows valuation, this activity will extend the e-flows assessment to cover saline water intrusion in the estuaries. A better regulated flow could reduce salinity intrusion caused by the decline in freshwater availability in the dry season but this can only be achieved through strengthened regional cooperation

Activity 2.6: Develop transboundary regulatory framework for e-flows implementation, including legal texts, data exchange operational procedures, and enforcement

To be applied, the methodological guidelines will need to be translated into a legal framework,

Legal consultants will draft regional and national legal texts and procedures. 4 national meetings and 1 regional workshop are planned.

Activity 2.7: Build stakeholders capacity for environmental mainstreaming and e-flows implementation

Environmental mainstreaming in decision-making requires both high-level expertise in specialized administrations, and awareness for commitment of connected sectors. The capacity building activities will thus aim at:

- Strengthening capacities for administration's environmental experts, regarding e-flows determination, This activity will be carried directly by the Team IWRM experts, building on the 'learning by doing' methodologies that have been developed through BRIDGE project;
- Raising awareness of policy-makers and other sectors' administrations, about the importance of a healthier environment both for the economy and for the people, and the operational ways of integrating these considerations into connected activities. It will appeal to on the existing and emerging legal texts (licenses delivery, e-flows).

In total, 7 training sessions will be organised.

Output 2.1.3 Project progress towards outcomes documented and shared with all stakeholders

Activity 2.8: Organise project annual reporting, review and planning including M&E missions

Annual technical and financial reports will be prepared, validated and submitted to the GEF. National executing agencies will contribute to these reports to be consolidated by the regional executing agencies and send to the implementation agency for submission to the GEF. Annual project review and planning workshop will be organised on year 3 to analyse the progress made and plan for next year. Periodic monitoring and supervision missions will be organised to assess the course of project and collect M&E data from the national executing agencies.

Activity 2.9: Organise project steering committee meetings

The annual technical and financial reports will be submitted to the project regional steering committee to seek for advice, guidance and strategic orientation on the project course.

4.4.3 Component 3: Integrated basin planning for the Pungwe - Buzi – Save River Basins

This Component aims at diagnosing the core concerns of the 3 basins and establishing strategic planning, that has a potential of becoming a roadmap for the future tri-basin organisation which is being planned, with the support of the GIZ. The TDA/SAP will build onto the work done through the three basin monographs, and the associated SAP documents previously prepared for the three basins (November 2006 for Pungwe, October 2011 for Buzi and December 2011 for Save) and are considered as reference documents. They however need to be updated

Outcome 3.1: Zimbabwe and Mozambique JWC agrees on updated shared water resources strategy and programme for joint ecosystem based management of the Pungwe- Buzi-Save river basins

Box 2: What is a TDA/SAP?

The Transboundary Diagnostic Analysis/Strategic Action Programme (TDA/SAP) approach is a highly collaborative process that has proven to be a major strategic planning tool for GEF International Waters Projects.

The main technical role of a TDA is to identify, quantify, and set priorities for environmental problems that are transboundary in nature. In particular, the TDA aims to:

- Identify & prioritise the transboundary problems;
- Gather and interpret information on the environmental impacts and socio-economic consequences of each problem;
- Analyse the immediate, underlying, and root causes for each problem, and in particular identify specific practices, sources, locations, and human activity sectors from which environmental degradation arises or threatens to arise.

Ultimately, a TDA provides the factual basis for the formulation of a SAP but the TDA is also part of a larger facilitative process of engagement and consultation with all the key stakeholders from the initial TDA steps through to the subsequent development of alternative solutions during the formulation of the SAP. The TDA is a mechanism to help the participating countries to 'agree on the facts' - many conflicts are driven by perceptions and removing these can be an enormous step in itself. Furthermore, the TDA should be seen as more than just an analysis of data and information. It is a powerful process that can help create confidence among the partners involved.

The SAP is a negotiated policy document that should be endorsed at the highest level of all relevant sectors of government. It establishes clear priorities for action (for example, policy, legal, institutional reforms, or investments) to resolve the priority transboundary problems identified in the TDA. A key element of the SAP is a well-defined baseline. This enables a clear distinction between actions with purely national benefits and those addressing transboundary concerns with global benefits. Another key element involves the development of institutional mechanisms at the regional and national levels for implementing the SAP and monitoring and evaluation procedures to measure effectiveness of the outcomes of the process

Definitions extracted from the GEF Transboundary Diagnostic Analysis/Strategic Action Programme Manual – Volumes 1 to 3 (GEF IW: LEARN, 2013).

For instance, the TDA/SAP approach has been implemented in the Volta Basin from 2005 and led to the adoption of a SAP in 2013.

The TDA identifies and assesses three groups of environmental concerns in the Volta River Basin: water quantity, the degradation of ecosystems, and water quality. The TDA also identifies and assesses cross-cutting concerns, notably those related to governance and climate change. These issues are addressed by the SAP. (Volta Basin Transboundary Diagnostic Analysis, VBA, UNEP/UNOPS/GEF, 2013)

Output 3.1.1: Pungwe-Save-Buzi Transboundary diagnostic analysis (TDA) developed, building on existing Monographs, and Pungwe-Save-Buzi Strategic Action Program (SAP) developed, building on the TDA and IWRM regional (SADC) / basin / national plans & adopted at ministerial level (JWC)

Activity 3.1 Develop a Transboundary Diagnostic Analysis that includes ground and surface water resources

The main objective of the activity will be to identify, quantify, and set priorities for water-related problems that are transboundary in nature and to constitute a factual basis for the further SAP development (Activity 3.3) that can be used as a reference when the tri-basin organisation is to be formed. The TDA development process will be based on the GEF methodology (GEF IW: LEARN, 2013). It will update the 3 monographs and synthetize all the activities lead during the project to establish an updated TDA for each basin and shall include:

- Collection and analysis of data/information at regional, national and local level;
- Integration of the results of the activities lead during the project (ecosystems characterisation (Activity 2.1), revision of the water balance (Activity 3.1) including e-flows)
- Identification & prioritisation of the transboundary problems;
- Determination of the environmental and socio-economic impacts;
- Analysis of the immediate, underlying, and root causes;
- Development of the thematic sections;
- Identification of leverage points and formulation of recommendations;
- Drafting the TDA.

Experts selected by the national administrators will carry out this activity supported by the Team IWRM experts. 2 national meetings and a regional presentation workshop are planned for the consultation of the national and regional technical advisory teams

Activity 3.2. Provide scientifically-based and credible evidence of changes occurring in the Buzi, Pungwe and Save River Basins and highlighting their causes as well as their land, water, coastal and marine linkages

The objective here is to communicate the urgency required in addressing these changes in the SAP. The Activity will be co-funded by GRID-Arendal and implemented with the Southern Africa Regional Documentation Centre (SARDC), and will produce:

- a basin atlas,
- a story map and
- outreach activities to disseminate widely the findings of this initiative.

The *Buzi-Pungwe-Save River Basin Atlas of Our Changing Environment* will inform sustainable use and management of the basin, coastal and marine system. While the Buzi, Pungwe and Save River Basins constitutes a smaller portion of southern Africa, effective management of water resources and climate change adaptation efforts in the basins can provide best practices and lessons which other river basins can adopt for improved livelihoods. As such, the atlas will be a tool for the Buzi, Pungwe and Save River Basins custodians, riparian government structures and SADC, to deploy (where necessary) in directing planning and guiding formulation of improved catchment, coastal and marine management. The Atlas will provide visual representations of changes taking place through change pairs of satellite images, maps and short narratives. The atlas is targeted at policy makers, technical staff/ planners and the public, and it is expected to raise awareness, influence decision making/planning and generate action and interventions at local, national and regional levels. It will inform planning of resilient infrastructure including identification of hope spots such as sites for mini hydro development, water transfer for irrigation, as well as state and trends and outlooks of infrastructures such as the Beira Corridor to inform planning.

Activity 3.3 Develop a tri-basin Strategic Action Programme (SAP)

To establish clear priorities for action (for example, policy, legal, institutional reforms, or investments) to resolve the priority problems identified in the TDA. As a negotiated policy document, it shall be endorsed at the ministerial level

The SAP development process will be directly linked to the previous TDA development (Activity 3.1), since they are parts of the same approach. It will include a rough evaluation of the implementation of the previous Monograph's SAPs. It will be a highly cooperative and collaborative process among the stakeholders. It shall establish clear priorities for action (for example, policy, legal, institutional reforms, or investments) to resolve the priority problems identified in the TDA. As a negotiated policy document, it shall be endorsed at the highest level of all relevant sectors

As for the TDA, the SAP will be developed at the scale of the 3 basins, with basin-specific prioritization of transboundary issues, including:

- monitoring and knowledge development,
- capacity building,
- governance strengthening (capacity building, stakeholders participation, policy/institutional/legal reforms),
- investments to promote economic growth and reduce environmental degradation.

The SAP will also comprise:

- estimation of costs associated to the different actions,
- key IWRM indicators for basin monitoring,
- investment profiles / project sheets presented in formats liable to attract donors,

- stakeholders engagement plan.

Experts made available by national administrations supported by the Team IWRM experts will carry out this activity. Two national meetings and a regional presentation workshop are planned for the consultation of the national and regional technical advisory teams. After the validation, follow-up and support to SAP endorsement and adoption process will be ensured at ministerial and bilateral levels.

Output 3.1.2: Institutional capacity for integrated planning strengthened

Activity 3.4: Expand the mandate of the JWC to include groundwater management

To facilitate conjunctive management of water resources, the tri-basin institution will benefit from the inclusion of a specific groundwater function (e.g. technical committee on groundwater) in the JWC, similar to the organ created within the Limpopo Watercourse Commission (LIMCOM). The activity therefore assesses the institutional capacity needs and implementation plans for such an expanded JWC. A notable target under this objective is the identification of ways of mobilizing financial and human resources, with actions including initiating secondment agreements or MoU to mobilize human resources and securing public-private-partnership opportunities. Activity will compromise three key actions:

- Assessment of the legal feasibility of a groundwater component in the JWC
- Implementations plans for such a ground water function
- Resource mobilization plans (human and financial) for the committee

Activity to be undertaken with input from the expertise from the SADC-GMI

Activity 3.5 Update of the transboundary water dispute database

In collaboration with the Oregon University, that hosts the transboundary dispute database, this activity will be implemented to document knowledge and share experiences through the TDDB's International River Basin Organization Database. The RBO Database is a searchable database that provides detailed institutional design data for more than 120 RBOs in more than 110 internationally shared watercourses. The database highlights the commonalities and differences across RBOs in the way they are set up and in the functions, they fulfill in governing international watercourses. The searchable database allows the user to search for a specific RBO (by RBO name, year of establishment, continent or member countries) and retrieve information on the institutional design characteristics of the respective RBO.

Data on the institutional design of these RBOs includes:

- The membership structure (laterality and inclusiveness of RBOs)
- The functional scope
- The legal foundations and reference to international water law principles
- The level of institutionalization and legalization
- Financing and cost-sharing mechanisms
- Decision-making mechanisms

- Data and information sharing mechanisms
- Environmental and compliance monitoring mechanisms
- Dispute-resolution mechanisms
- Means for including external actors such as civil society groups, NGOs, epistemic communities or other regional institutions:

Activity 3.6 Identify knowledge/experience sharing opportunities at international level, including IW Learn platform

Development of IW LEARN Information products and dissemination. Create knowledge-sharing tools for the exchange of environmental data and information and lessons learned from all relevant projects in the region at national, sub-regional and regional levels including web-based informational packages, the IWLEARN database, newsletters, etc. The project will connect with the GEF IW-LEARN programme that promotes experience sharing and learning among GEF International Waters projects. Experiences and lessons learned from the TDA, SAP and other processes undertaken by this project will be documented and shared. The activity will first identify knowledge/experience sharing opportunities:

- issues relevant for transboundary experience sharing (that will benefit to & valorise each of the parties): experience sharing/knowledge transfer;
- issues with common wish for capacity strengthening: co-development;
- external valorisation of common initiatives.

The activity will then establish corresponding transboundary learning mechanisms (IW learn):

- development of a website for documents sharing,
- networking of homolog partners through common activities/ training/ mailing list (ex. of dialogue barrage) or forum, common writing of technical papers,
- partner with river basin associations, such as the African Network of Basin Organization (ANBO);
- bi-annual GEF conferences, common presentations/presence (Moz-Zim) to selected water events (World Water Week, Africa Water Week, the ANBO and other relevant forums).

Output 3.1.3: Funds raised for SAP implementation

Activity 3.7 Develop a resource mobilisation strategy, by cross-cutting basin priorities and donors policies

This activity is an important corollary of the SAP so that it can be budgeted and incorporated into the planning and budgeting by country administrations into their fundraising approaches. A resource mobilisation strategy will be developed by cross-cutting basin priorities (established in the SAP) and donors policies.

To ensure the implementation and the sustainability of the main project outputs (especially the SAP), a financial mobilisation strategy will be developed to cover the funding needs of the prioritized actions of the SAP. This strategy will be used by the JWC and by the future tri-basin organisation as a tool to advocate the support of their partners for the sustainable management of the transboundary ecosystems in the Pungwe, Buzi and Save basins. This activity will build on the funding needs for the priority actions and possible funding sources identified in the SAP. Possible financial mechanisms will be investigated, including private sector, governmental, international donors and other innovative mechanisms, for supporting SAP.

Output 3.1.4 Project progress towards outcomes documented and shared with all stakeholders

*Activity 3.8: Organise project annual reporting, review and planning including M&E missions*Annual technical and financial reports will be prepared, validated and submitted to the GEF. National executing agencies will contribute to these reports to be consolidated by the regional executing agencies and send to the implementation agency for submission to the GEF. Annual project review and planning workshop will be organised on year 3 to analyse the progress made and plan for next year. Periodic monitoring and supervision missions will be organised to assess the course of project and collect M&E data from the national executing agencies.

Activity 3.9: Organise project steering committee meetings

The annual technical and financial reports will be submitted to the project regional steering committee to seek for advice, guidance and strategic orientation on the project course.

4.4.4 Component 4: Project Management Costs

Outcome 4.1: The Project is effectively and efficiently managed

Output 4.1.1: Project management team established and functional

Activity 4.1: Appoint the project management and coordination units at regional and national levels.

A project team will be recruited to ensure effective and efficient execution of the project activities by all executing agencies. The details of the staff are described in section 5.2 and terms of reference will be developed for each position.

Activity 4.2: Procure office equipment to the project management and coordination units

The project will provide equipment to improve the working conditions for effective and efficient implementation of the field activities. This equipment will be acquired following GEF and IUCN procurement policies;

Output 4.2.2: Project components are monitored and evaluated

Activity 4.3 Prepare project mid-term and termination evaluations, and audits

The Regional executing agency in collaboration with the national ones and the implementing agency will organise one final evaluation mission. Terms of reference for each of these missions will developed to clarify the scope, objectives and expected outcomes. On the other hand, annual financial audits will be conducted to ensure that resources are appropriately used by executing agencies. Annual technical and financial reports will be prepared, validated and submitted to the GEF.

These 3 latter activities will be funded by the budget dedicated to Project Management Costs.

4.5 Risk Analysis and Risk Management Measures

Table below provides risks analysis and the associated mitigation measures.

Risk Description	Level	Mitigation measure(s)
Political instability	Moderate	IUCN in consultation with the executing agency and the GEF Secretariat will suspend the project implementation.
Institutional turn over at national level	Moderate	IUCN and the Executing Agency ensure the participation of directors and managers from the relevant Directorates.
Institutional turn over at local level (MEP extension services, PMU experts, etc.)	Moderate	Strengthen the role of ZINWA and ARA-CENTRO. IUCN and the executing agency will jointly promote measures for a sustained project staffing over the project lifespan.
Climate change impacts at higher than anticipated levels	High	The region is likely to face more droughts and periods of heavy rainfall and the project is flexible enough to function under drier conditions. The project precisely aims at addressing climate risk to increase populations resilience to climate risks (both droughts and floods) and reinforce administrations capacity in risk assessment, monitoring, and mitigation. In this case, the project would even gain relevance. However, in the event of the occurrence of such climate event during the project implementation phase: - Should it occur at the beginning of the project, the actions would be postponed during recovery period, - Should it occur at the end of the project, the actions implemented would have contributed to protect project beneficiaries and improve their response to the event.
Security and stability in the region	Moderate	The PMU will be in close contact with the national administration offices and will have access to security updates. In addition, local stakeholders who are familiar with the local context and able to anticipate this risk will implement the project.
Weak capacity of institutions	Moderate	Institutional strengthening and capacity building will be intensified for the government staff through the provision of appropriate technical assistance, procurement, financial management and disbursement. The provision of continuous support and monitoring by the programme management team will provide rapid response support to emerging implementation challenges.
Low uptake of methods, techniques and tools for the management of water resources;	Low	Outputs of this project are; flood maps and strengthening of the community-early warning systems guidelines for the local managers and technicians, and training of communities on how to use them in the Buzi basin. They will be important compliments to the proposed interventions.

Risk Description	Level	Mitigation measure(s)
Lack of adequate financial commitment by target countries	Moderate	The two countries have, through the PPG process, expressed commitment to this project. However, given the development challenges facing them, there is a risk that other priorities deemed to be more urgent could emerge during the life of the project and threaten the sustainability of expected outputs and outcomes. IUCN will seek acceptable and manageable financial commitments from the member countries to this initiative. The involvement of other partners will also be sought to complement.
Project overwhelms the available capacity and skills to an extent it fails.	High	The Buzi experience of the community EWS proved that the approach proposed is appropriate provided the following steps are being followed: - Ensure a consistent analysis of local capacity, including the intrinsic capacity for innovation. - Propose strategies and plans for capacity building that are based on training needs identified through consultation and on estimated absorption capacity, and that are built on approaches respecting local cultures and while making room for the intrinsic capabilities innovation
Projects become source of conflict	Low	Project will be established through a consultative process and all decisions are made with a bottom-up consultation as much as possible.

4.6 Consistency with national priorities and plans

4.6.1 Project alignment with water resources management policies

Alignment with the SADC framework

Among the regional and international conventions to which both Zimbabwe and Mozambique are party, the SADC revised protocol on shared water resources is of particular significance. The Protocol has the following objectives:

a) *"Promote and facilitate the establishment of shared watercourse agreements and Shared Watercourse Institutions for the management of shared watercourses;*

b) *Advance the sustainable, equitable and reasonable utilisation of the shared watercourses;*
c) *promote a co-ordinated and integrated environmentally sound development and management of shared watercourses;*

d) *promote the harmonisation and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources thereof; and*

e) *promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management."*

Although not directly dedicated to governance framework development, the GEF project will contribute to cooperation strengthening for the shared basins that may in time lead to the establishment of the tri-basin organisation. However, the 3 components are perfectly in line with objectives b) and c) of the Protocol, while capacity building and data exchange activities will concur to objective e) and *Article 3.4*.

With its Component 2, the GEF project also operationalizes Article 3.2 which is about maintaining a proper balance *"between resource development for a higher standard of living for their people and conservation and enhancement of the environment to promote sustainable development",* and Article 4.2. stipulating to; *"jointly, protect and preserve the ecosystems of a shared watercourses, prevent, reduce and control the pollution and environmental degradation of a shared watercourse that may cause significant harm to other Watercourse States or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse."*

Key issues to be addressed under this are also 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 have remained mostly unimplemented to date. IUCN/GEFs involvement as neutral third party will help contribute to the achievement of these commitments and compliance with international treaties.

Alignement with the Pungwe Agreement

The GEF project is a contribution to the operationalisation of the Pungwe Agreement signed by both parties, and in particular:

- Article 12 regarding measurements of water quantity and quality, that the GEF project will concretize with the installation of hydromet monitoring stations (Activity 1.1) and the water uses knowledge development (Activity 3.1).
- Article 13 about *"regular exchange of data and information"* to which Activity 1.2 will contribute,
- Article 14 about "*drought and floods management"*, focus of Components 1 and 2.
- Article 17 about "flow regimes" that underlines the need to "*ensure water of sufficient quantity with acceptable quality to sustain the watercourse and its associated ecosystems"* which is precisely the purpose of activities 2.3 to 2.5.

Alignment with the National Water Policies

The Mozambican national Water Policy defines the main policies as follows: "*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 National Water Policy further recognizes the particular pressure undergone by shared river basins (1.2.c), and emphasizes the need for water for environmental protection (1.2.d), to reduce vulnerability to floods and droughts (1.2.e), and to promote peace & regional integration through joint water management in shared basins (1.2.f). The GEF project is fully coherent with this framework, and almost all activities of the GEF project echo to specific dispositions of the policy. For instance, the Policy prescribes the use of IWRM approach, including the guarantee of environmental flows (4) that are operationalized by Activity 2.3. For droughts and floods management (5), it also plans to develop flood mapping (Activity 1.3) or the development of plans for restriction of use in shared basins (Activity 2.6). It also promotes the development of joint initiatives in shared basins.

Drought management and transboundary watercourses management are listed as the top priorities of the Zimbabwean National Water Policy (Minister's Foreword*)."The policy acknowledges the principles of IWRM (6.3). The Environment is considered a legitimate and important user of water (environmental protection is the 4th objective out of 8 - 6.2). « therefore sufficient quantity of water of adequate quality will be allocated to meet the requirements riverine and aquatic eco systems, wildlife, wetlands, bird life etc, based on sound professional assessment" although their allocations come after other uses'. Water allocation "shall include*

environmental flows, followed by regular monitoring by Catchment and Sub-Catchment Councils. *Environmental requirements sufficient to sustain essential environmental functions will be determined scientifically, reserved and included in all water plans, permit applications and permit approvals"*. Pollution control is also listed among the Priority Policy directives and Policy Principles (6.10). Component 2 activities are perfectly coherent with these priorities. The Policy also promotes ecosystems and wetlands "measures that protect high-value ecosystems such as wetlands, together with the management and control of erosion and high risk flood areas (7.6.6), to which Components 1&2 will contribute.

4.6.2 Project alignment with risk management policies

The 1st principle of the 1999 risk management policy in Mozambique emphasizes the role of communities in planning programming and implementing disaster management activities, which is the aim of activity 1.4. It also recommends (IVc) the preparation of sector plans for each kind of disaster, including droughts and floods, which corresponds to activities 1.3 and 1.4 of the GEF project. The governance setup created, namely the INGC, will be a key partner in the national project steering instances.

4.6.3 Project alignment with climate change strategies

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. The two first priorities (among 8 concerns) are: i) Adaptation and climate risk management; ii) Water resources, which gives important emphasis to GEF Project's Component 1. In particular, as established in the National Climate Change Adaptation and Mitigation Strategy (NCCAMS) (MICOA, 2012), the national priority is defined in its mission as follows : *"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 is also in line with the Zimbabwe INDC, 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 1.5°C. The global climate target is to prevent dangerous anthropogenic interference with the climate system 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.

4.6.4 Project alignment with environmental policies

Alignment with Ramsar Convention commitments

The two countries are signatories to the Ramsar Convention. This intergovernmental treaty 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 was adopted in Zimbabwe on 3 May 2013. Zimbabwe currently has seven 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 two 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 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 the ecosystem-based management, the project will promote principles of the Ramsar convention.

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 and considers 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.

4.6.5 Project alignment with development policies

Alignment with Sustainable Development Goals

The project will contribute towards attainment of the sustainable development goals by the two partner states. For 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 restoring 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 RISDP

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 cross-sectoral 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

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.

4.7 Project alignment with IUCN Programme

IUCN's mission is "To influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable." In doing so, IUCN envisions "A just world that values and conserves nature". It has been operating this through quadrennial programming. The IUCN's programs for 2013-2016 and 2017-2020 are focusing on: (i) expanding efforts to halt the loss of biodiversity and link-up with efforts for poverty reduction and sustainable development; (ii) developing and promoting nature-based solutions to global, regional and local development challenges, providing tangible livelihood benefits and conserving biodiversity and (iii) supporting and influencing the implementation of the Strategic Action Plan of the Convention of Biological Diversity and the Sustainable Development Goals.

IUCN work is organized around three programme areas: Valuing and conserving nature; effective and equitable governance of nature's use and Deploying nature-based solutions to global challenges in climate, food and development. These areas contribute directly to four SDGs programmatic packages, namely, (i) Poverty reduction (ii) food security, (iii) climate action; (iv) land degradation and (v) water security. **This project contributes directly to programmatic package (v) on water security.**

IUCN implements this package through three business lines: (i) **Water governance** which integrates policies, laws and institutional change needed for sustainable management of water resources and conservation of freshwater biodiversity, and **water diplomacy** which strengthens negotiation of agreements at all levels and improved transboundary cooperation in water management; (ii) **Implementing Sustainable Basin Management for Ecosystem Conservation** which includes Implementation of sustainable water resource management and wetlands to conserve and restore ecosystems and secure water-related ecosystem services for water supplies, sustainable economic development and climate change resilience; and (iii) **Investing in Natural Infrastructure**. That is, increasing investment in ecosystems, including wetlands and terrestrial ecosystems in watersheds, as natural water infrastructure for water storage, regulation and filtration for climate change adaptation and water security.

IUCN is already implementing a project (Building River Dialogue and Governance (BRIDGE 3: 2015 - 2018) in PUBUSA covering the three business lines. This project is specifically aimed at upscaling and expanding the impact of BRIDGE in PUBUSA. BRIDGE 4 (2019 – 2021), will complement components 3 and 4 of the current project by assessing ecosystems services values of the basin, based on the values, design the basin's conservation fund mobilisation and use the fund to jointly conserve the basin. This will, among other things, also minimise the source to sea pollution which has been identified as a problem in the catchment.

IUCN Water Program consists of Global and regional programs. While this project will be implemented by ESARO Water Program, under the leadership of the Technical Coordinator of ESARO Water Program, it will receive overall technical oversight from the Global Regional Water Program Director. It will also benefit from technical support by the Global Ecosystem Management Programme of IUCN, which works closely with the Water Programme. As such, IUCN is well positioned and has adequate capacity to facilitate and coordinate implementation of this project.

4.8 Project coordination with ongoing regional/national projects

After the Cyclone Idai disaster that affected most of the basin, a lot of development attention is now focusing on the landscape. Funding of close to USD100 million is coming from the World Bank, African Development Bank and other donors for the Idai Recovery Project (IRP) to Zimbabwe, with a higher amount for Mozambique, focusing on mitigating the impact of

Cyclone Idai on the most affected communities, including restoring livelihood and infrastructure in areas most hit by the disaster in 2019. As this project will be implemented during the ZIRP activities, the synergistic approach will be used, coordinated by the national governments who host the IRP and are part of this project.

In Zimbabwe, the National Water Resources Masterplan Project will use its identified priority areas to consolidate the results from this project and demonstrate its impacts. Precisely, the building of capacity in basin agencies and strengthening of water cooperation, long standing areas in need of intervention, will use this project to achieve some identified targets. The Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway (SECA) Project, which will be concluded in 2020, will also contribute its findings as lessons learnt for the implementation of component 1 activities on drought and flood resilience.

The Building River Dialogue and Governance Phase 4 (IUCN), which co-finance the implementation of some project activities. As an IUCN-implemented project, BRIDGE's component on enhancing capacity to value shared natural water infrastructure/assets will be implemented in tandem with Component 2 of this project. The BRIDGE component on strengthening legal and policy provisions for joint conservation will be coordinated to coincide with Component 3 in order to provide dialogue platforms for effective project implementation.

The SADC-GMI's Sustainable Groundwater Management in SADC Member States Project, which focused on institutional development, capacity strengthening and planning generated important results that can inform the conjunctive management activities in Component 3. SADC-GMI is envisaged to play a role in the project execution, where their expertise will also contribute to the design of the tri-basin institution and the development of the SAP. SADC-GMI will work with the GWP, the executing agency, in delivering their tasks.

The Transboundary Water Resources Management Programme for Africa (GRID-Arendal) which carried out assessments with the SARDC, leading to the publication of Atlases for Lake Victoria Basin, Zambezi River Basin and the Limpopo Basin, also earmarked to execute some tasks in this project. The SARDC will work with GWP under Activity 3.2 to produce a basin atlas for the PUBUSA. The objective here is to communicate the urgency required in addressing these changes in the SAP. Activity will be co-funded by GRID-Arandal and SARDC, and will produce a basin atlas, a story map and outreach activities to disseminate widely the findings of this initiative.

4.9 Incremental cost reasoning

Table 8: Incremental cost reasoning

Business as usual scenario	**Alternative scenario with the GEF resources**
Component 1: Flood and drought warning and mitigation	
The two governments have made efforts to install and sustain **meteorological and hydrological monitoring networks**. With the support of past and on-going projects (Hydromet, SARFFG, for instance), the monitoring networks are in place in	Component 1 is organized to strengthen meteorological and hydrological data collection, treatment and processing for modelling, decision –support tool development and disaster risk reduction purposes in the three basins.

Business as usual scenario	**Alternative scenario with the GEF resources**
both national parts of the basins. They however present some weaknesses: Lack of sustainability of installed stations, such as vandalism, maintenance, robustness of the equipment), Lack of real-time transmission, Low density. These weaknesses prevent the full operation of hydrological tools developed by research institutions such as COSMO, WRF models and a high performance computer at the University of Zimbabwe. Regarding flood modelling and characterisation, the SADC proposes weather forecast products for meteorological early warning. The Zimbabwe has already worked on downscaling these products and local area models have been developed for the whole country (COSMO-WRF). The University of Zimbabwe has purchased a high performance computer (currently under maintenance) that is planned to be used for improving performance of meteorological forecast. The SARFFG (South African Reference Flash Forecasting Guidance) is a platform installed in South Africa that SADC countries can utilize to forecast flash floods. It is operational for Zimbabwe and in Mozambique, it is still ongoing a testing and operationalization period. In Mozambique, district-level flood mapping is currently on going under the supervision of INGC. Despite these developments and other initiatives based on GIS and topographic analyses in the Limpopo and Zambezi basins, especially in Zimbabwe, no relevant real time flood-forecasting model is currently operational at basin scale for the Pungwe-Buzi-Save basins. Regarding flood-early warning systems, the RCT-RANET project support in Mozambique and Datawin is now used on annual basis in Pemba and Quelimane but access of the key stakeholders to the data is not systematic and these activities may stop in 2019 With the support of BMZ-DFID funding and technical assistance of GIZ to SADC Secretariat, community-based systems were developed in the Limpopo basin and replicated in the Buzi Basin. Former initiatives in Mozambique supported by the German cooperation have contributed to the establishment of an advanced locally run Community Early Warning Systems (SIDPABB) for the Buzi river. With the success of this model, a SIDPARS has been established for the Save river, which needs to be consolidated to gain efficiency. In the Pungwe basin, there is a	The intervention strategy integrates the strengthening of the monitoring networks in the Pungwe, Save and Buzi basins. The stations to be renovated shall densify the network and enable efficient data exchange. The intervention strategy shall capitalize on the Hydromet project results and on the existing tools, notably in the other transboundary basins (Limpopo, Zambezi). Specifically, the project will work with the local communities to further expand community based flood early-warning systems. The tangible results obtained through this approach by the GIZ project in Buzi Basin and by national initiatives argue for its replication or strengthening in the other flood-prone basins in Mozambique and Zimbabwe, and especially in the shared Pungwe and Save basins. In addition, the project shall strengthen the capacities of the key stakeholders to the equipment and tools, to the integrated management of floods and droughts, including data and information sharing procedures at transboundary level during floods/droughts seasons. Under this scenario, stakeholders, including vulnerable groups / local communities, will have improved means to coordinate, manage floods and droughts and mitigate related risks in the three basins. They will also be empowered to undertake this responsibility. The overall impact will be a reduction in the vulnerability to floods and droughts and in damages.

Business as usual scenario	**Alternative scenario with the GEF resources**
formal early warning system operated by ARA-Centro on the one hand, and Local Committees for Disaster Management (CLGC), but the decentralized community-based system is not yet operational and articulated with the administrative system. For instance, the ARA staff gauge reader is not part of the CLGC. In Zimbabwe, community flood management relies on community-based disaster risk management (CBDRM) trainings at ward level through the ward disaster risk management committee. Participants that are drawn from the Ward Development Committee draft a disaster risk management plan. There is an operational Manual for Management of Flood Emergencies that is used by district Civil Protection committees (in flood prone areas) and is complemented by DRM plans with details on mitigation aspects. In Zimbabwe, DRM capacity needs were assessed by the CADRI initiative.	
Co-financing: - Climate Resilient Infrastructure Development Facility (CRIDF/DFID-UKaid) projects, **Co-financing USD 2,770,000;** - Building climate resilience of vulnerable agricultural livelihoods in Southern Africa Overall Budget USD 33,388,272. - Command Water Harvesting (Water Fund), **Co-financing USD 2,000,000**; - Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway (SECA) Project (2016-2020) **Co-financing USD 33,175,000.**	GEF funds: - USD 2,207,850
Component 2: Conserving and restoring ecosystems for sustainable livelihoods	
Ecosystems and ecosystems services conservation is one of the core concerns of quantitative water management, though quite difficult to implement as priority is often given to formal water uses. The environmental flows implementation is unanimously considered as a priority by both Mozambican and Zimbabwean partners. The PP2 initially planned to explore and operationalize this concept, but it was finally left aside. Though jointly agreed that e-flows are a crucial element in quantitative transboundary water management, limited information can be found on ecosystems and their water needs characterization. An assessment is needed at the 3 basins scale relying on research centres and	Though conceptually easy to understand, e-flows appeal to be quite complex developments, and the awareness of what e-flows can and cannot bring to IWRM is not widespread. However, as in any transboundary basin, environmental flows are a cornerstone of cross-border allocation and water sharing decisions.

Business as usual scenario	**Alternative scenario with the GEF resources**
Universities expertise together with provincial and district administrations field knowledge. Currently, dams liable to have transboundary impact have to observe e-flows requirements that are determined statistically. The BRIDGE initiative, piloted by the IUCN, implemented e-flow training sessions. Lack of capacity was identified as a major constraint to improve the transboundary managements of the shared water resources in both countries. Thus, the aim of the initiative was the development of capacity to assess and manage environmental flows. The IUCN collaborated with Waternet, a SADC subsidiary institution mandated to develop capacity on integrated water resources management in the region. Waternet delivered in 2015 and 2016 two modules to participants responsible for planning and managing the shared river basins in Mozambique and Zimbabwe: Module 1: Principles of Environmental Flows; Module 2: Environmental flows - from Theory to practice. A third Module - Determination of environmental flows for basin planning - is to be organized between September and December 2018. BRIDGE 4 is to strengthen these As to water quality assessment of the 3 basins, available data and information is gathered in the 3 Monographs. 5 sites are currently monitored on a regular basis, based on PP2 support. However, limited information is available on heavy metals pollution, which is one of the core concerns regarding water pollution.	Component 2 will facilitate the definition of 'objective' flows in strategic points relying both on e-flows determination (flows to feed ecosystems) and allocation (e-flows + flows to feed downstream uses). This process requires necessary steps that will strengthen the knowledge and understanding of the ecosystems and development a management framework to cope with droughts and competing uses. Under this scenario, key ecosystems connected to rivers (aquatic, wetlands, brackish and groundwater), and of their water needs will be identified and characterized to enable the determination of e-flows in a range of "hotspot" ecosystems, and typical aquatic habitats. The pilot-testing of conjunctive management of ground and surface water will broaden the understanding of the ecosystem. Based on the existing tools (such as CRIDF's), allocation models will be further developed and refined to ease the definition of objective flows in strategic points including both anthropic needs (water uses) and ecological needs (e-flows). In parallel, practical guidelines for transboundary quantitative water management (including e-flows), specific to the 3 transboundary basins will be established and jointly adopted. These guidelines will be operationalized with the determination of e-flows, in a set of point complementary to BRIDGE's. The set of e-flows determined (including BRIDGE's) will be injected in the allocation model to support allocation decision, particularly for transboundary flows. The intervention strategy shall ensure the implementation of the above water management practices and objective flows. In that sense, the project will support the countries in the endorsement process of the objective flow values in the strategic points, and rules for computing these values elsewhere. Legal texts, such as transboundary framework (for transboundary water sharing) and national frameworks (for water sharing among uses, including the environment) will be established and implemented.
Co-financing: - Climate Resilient Infrastructure development facility (CRIDF/DFID-UKaid) projects, **Co-financing USD 2,770,000;** - Building River Dialogue and Governance Phase 4 (IUCN), **Co-financing USD 531,426**	GEF funds: USD 1,485,700
Component 3: Integrated basin planning for the Pungwe-Buzi-Save river basins	

Business as usual scenario	**Alternative scenario with the GEF resources**
Governance strengthening for integrated transboundary water management of the Pungwe-Buzi-Save basins is on its way, with the support of the GIZ for the establishment and adoption of Buzi and Save agreements, and the common wish to establish a tri-basin organisation. To effectively manage water resources in the three basin, the future tri-basin needs to develop strategic documents and identify a list of priority actions. 3 monographs and associated SAP have been developed for the 3 basins (November 2006 for Pungwe, October 2011 for Buzi and December 2011 for Save) and are considered as reference documents. But they need to be updated. The Monographs had already carried an assessment of the water uses in the perspective of establishing the water balance, which update is now needed, particularly regarding water demand. In Zimbabwe, within the CRIDF-funded project, specific data verification, collection and upgrading task for all water permits for the Save Basin is scheduled for completion by end of September 2018. In Mozambique, ARA-Centro processed all water permit application. These databases do not cover the whole project area, and lack information about the effective use of water (effective quantity abstracted, characterisation of the use such as the irrigated area and crops). In addition, under the usual scenario, the JWC has not harmonized these documents and on-going projects have not provisioned for the development of such operational tools.	This Component aims at diagnosing the core concerns of the 3 basins and establishing a strategic planning, that has the ambition to become the roadmap for the future tri-basin organisation. The TDA/SAP strategic documents, promoted by GEF IW good practices will be developed. The project will not start from scratch as 3 monographs and associated SAP have been developed for the 3 basins. Update will also come from national investigations such as Save and Runde Catchments River Outline Plans or National Water Resources Masterplan. Coastal challenges identified in the CRCC and influenced by the 3 basins will be integrated in the TDA. The SAP elaboration will enable one further step in the bilateral cooperation construction with the joint basins planning that may be used as a strategy for the future tri-basin institution that the GIZ project will contribute to establishing. The TDA/SAP development strategy will include training of national technical teams and their hands-on involvement in the drafting process. This activity will aso see the incorporation of groundwater into cooperative arrangements overseen by the JWC. To complement the baseline, an assessment of current and projected water uses in the three basins will be conducted. Finally, under this scenario, the two countries shall be in position to implement the strategic action prioritized in their strategic documents, as resource mobilization strategy will be drafted and implemented in the frame of Component 3.
Co-financing: - Transboundary Water Resources Management Programme for Africa (GRID-Arendal, USD 200,000) - Save and Runde Catchments River Outline Plans, **Co-financing USD 200,000;** - National Water Resources Masterplan Project, **Co-financing USD 2,900,000;**	GEF funds: USD 1,972,575

Incremental cost matrix

The following incremental cost matrix only presents the confirmed co-financing.

Table 11. Incremental cost matrix

Costs	Baseline Costs (USD)	Alternative Scenario Costs (USD)	Incremental costs(USD)
Component 1: Flood and drought warning and mitigation			
CRIDF/DFID-UKaid	USD 1,385,000	USD 1,385,000	
Water Fund Zim	USD 2,000,000	USD 2,000,000	
GEF funds		USD 2,842,950	USD 2,842,950
Component 2: Conserving and restoring ecosystems for sustainable livelihoods			
IUCN BRIDGE P4	USD 531,426	USD 531,426	
CRIDF/DFID-UKaid	USD 1,385,000	USD 1,385,000	
SECA Zim	USD 33,175,000	USD33,175,000	
GEF funds		USD 1,509,700	USD 1,509,700
Component 3: Integrated basin planning for the Pungwe-Buzi-Save river basins			
GRID-Arendal	USD 200,000	USD 200,000	
Save and Runde Plans Zim	USD 200,000	USD 200,000	
NWRM Project Zim	USD 2,900,000	USD 2,900,000	
GEF funds		USD 1,313,475	USD 1,313,475
Project management costs			
GEF funds		USD 880,875	USD 333,875
Total (US$)	***USD 42,306,426***	***USD 48,306,426***	***USD 6,000,000***

As prescribed by the PIF, the whole project budget falls under the **Technical Assistance** financing type. Table 12 below shows the distribution of the project budget according to the three technical discussed in Section 4.3, and in Table 13, a full inventory of the identified co-financing is listed according to the focal area supported.

Table 12. Distribution of the project budget by focal areas (IW) and programs

USD	IW1	IW2P3	IW2P4	Total
Comp1	1 895 300		947 650	2 842 950
Comp2			1 509 700	1 509 700

Comp3		1 313 475		1 313 475
PMC	131 157	51 417	151 301	333 875
Total	2 026 457	1 364 892	2 608 651	6 000 000

Table 13. Co-financing

USD	**Comp1**	**Comp2**	**Comp3**	**PMC**	**Total**
IUCN (BRIDGE P4)		531 426			531 426
CRIDF/DFID-UKaid	1 385 000	1 385 000			2 770 000
GRID-Arendal (Norway)			200 000		200 000
Save and Runde Plans Zim			200 000		200 000
NWRD Project (World Bank) Zim			2 900 000		2 900 000
Water Fund Zim	2 000 000				2 000 000
SECA Zim		33 175 000			33 175 000
Zimbabwe (in-kind)				530 000	530 000
Total	**3 385 000**	**35 091 426**	**3 300 000**	**530 000**	**42 306 426**

4.10 Sustainability

Sustainability refers to the probability of continuation of project-derived benefits and impacts (i.e., institutional, environmental, social, economic and financial) beyond the project. In order to achieve sustainability, the project approach relies on: (i) the development of transboundary cooperation tools, (ii) the implementation of a community-driven approach, (iii) the integration of economic considerations, (iv) capacity-building, (v) improving knowledge management, and (vi) a strong national framework and commitment from stakeholders.

4.10.1 Financial and economic sustainability

The likely risk to sustainability of the project is the financial strain initiated by the vulnerability of the national economies to global events. Financial stress reduces the ability of the states to sustain needed levels of counterpart funding and reduces the likelihood of countries to assume the increased financial burden upon completion of GEF funding.

One key intervention contributing to project sustainability and the transferable sustainability of the GEF contribution will be the sites activities and their replicability throughout other pilot sites and other transboundary basins in Southern Africa / SADC region. As such, one of the key criteria is a clear definition within the proposal of the potential for replicability of the lessons learnt and the best practices developed from the site activities. These on-site activities are consistent with the TDA/SAP development process. Significant additional inputs will be required to ensure that the lessons learned are transferred from one area to another in the SADC area and this will require considerable government commitment of manpower and financial resources.

The Project will demonstrate in a replicable manner, integrated water management strategies. The demonstrations will stress the development of cross-sectoral management approaches, which will address the requirements for institutional realignment and appropriate infrastructure; adoption of new modalities for sectoral participation; enhancement of regional capacity to manage the basin in a sustainable manner; linkages to the social and economic root causes of environmental degradation; and the overall need for sustainability.

Finally, to ensure the sustainability of the main project outputs (especially the SAP), a financial mobilisation strategy will be developed to cover the funding needs of the prioritized actions of the SAP (Activity 3.7). This strategy will be used by the future tri-basin institution as a tool to advocate the support of their partners for the sustainable management of the transboundary ecosystems in the 3 transboundary basins. This will be complemented by continuous coordination with key bilateral and multi-lateral donors and roundtable to collect funding commitments. A resource mobilization roadmap will be developed based on an international donor's conference (or forum, or round-tables) and on communication in regional events related to international waters and biodiversity. Based on the approved financial resources mobilisation strategy, the JWC, national/regional executing agencies and future Tri-Basin Institution shall use these tools to leverage funding to sustain the present project outputs.

4.10.2 Institutional sustainability

The sustainability of the project has been addressed since the early stage of this project preparation, by engaging with the major stakeholders in all aspects of project design. An intense consultative process has been undertaken. It was based on an inception mission, a scoping mission including field visits in both countries and a validation workshop.

The proposed interventions were selected on the basis of how easy it will be for administrations to sustain them, with the same considerations for communities when relevant. The interventions are aligned with the national priorities of each country. The high political commitment shown by the governments so far in the project development process is a fair indication of their continued interest and support. The long-term success of the project will be ensured by the confirmed political will of participating governments to cooperate and sustain project interventions and outputs at project termination. The strong relationship between government institutions and the executing agency, as well as supporting organizations, will also contribute to sustaining project interventions and outputs. In particular, the executing agency –GWP – already has a similar role in the BMZ/DFID project for sustaining water governance in the same basins.

The project will employ a community-driven, participatory approach to establish decentralized disaster risk management systems. The project will also support communities throughout the process to establish more sustainable ecosystem management, including the elaboration of environmental flows regulations. It will also invest heavily in building the capacity of stakeholders and communities to establish and implement the management systems and practices, building their experience in negotiating with stakeholders, formulating action plans, applying new practices, monitoring and managing small projects and funds. The project's strategic approach and interventions were selected because of both their demonstrated ability to deliver results and their ability to be owned and sustained by local stakeholders. At the regional and national levels, institutions will be strengthened by involving them in the project and establishing a system for management of knowledge on wetlands and ecosystems.

Capacity building is an essential link in project sustainability: a right balance has to be found between technical developments and capacity building. For each component, special focus is given to capacity building, at different levels:

- Co-development of tools and on-the-job training for tools administrators (particularly for Component 1),
- Training sessions for tools users (particularly for Component 1),
- Training sessions prior to project activities to give stakeholders the means to participate actively (particularly for Component 3 and activity 1.5), which also guarantees their future commitment,
- Sensitization sessions (particularly for component 2).

The planned community-based approach and public awareness interventions shall contribute to build the local community ownership of the project and pave of the way for a continuous support.

During the project, the PMU will look at strategies for developing and refining the legal, institutional and financial needs for the River Basin Organization (RBO). At project closure, the PMU will cease to exist, but its foundations would have laid the ground for a tri-basin RBO to take effect. Independent of this project, the riparians are already in discussions about establishing an RBO, and have already agreed that it will be hosted by Mozambique in Beira, with financial contributions from the riparians funding the operational budget. The project will therefore strive to support this initiative by building capacity in the PMU, deliberately designed to benefit the RBO when it comes into existence. Agreements will be sought to ascertain that staff, equipment and operational procedures secured in the PMU will, wherever possible, be taken up by the incoming RBO to promote continuity. However, the establishment of the RBO is a political process that the project has no control over, and as such, there may be a gap between project closure and the establishment of the RBO

4.11 Replication

The Project potential for successful replication and reoccurrence, within the three basins and to other international water resources in Mozambique and Zimbabwe is high both at the regional, national, and local levels. It is built around capacity development of the agencies in charge of water resources management in the participating countries. The project shall also support the baseline project aiming at paving the way towards the establishment of a tri-basin PUBUSA Institution that will hold a regional mandate to strengthen integration among the country members. At the national level, sites have been selected to facilitated cross-border learning processes among local communities. Particularly, this project intends to disseminate best practices lessons related to production sectors that threaten the wetlands ecosystem, and to develop capacities for using those best practices.

At the regional level, the SADC Water Division, whose mandate is to promote regional best practices and institutional development in terms of transboundary water resources management, also targets the JWC and the future tri-basin institution. Through capacity development of the JWC members to prepare and adopt the TDA and SAP for the protection of international waters and biodiversity, the replication of the project achievements will be taken further as the JWC becomes an established institution. Lessons learned on the transboundary water resources will be transferred to other basins in SADC area through the connection with the SADC Water Division.

Finally, a number of initiatives are on-going in the three basins and the implementing partners were approached for possible collaboration. The project will promote and facilitate, through a regional forum, the exchange of experiences, and best practices in other GEF international waters projects and other comparable projects in Southern Africa.

4.12 Communication and knowledge management

Communication and knowledge management has been addressed in every proposed activity, which at least incorporates budget items for information sharing. In addition, the following activities specifically address communication and knowledge management concerns:

- Activity 3.6 will focus on the preparation and dissemination of IW LEARN Information products. Knowledge-sharing tools and networking platforms will be developed for the exchange of environmental data and information and lessons learned from all relevant projects in the region at national, sub-regional and regional levels including web-based informational packages, the IWLEARN database, newsletters, etc. The project will connect with the GEF IW-LEARN programme that promotes experience sharing and learning among GEF International Waters projects.
- Activity 3.5 will populate the Transboundary Freshwater Dispute Database, developed and maintained by the Oregon State University College of Earth, Ocean, and Atmospheric Sciences. A regional task team with IUCN ESARO shall also contribute to support communication and promotion of the project achievements.
- A Communication expert will be hired to develop the communication strategy of the project and to implement communication-orientated activities.

More generally, communication is more than ever among the core business at IUCN from global to regional and country levels. It entails internal and external project aspects. For a relatively complex regional project involving national and regional coordination, internal communication will be key in removing misunderstanding and fostering genuine collaboration among the executing and implementation agencies. It has been highlighted during project preparation that good communication on the project, its stakeholders and their respective role would result in smooth management of and effective delivery of the project at both country and regional levels. Therefore, internal communication aims at strengthening collaboration among partner's organisations of the project. Regular contacts will be established between IUCN, the implementing agency and the executing agencies at the regional (JWC members, GWP) and countries (Mozambique and Zimbabwe) level. The content of such communication will include information regarding the project, its progress towards the objective, and constraints related to the proper execution and or implementation of the project. IUCN will also encourage communication across country teams to exchange information pertaining at improving the delivery of the project in all countries.

Regarding external communication and visibility, full compliance with IUCN and the GEF branding guidelines will be required. Among other, these guidelines describe when and how to use IUCN and GEF logos. These documents can be accessed at https://www.thegef.org/gef/policies_guidelines/communication_visibility for the GEF, and at https://cmsdata.iucn.org/downloads/iucn_publishing_guidelines_131210.pdf for IUCN. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied. External communication has to deal with project publications, vehicles, supplies and other project equipment.

Likewise the communication, knowledge management will entail internal and external processes:

- Internal processes: how the project systematically collects, archives and retrieves the knowledge of its staff and how it manages internal communications among its staff in order to strengthen its knowledge base.
- External processes: how the project shares its knowledge with the people that needs to use the knowledge, how the intervention strengthens its knowledge through its interaction with external groups and how it identifies whether its insights have made a difference.

Knowledge management will be strongly linked to the project monitoring and evaluation outputs to ensure that all collected M&E data are processed into knowledge and shared with the project staff through the most appropriate communication tools, such as mailing list, the project meetings and workshops. The objectives of this internal knowledge management process are twofold (i) getting the preliminary knowledge on the project delivery right to the main stakeholders and (ii) improving this knowledge with individual know-how. This enriched operational knowledge through internal processes will serve as inputs to the external processes of knowledge management. External knowledge management will be geared towards outreaching the project achievements and lessons to external partners at local, national, regional and international levels.

4.13 Environmental and social safeguards

The project was screened on environmental and social risks at an early stage of project development, according to IUCN procedure; the Screening Report in Appendix 5 summarizes the findings of this process. The conclusion of the screening is that the project will generate highly positive social and environmental benefits. Despite this expectation, a few social risks were identified. These risks were described as readily being able to be addressed by the project during the design phase. The environmental impacts were found to be almost exclusively positive, with one minor risk associated with invasive species. This risk was

addressed in the project design. Finally, the screening found the risk of the project failing to address the impacts from climate change to be low given the project's explicit objective to improve resilience and reduce vulnerability to climate change. Overall, the risks identified were considered as minor/and or readily addressed and the project was classified as a low risk project.

The classification was to be further informed by a more detailed examination during the PPG phase, when analyzing the environmental and socio-economic context at the selected sites. Based on the findings from the PPG field mission and taking the final project design into consideration, the project does not trigger any of the following standards. Conclusions and recommendations on environmental and social risks drawn following this process are available in Appendix 5.

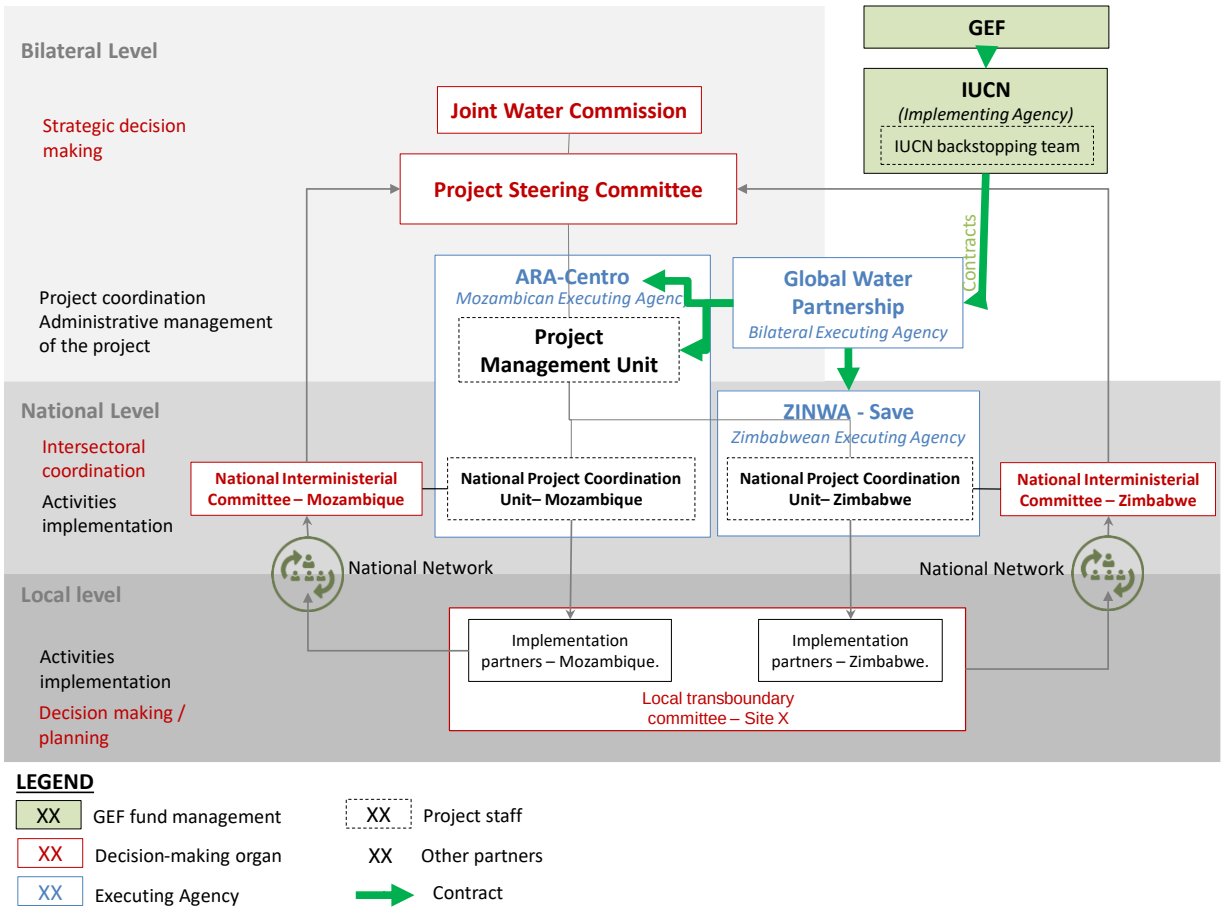
5 Institutional Framework and Implementation Arrangements

The project will be will be implemented at two levels:

- Overall Programme coordination, implementation and oversight at bilateral multi country level.
- Implementation at Country level.

The proposed institutional set-up to implement the project activities is depicted in the organisational flow hereunder.

Figure 10 : Proposed institutional setup for project implementation



5.1 At Bilateral Level

5.1.1 Decision making and planning: the JWC and the PSC

The Joint Water Commission (JWC), apex decision-making

The apex decision-making organ shall be the Joint Water Commission, in charge of strategic orientation of the project. This institution is currently the bilateral institution cooperation for water issues between Mozambique and Zimbabwe, and composed of highest level decision makers. The project will take the opportunity of its meetings to solicit its members for the project overall orientation.

The Project Steering Committee (PSC), orientation of the project

The project will set up a regional task force to assist in facilitating the project implementation in the two countries. The PSC will serve as the bilateral advisor for overall project activities implementation. PSC members would include 5 to 6 members in each country:

- High level government representatives from the Line Ministries to chair on a rotational basis;

Ministry of Public Works, Housing and Water Resources (MOPHRH) – DGNRH, in Mozambique,

Ministry of Environment, Water and Climate (MEWC) – Department of Water Resources, in Zimbabwe,

- GEF National Focal persons:

MITADER (Ministry of Environment),

Ministry of Environment, Water and Climate (MEWC) – Department of Environment, in Zimbabwe,

- Representatives from National Executing Agencies (National Focal Points, see below):

ARA-Centro in Mozambique,

ZINWA Save in Zimbabwe,

- Representatives from other key public administrations

INGC in Mozambique,

ZINWA Runde in Zimbabwe,

- Stakeholders representatives (1 in each country)
- 1 non-permanent member to be invited upon the main issues to be dealt with.
- The Tri-Basin River Organisation Secretariat once it is formed.
- A senior manager from the bilateral executing agency
- Regional or local NGOs and the private sector will be invited to have observers. IUCN will also participate as an observer. The Project Coordinator (PMU) will represent the Secretariat.

The finalized list of Task force members will be completed during the project inception phase, no later than 3 months after the start. The PSC will meet annually to monitor past progress in project execution, and to review and approve annual work plans and budget. Key members will meet as per need for activity specific guidance.

Its overall role will consist of project orientation. More specifically, it will:

- Advise the Project Management Unit;
- Monitor Project progress and take timely actions to resolve implementation constraints;
- Liaise with different National Project Units within the riparian countries to ensure that the Project Management Unit (PMU) and National Projects Coordination Units (NPU) act in harmony;
- Review annual substantive and financial reports on project activities;
- Review and approve annual work plans;
- Review monitoring and evaluation of project activities;
- Ensure project coherence with other basin-wide or nationally run projects.

5.1.2 The IUCN, Implementing Agency

Overall role of IUCN as implementing Agency

IUCN is the implementing agency for the Project, and will manage the project funds on behalf of the GEF.

IUCN, in its role of the project-implementing agency, will support the Executing Agency to ensure execution of administrative and financial matters and will assist in key technical and scientific issues as per the request of Governments through their selected Executing Agency. Wherever possible, the project will take advantage of the opportunities for synergy and complementarities with other project or other GEF Agencies. Specifically, it will be responsible for the following tasks:

- Supervise project implementation
- Monitor and evaluate project performance, prepare implementation review;
- Provide technical backstopping to executing agencies at national and regional level;
- Ensure quality control of the project work plans, budget and reports.

Within IUCN internal organization:

- IUCN Headquarters is responsible for the overall performance of the project to the GEF secretariat and ensure all the contractual obligations are met ;
- IUCN ESARO will provide oversight, ensuring all the programme delivery and performance, including financial accountability;
- IUCN global programmes directors can provide backstopping such as an annual technical overlook of this project implementation, in addition to ESARO's oversight roles;
- IUCN country office will have a facilitation role and participate in meetings as observers.

5.1.3 Regional task team

IUCN, as the implementing agency, will designate internally a **Regional Task Team**, composed of adequate thematic experts, in charge of supervision and backstopping. These experts will provide backstopping to the PMU and NPU to ensure effective implementation of the project at regional and national level. The role of the backstopping team is:

- Supervise contract issuance for the main experts of the PMU and NPU;
- Provide technical guidance to regional and national project management Units for the annual work plan and budget preparation;
- Ensure proper M&E and communication of the project achievements;
- Ensure proper financial management and reporting of the project resources;
- Ensure fluid communication between the executing and implementing agencies;
- Ensure compliance with GEF and IUCN project management procedures and standards.

5.1.4 GWP overall role as Bilateral Executing Agency

If it was created, the tri-basin river organisation would be the ideal Bilateral Executing Agency. However, in its absence, it is proposed that the Global Water Partnership assumes the role of Bilateral Executing Agency. For this purpose, a contract will be signed between IUCN and the Bilateral Executing Agency.

GWP will be responsible for technical leadership, including the design of methodological approaches (such as baselines, trainings, capacity building and technical back up support). It will also support scaling policy influencing and advocacy.

Its core function will be the facilitation of the project activities through the recruitment of dedicated staff in a Project Management Unit (see next paragraph). It will be supported by partner government agencies (National Executing Agencies**)**, for project activities implementation.

The Bilateral Executing Agency will ensure close coordination and harmonization with other on-going projects, especially ensuring information exchange and coordination within the context of the TDA and SAP development activities. In close collaboration with the IUCN, the Bilateral Executing Agency will undertake the:

- Recruitment and contracting of project staff, including the Project Management Unit (PMU);
- Management of PMU and NPU staff ;
- Financial Control and management of project budget and expenditures;
- Management of sub-contracts;
- Contribution to training;
- Procurement of equipment;
- Periodic reporting to UICN as required;
- Provision of miscellaneous component;

Administrative, accounting, financial and auditing arrangements will be finalized with IUCN prior to any disbursement:

- Assessment of the financial management system with timetable for any improvements required;
- Agreement with Project Implementing Agency on financial and accounting standards;
- Audit arrangements, to ensure independent audits will be undertaken on an annual basis according to standard Implementing Agency requirements;
- Annual work plan, procurement plan and disbursement plan based on traditional disbursement procedures and best practice.
- All administrative reporting, monitoring and evaluation requirements and procedures as required by the implementing agency.

5.1.5 Project management at bilateral level: the Project Management Unit (PMU)

A Project Management Unit (PMU) will be established for the execution and implementation of the project activities. The PMU will be responsible for the project financial management including the preparation and production of annual financial statements in accordance with internationally acceptable accounting principles as well as making arrangements for financial audits. The PMU will monitor all disbursements and ensure implementation are in line with GEF and IUCN guidelines. A computerized financial management system including the accounting, budgetary, financial, reporting and internal control systems) will be established in the PMU made operational at the outset of project implementation.

The Bilateral Executing Agency (GWP) with the help of the Implementation Agency (IUCN) will establish the PMU. It will be hosted by ARA-Centro in Beira (the National Executing Agency for Mozambique). The PMU will report financially, technically and administratively to the Bilateral Executing Agency (GWP). GWP in turn technically reports to the Project Steering Committee (PSC). It will consist of 3 staff members:

- a Regional Project Coordinator, preferably Zimbabwean to balance the establishment of the PMU in ARA-Centro,
- A finance officer (half time)
- a M&E/communication Specialist (half-time)

Specifically the PMU will be responsible for:

- Elaborating the annual work plan, procurement plans, and budgets, based on contributions of the National Project Units,
- Ensuring proper M&E and communication of the project achievements;
- Ensuring proper financial management and reporting of the project resources;

- Ensuring fluid communication between the executing and implementing agencies;
- Ensuring compliance with GEF and IUCN project management procedures and standards;
- Elaboration of regional work plan and budget from national project management units;
- Preparation of bid document for bilateral activities of the project;
- Procurements for bilateral activities of the project;
- Contracts administration ;
- Consolidation of reports from national project units;

Etc.

The PMU Coordinator will act as the Secretary of the PSC and report to the PSC Chairman

5.2 At national level

The project is owned by the two riparian countries.

5.2.1 Decision making and planning: two National Executing Agencies:

In each country, there will be a lead agency representing the government. The proposed National Executing Agencies are:

- ARA-Centro for Mozambique,
- ZINWA - Save for Zimbabwe.

Other relevant agencies in the countries will give their support to the project through Inter-Ministerial Committee Coordination meetings and actions.

In each country, the National Executing Agency shall designate a high-level representative as National Focal Point for the project. In Zimbabwe, the NFP will come from ZINWA-Save The National Focal Points will help assure intersectoral coordination with their country, as a step towards sustainability. Through the establishment of inter-ministerial dialogue, it is anticipated that wide involvement of many ministries and government departments as stakeholders will be assured. The NFP will represent the National Executing Agency in the PSC meetings at regional level.

5.2.2 Inter-sectoral coordination: National Inter-ministerial Committee (NIC)

The National Executing Agency shall appoint a National Inter-ministerial Committee (NIC) for the project, gathering the different sectorial institutions involved in water, natural disasters and environmental management at national and local levels. The National Focal Point will be the Chair of this duly appointed National Inter-ministerial Committee of the project.

The committee will oversee a national network of educational, research, governmental and non-governmental agencies and organizations, which will be responsible for administering and implementing project activities at national and local levels, according to a common work plan.

The committee and network will work closely to assure that the governments will endorse their work products, but the project will retain some independence in naming individuals to the committees to assure broad representation of stakeholders. During the implementation, governments will be directly involved in the regionally coordinated activities through the participation of national institutions and experts in activities planned under this project. The meetings and work/decision of the National Inter-ministerial Committee will be supported and implemented by a National Project Unit.

5.2.3 Project implementation: National Project Units (NPU)

For the project implementation, the national executing agency in each participating government shall establish a National Project Unit (NPU**)**, located within their offices. The NPU shall report to the National Focal Point chosen by the National Executing Agency. The NPU will work closely with the PMU and Regional Executive Agency, and will be responsible for implementing the Project at national level. The NPU provides a critical link between the PMU, other Project resource persons and the various national specialists, technical services, and organizations involved in implementing the various project components within the respective countries.

Each national Unit will be constituted of 2 staff for project implementation:

- 1 x Technical Advisor, who is an IWRM expert, with high technical, writing, training and communication skills for being able to:

-advise governments on technical issues (hydromet network, early warning, e-flows)

-drafting documents (TDA, SAP, data exchange protocols)

-training on IWRM issues

- 1 x Admin Officer. Accountant (administrative, finance officer, procurement -bilingual).

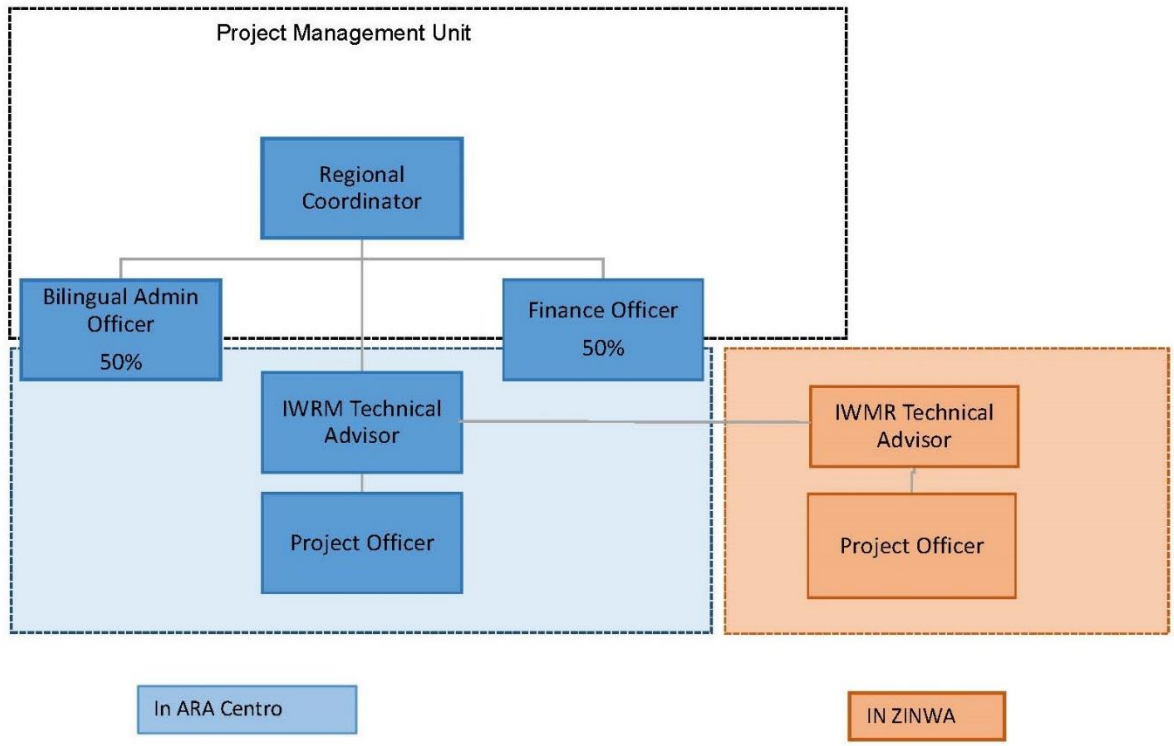
The national executing agency will appoint a National Focal Point (NFP) to lead the NPU, and to undertake all day-to-day interventions, inputs, and communications at the respective national level. The National Project Coordinator will serve as a Secretary to the National Inter-Ministerial Implementation Committee, reporting to the National Focal Point.

The role of the NPU is project coordination:

- Preparation of national work plan and budget;
- Preparation of bid document for national activities of the project, under the supervision of the PMU, and in coordination with the other NPU; Preparation of administrative bid documents for bilateral activities;
- Procurement of activities;
- For project implementation:
- IWRM expertise, and activities implementation (such as TDA/SAP drafting);
- Support to national partners in the implementation of activities;
- Preparation of national component reports.

The planned project management and implementation organogram is the following.

Figure 11: planned project management and implementation organogram is



5.3 Contractual arrangements

IUCN, as implementing agency, will contract the Bilateral Executing Agency that will then subcontract the appropriate staff for:

- the Project Management Unit, in close collaboration with IUCN, for project coordination at transboundary level ;
- the National Project Coordination Units, for project implementation at national level.

5.4 Procurement plan

Procurement will be carried out in accordance with the Policy and Procedure on Procurement of Goods and Services of IUCN of October 2015. This policy aims at ensuring that executing agencies obtains value for money in all its procurement activities and that procurement is conducted in an efficient and cost-effective manner that respects sustainability, the environment and ethical principles. It therefore sets the procurement method depending on the value of Goods or Services, and includes the level of delegation of authority. The following defines procurement categories, methods and thresholds.

Procurement of goods and works: Goods and works comprise materials, supplies and the construction of physical infrastructure. All procurement of goods and works shall be carried out in accordance with the IUCN procurement policy (Table 9).

Procurement of services: Services include those provided by consulting firms or individual consultants (including commission members) educational and research institutions, service companies, and government and nongovernment organizations. All procurement of services shall be carried out in accordance with the IUCN procurement policy (Table 9).

Table 9. Required procurement process for different values

Value	Process	Media
≥ CHF 100,000	Formal Request for Proposal to a broad selection of potential suppliers. Optional formal pre-selection process to reduce number of proposals.	Must be advertised on IUCN website. Resulting award must also be published on IUCN website.
CHF 25,000 – 99,999	Minimum of 3 proposals from identified suitable suppliers	No advertising required
CHF 1 – 24,999	Competitive bidding not essential but should be considered where the benefits of competitive tendering in terms of price and quality will outweigh the costs.	No advertising required

Training Programs, Conferences, Workshops, etc.: All training and workshops will be carried out on the basis of the project's joint work plans and budgets approved by the IUCN, and which will among others, identify: (i) the envisaged training and workshops; (ii) the personnel to be trained; (iii) the institutions which will conduct the training; and (iv) duration of the proposed training.

Operating Costs: Operating Costs include office supplies, operation and maintenance of vehicles, maintenance of equipment, communication, rental, utilities, consumables, transport and accommodation, travel costs and per diem, etc. Operating costs procedures will follow the World Bank Procurement Guidelines.

Project Management Unit: Terms of reference for all full-time positions will be developed in close collaboration between IUCN and the executing agencies.

The procurement plan for good, non-consultant services and consultant services is provided in Appendix 8.

6 Stakeholder engagement and participation

6.1 Stakeholder contribution to the design phase

The project components design process, during the PPG mission, benefited from the contributions of various regional, national and local stakeholders. Regional, national and local stakeholders from the national institutions; the private sector and the civil society were invited to share data and information on the transboundary environmental issues they face. They were also invited to express their needs in terms of capacity building, institutional strengthening and on-the-ground intervention to tackle these issues. Local and national consultations (national meetings in both countries in April 2018, field missions in April 2018 and May 2018, in Mozambique and Zimbabwe respectively) and dedicated work sessions during the regional workshops held in Pretoria, South Africa, 13/02/2018, Beira, Mozambique (07/05/2018) and Mutare, Zimbabwe (12/07/2018) in the framework of the PPG mission were specifically organised to ease this information sharing. A broad range of stakeholders took part to these exercises. The minutes of the consultations are detailed in the project scoping report. The detailed contributions provided during the workshop sessions are available in the workshop reports.

6.2 Stakeholder involvement in the implementation of the project

Technical partners will undertake activities under contractual arrangements. The project will co-ordinate with all the sector initiatives implemented by other agencies in the sub-region. IUCN has initiated discussions at national and regional levels with other development partners on developing an integrated approach to addressing biodiversity conservation and forest ecosystems management in the region.

Successful implementation of the project will depend on the active participation of stakeholders. To assure this, stakeholder involvement is recognized as an integral requirement for each project component. In endorsing the project document, the countries of the region recognize and embrace the need for this direct involvement by all stakeholders in the project process. The primary stakeholders in this project include:

- Public Sector: ministries responsible for water resources management, disaster risk reduction, environment, community development, and education;
- Local government authorities;
- Local community-based decision bodies
- Community-based organizations: groups, cooperatives, associations and Non-Governmental Organizations (NGO): national trusts, conservation associations, women's organizations, organizations of fisher-folk and national and regional organizations representing sedentary crop growers and livestock raisers, pastoralists, etc.
- Local communities: traditional rulers, farmers, fishermen, women, hunters, etc.
- Private Sector: manufacturers/agro industrials (irrigation schemes), hydroelectric dams operators;
- Professionals: researchers, sociologists, environmental managers, engineers (water, civil, environmental), biologists, teachers, curriculum specialists, media practitioners

The following stakeholder engagement strategy indicates how the various stakeholders will be involved, and at what stages. In order to attain sustainability, the activities are designed to address interests of large groups of stakeholders, and a significant portion of the budget is designated for this task.

6.3 Engagement Strategy

The engagement strategy of the project relies on a same 3-step workflow, that shall be implemented whenever stakeholders participation is expected:

Capacity building;

Technical support for an accurate diagnostic;

Consultation and dialogue involving all the stakeholders towards the elaboration and implementation of development strategies, management plans, adaptation measures, or resilience strengthening activities.

Specific roles of each stakeholder

Indicative roles of identified key partners are detailed in the following stakeholder table.

Table 10 : Proposed roles for each stakeholder

Country	Name of the organisation	Main activities in relation with the project	Role / involvement in project
SADC	SADC Water Division	Provision of framework for transboundary water management Coordination of transboundary initiatives	Benchmarking with other regional experiences and advice Benefits from operationalisation of SADC Protocol for Pungwe, Buzi, Save basins
Basins	Joint Water Commission	Bilateral dialog and advice to the respective governments on the conservation, development and utilisation of their shared water and watercourses	High-level orientation of the project Benefits from the operationalisation of JWC mandate at local level, with strengthening of bilateral rivers dialogue
State national and regional services			
Mozambique	National Water Council	Advice on cross-sectoral coordination	Support to JWC sessions preparation
	Ministry of Public Works, Housing and WR - DGNRH	National legal, policy and planning oversight of the water sector	Intervention in line with national policies and strategies for water resources management Implement and benefit from all project activities. Many activities aim at ARA-Centro capacities strengthening, that will host technical assistance
	ARA-Centro	Operational water management for Pungwe, Buzi and Save basins (planning, administration and control of public waters (including sanctions), licensing, approval and supervision of new hydraulic infrastructures, monitoring, water users dispute resolution, definition of protection areas)	
	National Institute of Disaster Management (INGC)	Natural Disasters (flood, drought, cyclone) prevention, coordination and day to day management	Implements and benefits from all project activities regarding flood management (Component 1)
	National Institute of Meteorology (INAM)	Climate monitoring and meteorological forecast	Implements and benefits from activities 1.1 (improvement of the Hydromet network) and activity 1.6 (information dissemination in early warning systems)

Country	Name of the organisation	Main activities in relation with the project	Role / involvement in project
	Ministry of Land, Environment and rural development (MITADER) - ND of Environment	National legal, policy and planning oversight of the environment sector	Involved in activities aiming at environmental protection (Component 2 and 3)
	Agência nacional de Controlo de Qualidade Ambiental	Water quality issues	Involved in activities regarding environmental enforcement strengthening (2.1)
	Instituto Nacional de Investigação Pesqueira	Knowledge management of marine, estruarine and riverine ecosystems, including mangroves and wetlands	Shall be involved and benefit from activities of characterisation of ecosystems (2.1) and consideration of their needs in terms of water regime (2.3: e-flows). Shall be involved in TDA/SAP process (3.1)
Zimbabwe	Ministry of Environment, Water and Climate (MEWC)	National legal, policy and planning oversight of the water sector National legal, policy and planning oversight of the environment sector (including water quality and wetlands) Climate monitoring and meteorological forecast Climate change adaptation and mitigation coordination	Intervention in line with national policies and strategies for water resources management Implement and benefit from all project activities.
	Ministry of Local Government, Public Works & National Housing - Department of Civil Protection	Natural Disasters prevention, coordination and management	Implements and benefits from Component 1
	ZINWA (Save /Runde)	Operational water management for Pungwe, Buzi and Save basins (planning, administration and control of public waters (including sanctions), licensing, approval and supervision of new hydraulic infrastructures, monitoring, water users dispute resolution, definition of protection areas)	Intervention in line with national policies and strategies for water resources management Implement and benefit from all project activities. Many activities aim at ZINWA capacities strengthening. Will host technical assistance
	Environment Management Agency (EMA)	Wetlands and water quality issues	Involved in activities aiming at environmental protection (Component 2 and 3).
	Nyanga National Park	Natural resources and wildlife protection and valorization	Involved into Activity 2.1 (identification of key ecosystems and assessment of their needs in terms of water regime)
	Gonarezhou National Park		
Moz	Gaza, Inhambane, Sofala and Manica Provincial offices	Cross-cutting coordination at provincial level Environmental officers in charge of pollution control	Involved in national meetings, information dissemination and community awareness on early warning systems (1.4, 3.3, 3.6)

Country	Name of the organisation	Main activities in relation with the project	Role / involvement in project
Zim	Masvingo, Manicaland, Mashonaland East, Matabeleland South and Midlands Provincial offices	Cross-cutting coordination at provincial level	
Moz	Massangena, Inhassoro, Govuro, Mabote, Machanga, Machaze District Councils	Cross-cutting coordination at district level	Involved in national meetings, information dissemination and community awareness on early warning systems (1.4, 3.3, 3.6)
Zim	Rural District Councils	Disaster risk management at district level	
Moz	Chimoio, Beira , Dongo Municipalities	Urban planning, climate change adaptation at city level, flood management & rescue	
Zim	Mutare, Gweru, Masvingo, Shurugwi, Zvishavane Municipalities	Urban planning	
Local decision and management bodies			
Moz	Basin Committees (Pungwe and Save)	Stakeholders participation	Involved in national meetings, and in particular for TDA/SAP Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3, 2.6)
Moz	Sub-basin Committees (Nhazonia, Gorongosa)	Stakeholders participation	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3)
Zim	Basin Committees (Save, Runde)	Coordination of sub-basin committees	Involved in national meetings, and in particular for TDA/SAP Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3)
Zim	12 sub-catchment councils	Stakeholders participation, water tariffs collection, legal control	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.3, 2.6)
Moz	Comites Locais de Gestao e Risco de Calamidades	Communities organisation for flood management	Involved in flood management plans elaboration (1.3) and water sharing procedures for e-flows/objective flows release (2.6)
Moz	Comites de gestão de Recursos naturais (CRN)	Natural resources management in Gorongosa area	Concerned CRN consulted for assessing key ecosystems status (2.1) and e-flows (2.3)
NGOs			
Moz	Global Water Partnership		Executing Agency. Implements all activities

Country	Name of the organisation	Main activities in relation with the project	Role / involvement in project
Moz	African Network of Basin Organisations / ANBO	Benchmarking, exchange of experience, support to IWRM implementation	Benchmarking and valorisation – involved in activity 3.6 and 3.7
Private sector			
Moz Zim	Farmers	Infrastructure construction. Water consumption and pollution as a result of agricultural activity	Involved in water uses assessment and water sharing procedures for e-flows/objective flows release (2.2, 2.6)
	Extractive mining companies	Water abstraction and pollution because of mining activities.	Interested in environmental enforcement strengthening (2.4)
	Gold panners	Fisheries (indigenous knowledge of fish ecology)	
	Fishermen	Operation of hydropower dams in Buzi basin	Consulted for assessing key ecosystems status (2.1) and e-flows (2.4)
Moz	Electricidade de Moçambique	Infrastructure construction. Water consumption and pollution as a result of agricultural activity	Involved in water uses assessment and water sharing procedures for e-flows/objective flows release (2.3)
Moz	Parque Nacional de Gorongosa (Carr Foundation)	Natural resources and wildlife protection and valorization	Involved into Activity 2.1 and 2.2
	Parque Nacional de Zinave		
Zim	Sustainable Agriculture Technology (Wildlife in Livelihood Development: WILD)		
	Save Valley Conservancy Trust (SVCT)		
Research			
Zam	University of Zambezi	Water quality analysis	Solicited in activity 2.4 (roadmap for environmental issues)
Moz	University of Maputo	Research on mangroves	Involved in ecosystems status and needs assessment (2.1)
regional	Waternet	Researchers mobilization for e-flows determination Researchers networking regarding water	Involved in e-flows assessment (BRIDGE operator)
Donors			
International	GRID-Arendal	Flood risk mapping; technical diagnostic analysis	Co-financing Involved in the establishment of a funds mobilization roadmap (3.7)
international	GIZ, DFID-CRIDF, GEF, …	Projects funding	

Zoom on NGO and community relays capacities

In Mozambique

Name of the organization	Focal area	Size *(number of employees)*	Capacity / Functionality (+ to +++)
Comites locais de gestao de riscos (CLGRC)	Communities: - 28 comites in the Buzi, basin including Rio Lucite/Dombe & Revue, - 6 in the Pungwe basin - 19 (Govuro & Machanga) in the Save basin	18 voluntary members	+++ (Buzi) + (Save & Pungwe)
Comites de gestão de Recursos naturais(CRN)	6 Gorongosa	18 voluntary members	+++

In Zimbabwe

Name of the organization	Focal area	Capacity / Functionality (+ to +++)
Southern Alliance for Indigenous Resources (SAFIRE)	Sustainable utilisation of resources by rural communities	++
Bio-Innovate Zimbabwe (BIZ)	The collection of natural products by poor communities for commercial use	+++
Save Valley Conservancy Trust (SVCT)	Wildlife conservation and management	+++
Sustainable Agriculture Technology (Wildlife in Livelihood Development: WILD)	EU-funded community based wildlife management in communal areas adjoining Gonarezhou National Park	+++
Frankfurt Zoological Society (FZS)	Joint managers of Gonarezhou National Park with strong links to community wildlife management projects	+++

7 Monitoring and Evaluation Plan

Monitoring and evaluation (M&E) of the proposed project will be conducted in accordance with established IUCN and GEF procedures/guidelines. The standard M&E reports and procedures required for all IUCN/GEF projects will apply to the M&E plan for the proposed project, including the following:

Inception Workshop and Report. The Inception Workshop gathering the stakeholders involved in the project, and resulting Inception Report are the venue and means to finalize preparations for the implementation of the proposed project, involving the formulation of the first annual work plan, detailing of stakeholder roles and responsibilities, and of reporting and monitoring requirements. As the Project Document was developed based on a consultative process that integrated both scoping and field missions as well as stakeholder workshops, it is anticipated that the inception workshop and the resulting report would result in only minor adjustments to the provisions in the original Project Document.

Strategic Result Framework. Monitoring and evaluation begins with preparation of the Project Document, including a logical framework matrix based on indicators of implementation progress and means of verification. This Log Frame will underpin a results-based M&E system for the proposed project.

Quarterly Progress Report. Each quarter, the PMU will prepare a summary of the project's substantive and technical progress towards achieving its objectives. The summaries will be submitted to GWP, and will reviewed and cleared by IUCN before being sent to the IUCN/GEF Coordinator.

The Annual Project Report (APR) / project implementation review is designed to integrate the independent views of the main stakeholders of a project on its relevance, performance and the likelihood of its success. The APR covers performance assessments on project outputs and outcomes, major achievements, evidence of success, constraints, lessons learned and recommendations as well as an overall rating of the project. The APR will be prepared by the Project Coordinator after consultation with the relevant stakeholders, and will be submitted to the GWP. The stakeholder review will be framed by the logical framework matrix and the performance indicators. A Terminal Project Report will be prepared for the terminal meeting.

Tripartite Review (TPR) (Steering committee). The Tri-Partite Review (TPR) is a policy-level meeting of the parties directly involved in the implementation of a project. The same parties involved in the prior Inception Workshop will participate in the TPR (i.e., the members of the Steering Committee, including the regional and national executing agencies, IUCN, local partners, direct beneficiaries and other stakeholders). It will assess the progress of the project and make decisions on recommendations to improve the design and implementation of the project in order to achieve the expected results. On these occasions, the Project Coordinator will submit an updated work plan (if required) and the latest Annual Project Report (APR), and formulate recommendations for eventual adjustments of strategies and activities. A draft APR shall be prepared at least two months in advance of the TPR to allow for review by IUCN prior to the meeting. The Executing Agency will make sure that the recommendations of the TPR are carried out. Annual TPRs are not required as the Steering Committee meetings are expected to address many of the issues that would normally be addressed in a TPR.

Independent External Evaluation at mid-term and termination of the project. A mid-term project evaluation will be conducted during the third implementation year, focusing on relevance; performance (effectiveness, efficiency and timeliness); issues requiring decisions and actions; and initial lessons learned about project design, implementation and management. A final evaluation, which occurs three months prior to the final TPR meeting, focuses on the same issues as the mid-term evaluation but also covers impact, sustainability, and follow-through recommendations, including the contribution to capacity development and the achievement of global environmental goals.

Budget Revisions. Project budget revisions will reflect the final expenditures for the preceding year, to enable the preparation of a realistic plan for the provision of inputs for the current year. Other budget revisions may be undertaken as necessary during the course of the project. It is expected that significant revisions will be cleared with the IUCN/GEF Coordinator for consistency with the GEF principle of incrementality and GEF eligibility criteria before being approved;

Corresponding budget. The corresponding budget for the M&E plan is USD 173,550. The detailed budget of the M&E plan is provided within the detailed budget of the overall GEF project (Appendix 7).

The overall monitoring and evaluation plan is summarized in Table 11 below.

Table 11: M&E activities, timeframe and responsibilities

M&E activity	Frequency	Responsible	Budget (GEF funded)	Amount
Project Planning Documents: PRODOC, Logframe (including indicators), M&E Plan	During project design stage	Project proponent together with RPMU Staff and consultants and other stakeholders	PPG grant	150, 000
Quarterly Progress Report	Quarterly	Project coordinator and project team	Activities 1.7, 2.8 & 3.8	62,700
Annual Project Progress Report	Annually	Project coordinator and project team in consultation with project stakeholders		
Tripartite Review / Project Implementation Review (PIR)	At 18 months	Regional Executing Agency, The Governments (National Executing Agencies), Regional Project Coordinator, project team,	PMC	45, 000
Independent External Evaluation	At the mid-point and end of project implementation	Executing Agency (GWP)	Activity 4.3	27, 550

Budget revisions	When necessary	Project team, IUCN headquarters	PMC	38, 300

In addition to the standard IUCN and GEF procedures outlined above, the project will benefit from annual Steering Committee Meetings. The Steering Committee is the primary policy-making body for the present Mano River project. The Regional Project Coordinator will schedule and report on Steering Committee Meetings.

8 Project Financing and Budget

The overall project budget is 6,540,000 USD, excluding the PPG mission costs. It comprises the following items:

- Implementing Agency Fee: 540,000 USD;
- Activities Budget: 6,000,000 USD.

Component 1	2,842,950USD
Component 2	1,509,700USD
Component 3	1,313,475USD
Project management cost	333,875 USD

The activity summary budget and schedule are presented in the following tables. The detailed budget is provided in Appendix 6.

9 Appendices

Appendix 1: Site selection process - Detailed maps of intervention sites.

Appendix 2: Project Organisational flow.

Appendix 3: GEF IW tracking tools – *See Excel files.*

Appendix 4: ESMS clearance sheet and ESMF – *See questionnaire and document attached in a Word format.*

Appendix 5: Activities schedule / project work plan - *See Excel file attached.*

Appendix 6: Detailed project budget - *See Excel file attached.*

Appendix 7: Procurement plan - *See Excel file attached*

Appendix 8: Signed co-financing letters

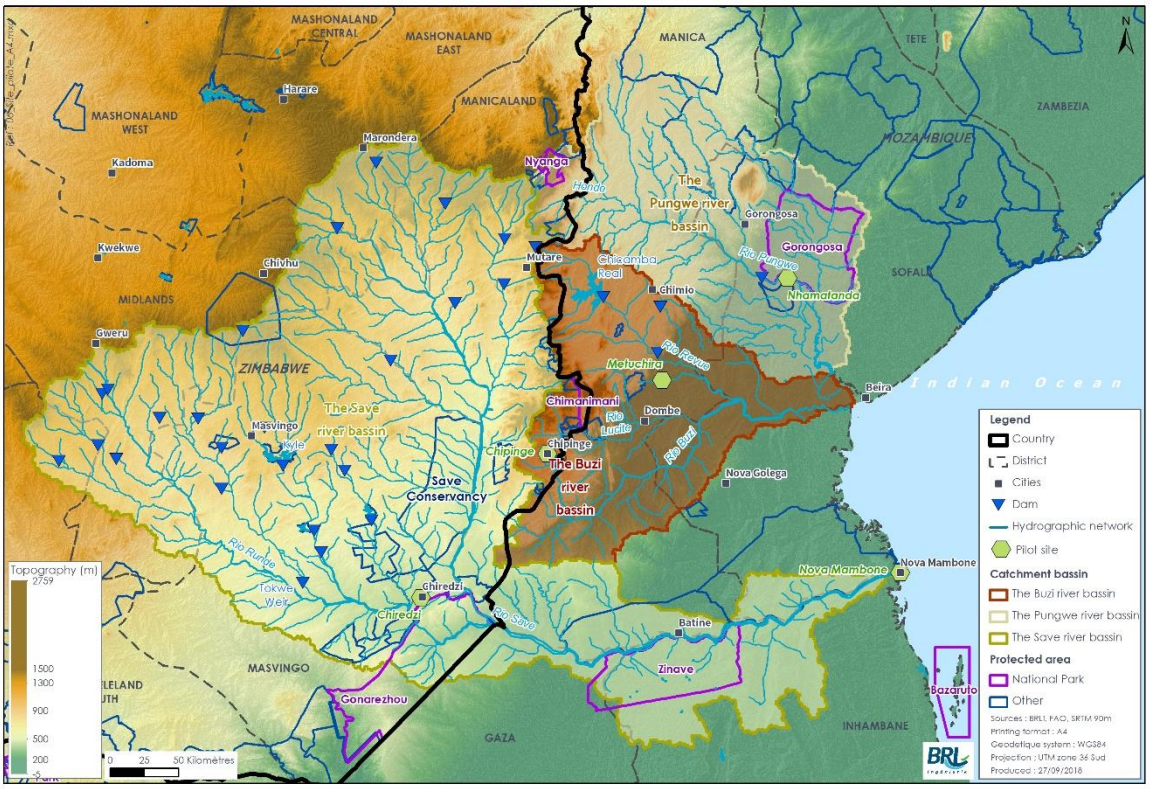
Appendix 9: GEF Operational Focal Point Endorsement Letters

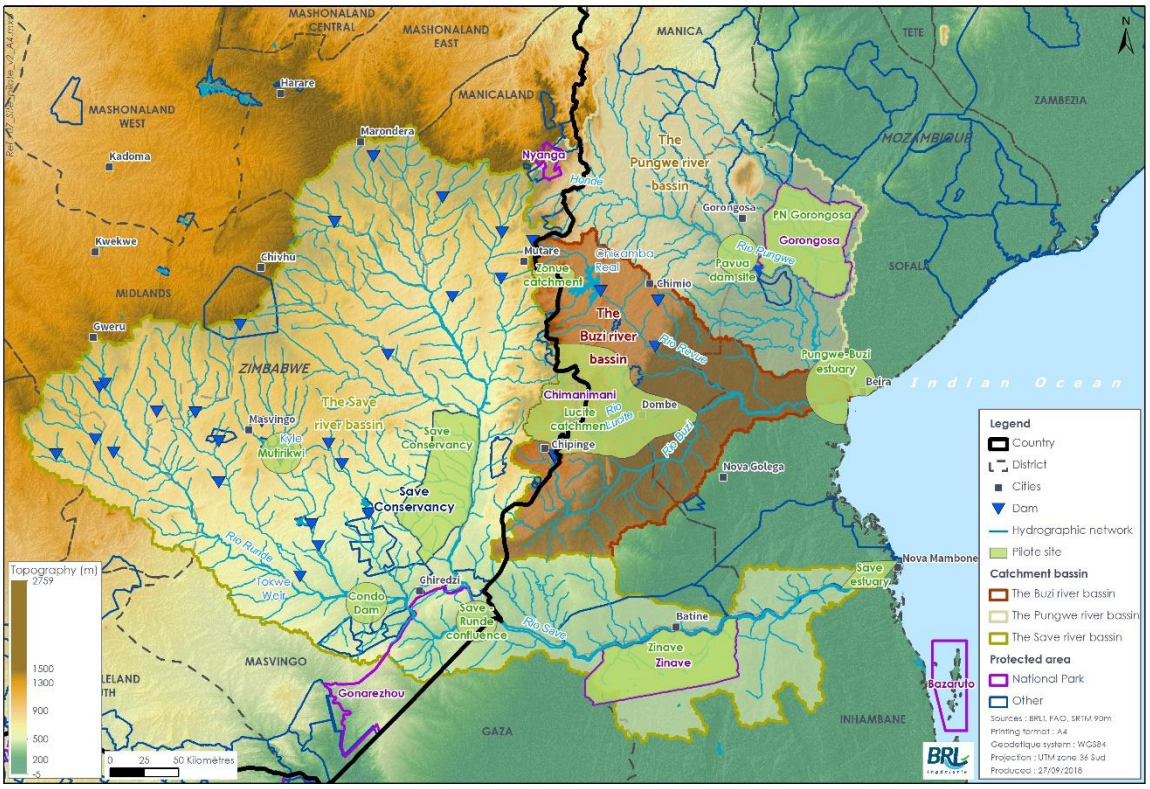
Appendix 10: Methodological note for pilot sites determination

Appendix 11: List of stakeholders met

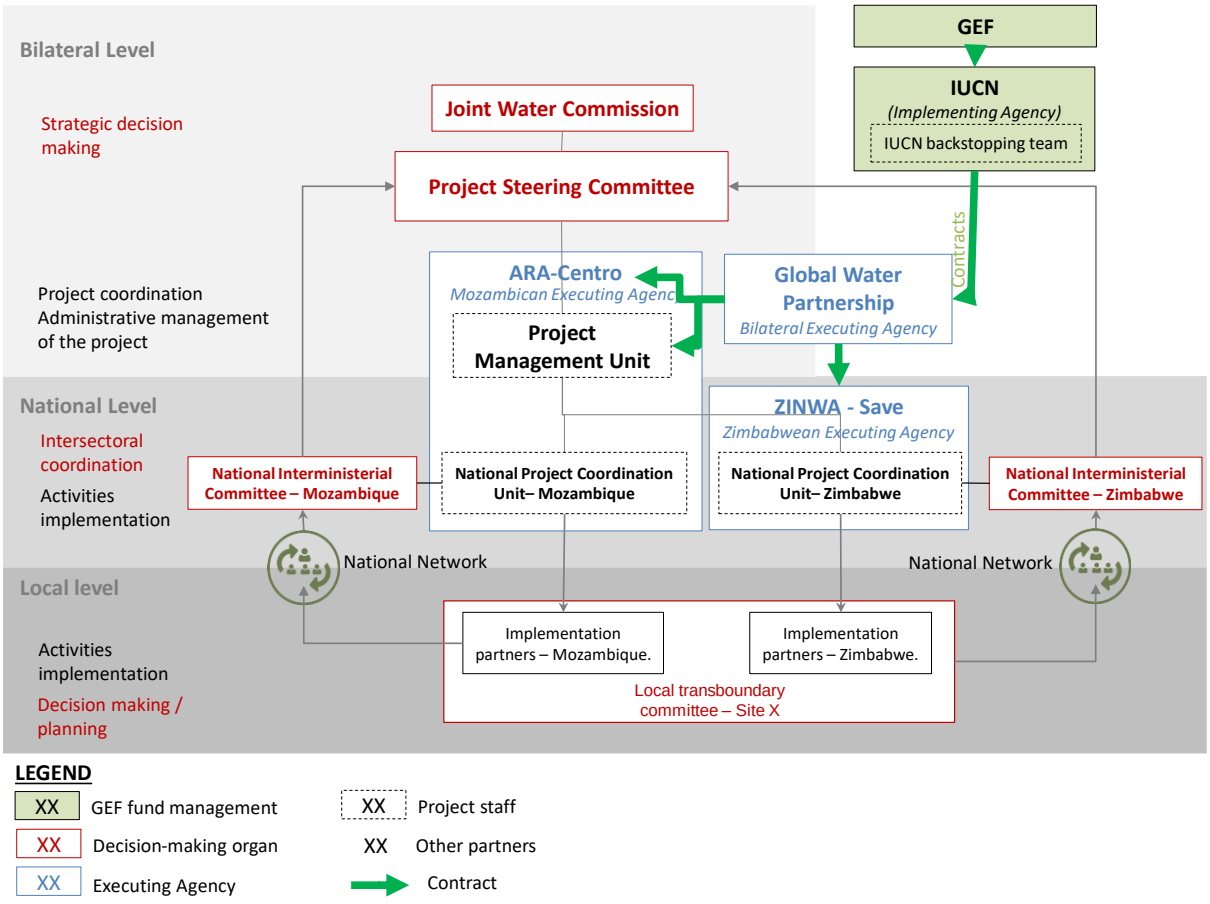
Appendix 12: Final workshop Minutes

Appendix 1: Site selection process - Detailed maps of intervention sites.





Appendix 2: Project Organisational flow.



LEGEND

XX GEF fund management	XX Project staff
XX Decision-making organ	XX Other partners
XX Executing Agency	Contract

Appendix 3: GEF IW tracking tools – *See Excel files.*

Appendix 4: ESMS clearance sheet

See separate questionnaire in Word format.

Appendix 5: Activities schedule / project work plan - *See Excel file.*

Appendix 6: Detailed project budget - *See Excel file.*

Appendix 7: Procurement plan - *See Excel file.*

Appendix 8: Signed co-financing letters

Documents attached to the submission

Appendix 9: GEF Operational Focal Point Endorsement Letters

"All communications should be addressed, "The Secretary for Environment, Water and Climate"

P. Bag 7753 Causeway,
Harare, Zimbabwe

Telephone: 701681/3
Fax: 252673

Our Ref:

ZIMBABWE

MINISTRY OF ENVIRONMENT, WATER & CLIMATE

11th Floor,
Kaguvi Building
Cnr 4th Street/Central Avenue
Harare

06 April 2017

To: Jean-Yves Pirot
IUCN
Rue Mauverney 28, 1196, Gland, Switzerland]

Subject: Endorsement for Pungwe Integrated Water Resources Management Project

In my capacity as GEF Operational Focal Point for Zimbabwe, I confirm that the above project proposal (a) is in accordance with my government's national priorities ,and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency(ies) listed below. If approved, the proposal will be prepared and implemented by by Ministry of Public Work, Housing and Water Resources of Mozambique and the Ministry of Environment, Water and Climate Change of Zimbabwe. I request the GEF Agency(ies) to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

The total financing (from GEFTF, LDCF, or SCCF) being requested for this project is US$6,703,500, inclusive of project preparation grant (PPG), if any, and Agency fees for project cycle management services associated with the total GEF grant. The financing requested for Mozambique and Zimbabwe in the context of this project is detailed in the table below.

Source of Funds	GEF Agency	Focal Area	Amount (in US$)			
			Project Preparation	Project	Fee	Total
GEFTF	IUCN	Internation	150,000	6,000,000	553,500	6,703,500
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total GEF Resources			150,000	6,000,000	553,500	6,703,500

Sincerely,

Mr. Tanyaradzwa MUNDOGA
Ministry of Environment,Water and Climate
GEF Operationnal Focal Point Zimbabwe

GEF Operational Focal Point Endorsement Template. April 2015

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL

DIRECÇÃO NACIONAL DO AMBIENTE

Departamento de Adaptação e Mitigação as Mudanças Climáticas

July, 22nd 2016

To: Jean-Yves Pirot
IUCN
Rue Mauverney 28, 1196, Gland, Switzerland]

Subject: Endorsement for Pungwe Integrated Water Resources Management Project

In my capacity as GEF Operational Focal Point for Mozambique, I confirm that the above project proposal (a) is in accordance with my government's national priorities ,and our commitment to the relevant global environmental conventions; and (b) was discussed with relevant stakeholders, including the global environmental convention focal points.

I am pleased to endorse the preparation of the above project proposal with the support of the GEF Agency(ies) listed below. If approved, the proposal will be prepared and implemented by Ministry of Public Work, Housing and Water Resources of Mozambique and the Ministry of Environment, Water and Climate Change of Zimbabwe. I request the GEF Agency(ies) to provide a copy of the project document before it is submitted to the GEF Secretariat for CEO endorsement.

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(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
Total GEF Resources			150,000	6,000,000	553,500	6,703,500

Sincerely,

Marília Telma António Manjate

GEF Operationnal Focal Point Mozmabique

Appendix 10: Methodological note for pilot sites determination

PREPARATION OF THE GEF-FUNDED PROJECT: "MANAGEMENT OF COMPETING WATER USES AND ASSOCIATED ECOSYSTEMS IN PUNGWE, BUZI AND SAVE BASINS"

Identification of pilot sites

Note proposing methodological approach

Version 1

March 2018

PREPARATION OF THE GEF-FUNDED PROJECT "MANAGEMENT OF COMPETING WATER USES AND ASSOCIATED ECOSYSTEMS IN PUNGWE, BUSI AND SAVE BASINS"

Identification of pilot sites

Note proposing methodological approach

The project "management of competing water uses and associated ecosystems in Pungwe, Buzi and Save Basins" (in short : PuBuSa) aims to support the conservation and sustainable use of these 3 transboundary water basins, that are the only ones shared bilaterally by Mozambique and Zimbabwe. It is funded by the Global Environmental Fund (GEF), and currently carried by the International Union for the Conservation of Nature (IUCN). The present assignment aims at supporting IUCN and its Mozambican and Zimbabwean partners in the preparation of the project.

Based on the results of the February 13th inception workshop in Pretoria, and further discussions with IUCN, the inception report (released on March 19th, 2018) concludes that a list of potential pilot sites shall be identified prior to the Consultant's field mission in April.

Indeed, the objective of the field mission is to fine-tune project activities required to answer both national priorities/local expectations and IUCN/GEF environmental and social policies. The mission will include (extract of the technical proposal):

- *Identification of the project enabling conditions to ensure that implementation arrangements, partnership strategies and capacities are in place and adequate for the successful project implementation and its sustainability;*
- ***Site-scale situational analysis through field work*** *(socio-economic conditions, stakeholder identification and consultation, land ownership/tenure/rights, status of ecosystems, main threats, gender issues, indigenous knowledge, existing ecosystem conservation tools and practices in place, identification of measures required to alleviate the threats and estimation of their expected social and environmental benefits).*
- *Project institutional set-up and partnerships. The diagnosis of the capacity of the executing agencies and the local partners will be deepened to feed the stakeholder engagement plan.*

The objective of the present note is to propose methodological guidance to IUCN and its partners in the identification of pilot sites for the PuBuSa project.

1. Project rationale

The project rationale described in the PIF is summarized in the following table. The elements in blue underline the projects outputs for which pilot sites identification is expected.

Table 12 : indicative project description summary

Project Components	Project Outcomes	Project Outputs
Component 1		
Integrated basin planning for the Pungwe - Buzi – Save River Basins	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.
		Pungwe-Save-Buzi Strategic Action 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
		Partnership development and donor partners Conference held to raise funds for SAP implementation
		Active platform for learning and experience sharing across GEF-IW portfolio and with other GEF-6 relevant transboundary initiatives
Component 2		
Flood and Drought Warning and Mitigation	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
		Flood Forecasting and Early Warning Systems improved , including hosting, improving and utilizing hydrological and hydraulic flood zone modelling (flood risk mapping) as well as **community level early warning systems. Includes implementation of flood mitigation and adaptation interventions in high risk communities**
		Ground Water and drought management mainstreamed into Basin Planning
		Operationalization of data and information sharing and exchange procedures
Component 3		
Transboundary environmental flow policy and regulatory framework	Policy and regulatory frameworks5 for e-flow regulation management adopted in the Pungwe-	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).

for the Pungwe-Buzi and Save basins strengthened	Buzi-Save basins. Building on the Pungwe agreement	
	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**.
		E-flow operational policies of **proposed new/ existing storage infrastructure in the Pungwe – Buzi basins** agreed etc.
		E-flow operational **policies for the mangrove areas in the estuary of the Pungwe –Buzi basins** formulated

Source: PIF

2. Pilot sites for Component 2: flood and drought warning and mitigation

For Component 2 (flood and drought warning and mitigation), the PIF identified the implementation of **pilot flood mitigation interventions in high risk communities** (construction of small scale flood protection infrastructure, disaster risk awareness raising and community-based adaptation measures).

The inception workshop considered the e-flows component as a priority and the pilot site for component 2 was not much discussed. It may be proposed that the Buzi experience of community early warning could be upscaled to the Pungwe and Save.

2.1 PIF's framework

The following PIF paragraphs give the following information for output 2-1-1's pilot site selection:

*« 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. »*

2.2 Context discussed in the inception mission

Flooding is a very important issue both in Mozambique and Zimbabwe. Flash floods occur in mountainous areas, and major floods with slower dynamics in low-lying areas (such as the Save floodplain).

- According to the stakeholders met, much has already been done regarding flood forecasting and modelling. Multiplying the models may lead to inefficiencies. This issue needs to be further discussed during the field mission, to have a clear picture of the baseline and of the chain of models used :
  - vulnerability assessment (flooded areas),

- weather forecast (short term/localized for flash floods, use of the South African Flash Flood Guidance System (SAFFG), and of SADC/USGS products, …)
- real time information system
- real time flood modelling (including tidal influence, as proposed in the PIF)

- Regarding early warning, interesting experience have been experimented in Mozambique (SMS warning, Buzi model of community early warning, …) and may be upscaled. Some actions initially planned by the PP2 (multiple use platforms) but not implemented may also be reactivated.

2.3 Proposal

During the scoping mission, it was reported that the Buzi model for flood community early warning and management (Sistema Inter-distrital de Aviso Prévio da Bacia do Búzi (SIDPABB)) has been a success. It has been replicated in the Mozambican part of the Save river (Sistema de Aviso Prévio para Rio Save). It is thus proposed to upscale the activities held in this project to other high-risk communities in the Pungwe and upstream Save basins.

The pilot sites to be identified shall meet the following criteria:

- Highly vulnerable communities,
- Isolation (limited access to real time information …).

3. Pilot sites for component 3: transboundary e-flow policy and regulatory framework for the PuBuSa basins

For Component 3, the PIF identified **3 types of pilot sites to experiment environmental flows management,** in the Buzi and Pungwe basins (given the complexity and level of development of the Save basin, the lessons from Pungwe and Buzi would be applied in the future in the Save):

- Selected transboundary catchments, which management will enhance the delivery of environmental services,
- Existing/new storage infrastructure in the Pungwe or Buzi basins (such as Muda Dam and Nhacangare Damon Pungwe river in Mozambique, or Pungwe Falls Dam in Zimbabwe). An allocation policy for active or restrictive flow management will enable to avoid altering downstream ecosystems.
- Pilot site in the estuarine (mangrove) area in the Pungwe-Buzi basins, for which an e-flow operational policy shall be formulated.

However, the inception workshop brought several objections:

- it was underlined that several pilot sites had already been experienced, and that the new pilot sites should be part of a method aiming at developing an overall e-flows operational policy.
- The choice of Pungwe and Buzi basins was questioned as it does not enable to balance the pilot sites between Mozambique and Zimbabwe.

This paragraph aims at proposing a method for pilot sites selection.

3.1 Pif's framework

The following PIF paragraphs give the following information for outputs 3-2's pilot site selection:

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 estruarine 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.

3.2 Context discussed within the inception mission

Environmental flows are almost unanimously the issue considered as a priority in the short term.

- The **Pungwe** basin has the most pristine watercourses (out of the Penhalonga area). 5% of the basin is in Zimbabwe, but generates ~ 25% of flows.

  It has important environmental issues downstream: **the estuary region and the mangroves** area is ecologically connected to the Banco de Sofala, which fish and prawns resources are the most important fishing resource in Mozambique. The mangrove area close to Beira seems quite degraded due to the commercial and industrial activities. Seasonally during low flows, marine salinity flows back in the estuary and the downstream part of the Pungwe. These last years, this phenomenon affected Beira drinking water supply (slightly saline water supplied seasonally) which had to move its intake upstream, and sugar estates abstractions close to Beira. A study of possible solutions to limit salinity intrusion has been conducted [to be identified and collected][16]. Documents about the mangroves and the estuary ecosystems (status, functioning, management, economic value, hydrological/salinity needs), and the feasibility of measures to control salinity also need to be collected.

[16] **The 2008 model (S. Graas et H. H. G. Savenije 2008) indicated that a 12 m3/s flow is needed to maintain salinity to acceptable levels**

The city of Mutare, located in the upstream Save basin, is supplied by Pungwe upstream waters[17], and some environmental flows issues are met locally. The Pungwe-B dam project is to be constructed in this area.

The management of the Gorongosa national park is considered as a success story with international reputation (Carr foundation). Interesting initiatives of community management of natural resources have been put in place.

Dams construction is also planned upstream.

This is the only basin that has a signed agreement, with provisions for e-flows implementation.

- The **Buzi** has a few dams, and environmental flows are under determination upstream and downstream the Chicamba dam[18] on the Revue river (in Zimbabwe and Mozambique respectively – BRIDGE project). The Buzi estuary joins the Pungwe's in the Beira area. The mangrove on the Buzi side is better preserved than the Pungwe's (with initiatives for community management of the mangrove);
- The **Save** is heavily dammed upstream (47 dams) with complex hydro-works (basin transfers), intensive irrigation use and hydropower production. The Save Veld in Zimbabwe is the driest part of the country. It counts several important downstream wetlands such as the Gonarezhou[19] and Zinave[20] national parks and some conservancy areas (Malilangwe, Save) most of which are connex to the Gonarezhou NP (Batani, Twananai, Chibwedziva, Dzidzela, Chitsa, Mahenye, Mutandahwe) or the Zinave NP (Coutada official N°4 & 5).

  Due to the high number of dams, this is the basin that offers most possibilities for flows regulation. However, due to the already existing uses, this possibility of operationalizing e-flows may be hard to implement and negotiate. The Buzi Agreement under negotiations may open the possibility of a water transfer of Buzi waters to the downstream Save (the feasibility study of the transfer needs to be collected).

3.3 Definition of the concepts

If the notion of environmental flows is conceptually clear (leaving enough water for maintaining healthy ecosystems connected to rivers and corresponding services), its operational implementation refer to quite complex theoretical background and tools (hydrological, statistical and ecological) for determining the value of these e-flows. Thus we would like to agree on prior definitions

[17] In 1999 a pipeline that transfers water from the Pungwe River to the Odzani catchment (a part of the Save River basin) to augment supplies to the City of Mutare was constructed. The quantities involved are 0.7m3/s (22million m3 per year) which corresponds to 16% of the mean annual runoff, but 50% of low flows. The water permit is 0.75 m3/s in Zimbabwe. The agreement with Mozambique is that Mutare can abstract 0.7m3 provided there is always 0.5m3 /s in the river. However, this minimum flow is not maintained every year.(Black Crystal Consulting Private Ltd 2013)

[18] Chicamba Dam, 2020 Mm3, hydropower production at this dam and at the Mavuzi dam downstream, supply of Chimoio, Manica, and Gondola cities (15 Mm3),

Mavuzi dam, 1.8 Mm3, run-of-the-river hydropower scheme.

[19] The Gonarezhou NP in Zimbabwe is the only national park with permanent waterpoints (permanent flows in the rivers)

[20] The Zinave NP seems to comprise hydrosystems/wetlands (a system of pools) connected to the Save, and filled by Save floods

The IUCN gives the following definition[21]: "*An environmental flow is the **water regime** provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are **competing water uses and where flows are regulated**."* In other words:

- Environmental flows concern only quantitative flow regimes. Water quality is out of the scope of environmental flows (except for the limited issue of pollutants dilution).
- Environmental flows may concern seasonal variation of flow patterns (generally for the inundation of wetlands/spawning areas during floods and maintenance of characteristics of low flows periods).
- The ways to modulate river flows for maintaining environmental flows are:
  - Mobilization of upstream dams regulatory capacity,
  - Water transfers,
  - Restriction of upstream abstractions.

  These modulations generally affect formal water uses, but *"the price of not providing environmental flows should not be underestimated[21]"* due to economic value of the bioresources and traditional water uses that will benefit from these e-flows, and that are generally in areas where alternative livelihoods may be hard to develop.

In the following paragraph, we will differentiate :

- **Environmental needs :** the quantitative flow regime enabling to maintain vital functions of the ecosystems. This only focusses on the ecosystems health, without considering human use or regulations possibilities. Only water levels and water flows are to be considered: other parameters such as temperature, quality or turbidity are only indirectly and partially included through their links to flow regime through dilution. It means answering the following questions:

  Which minimum/maximum water flows and levels, at which period, and during which duration enable to maintain vital ecosystem functions?

  There is no single best method, approach or framework to determine the environmental flow. The existing methods for determining an environmental flow range from desk-top analysis (like hydrological statistics) to functional analysis and habitat modelling[21].
- **Objective flows:** flows that shall be maintained in the river for ensuring downstream environmental needs and priority water uses. The objective flows determination relies on water balance scenarios and water allocation decision. Implementing the objective flows requires controlling water flows, at least partially, which appeals to active dams management, and/or restrictive flow management. This generally needs respectively adapting and coordinating dams operation rules, and elaborating drought management plans indicating water uses constraints (such as abstractions reduction) for different levels of water stress. It means answering the following questions:

  Which water conditions (flows, levels) in which key locations shall be maintained to ensure environmental needs, priority water uses, and chosen allocation scenario? Which evolutions of dams management and water uses restrictions shall be made as a consequence?

3.4 Criteria for determining pilot sites

We propose 2 types of criteria to determine pilot sites:

- Technical,
- Politico-institutional.

We suggest to have a 2-stages approach for determining the pilot sites:

- A screening of potential pilot sites based on technical criteria,

[21] IUCN, 2003. The essentials of environmental flows.

- A selection of the pilot sites among this list based on political criteria.

Beyond the criteria to determine pilot sites individually, we wish to underline the importance of having a choice of pilot sites made in accordance with an **overall strategy** giving coherence to the sites in the perspective of a broader objective: “strengthening environmental flow management framework for improved decision-making” (as formulated in the PIF).

The overall strategy has been discussed during the scoping mission in February. Schematically, 3 possible strategies emerged and are summarized hereunder:

- Focus on the Pungwe (or Pungwe-Buzi basins as proposed the PIF);
- Focus on the Save basin;
- Distributed over the 3 basins.

The following paragraphs also discuss these 3 strategies.

3.4.1 Stage 1: Screening

Technical criteria

There are 2 possible ways to screen potential pilot sites to experiment environmental flows, either focusing on environmental needs, or focusing on possible management. They imply to ask successively the following questions:

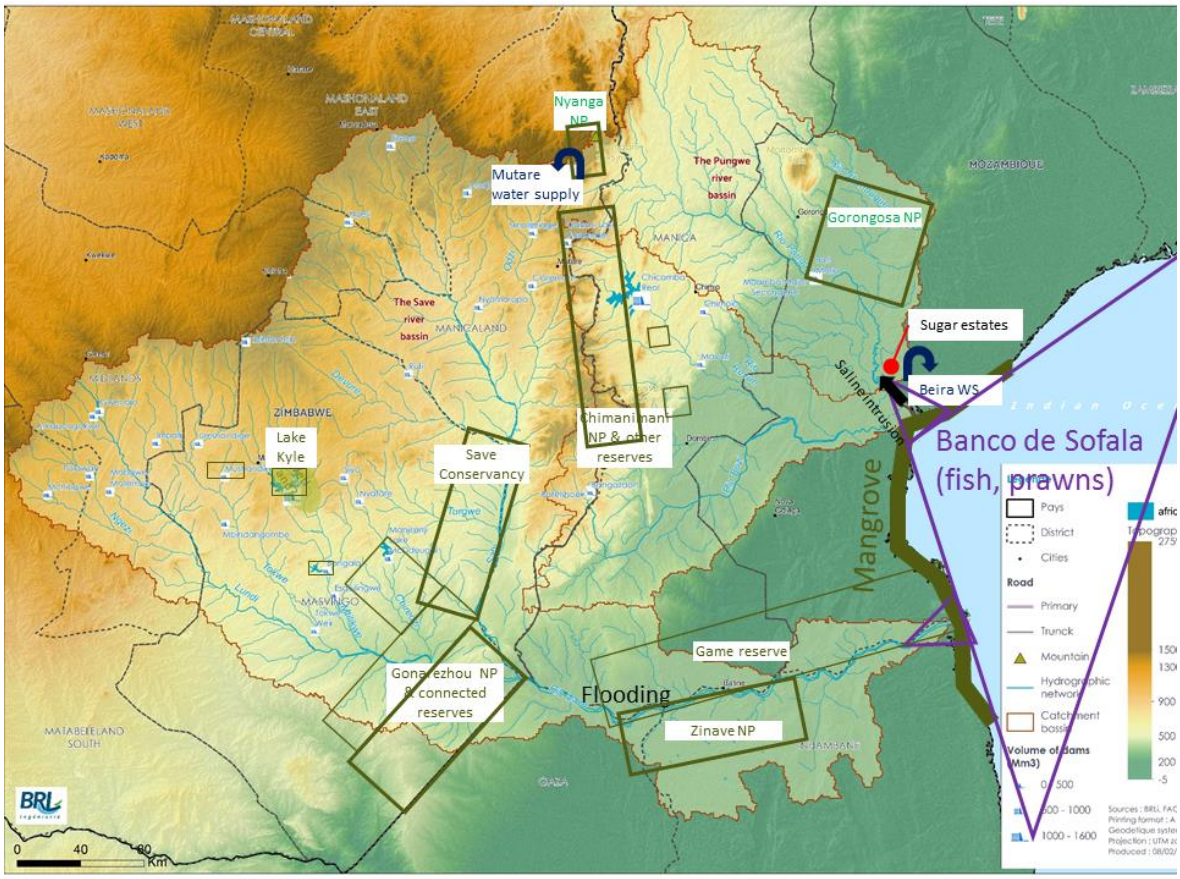
Environmental needs focus	Flow management focus
1. What are the *key** ecosystems connected to rivers (aquatic ecosystems, wetlands)? 2. Are there quantitative modifications of flow regime (dams regulation, water uses, transfers) that may affect their functionality?	1. What are the main current/future water infrastructure (dams, uses, transfers)? What are the current water uses conflicts? 2. Which key* downstream ecosystems are they likely to affect?

** Key in terms of conservancy importance or in terms of ecosystems services (bio-resources production (fish spawning area, …), flood control, …).*

These questions enable to identify a pool of potential pilot sites.

The following map points at water uses conflicts evocated during the scoping mission and conservancy areas.

Figure 12: conservancy areas and water conflicts evocated during the scoping mission



In the PIF the following potential sites had been listed:

- Future Muda Dam on Pugwe river in Mozambique;
- Future Nhacangare Dam on Pungwe River in Mozambique
- Future Pungwe Falls Dam in Zimbabwe
- Pungwe/Buzi estuary.

We wish to add the following potential sites :

- Gonarezhou national park in Save Basin in Zimbabwe;
- Save Conservancy area in Save Basin in Zimbabwe;
- Zinave National park in Save Basin in Mozambique;
- Gorongosa national park in Pungwe basin in Mozambique;
- Mutare water supply intake in Pungwe basin in Zimbabwe.

Analysis of the 3 strategies in light of technical criteria

Table 13 : Analysis of the 3 strategies in light of technical criteria

Pilot sites to be chosen…	Justification	Weaknesses
In the Pungwe basin	- Mangrove/estuary=important area in Mozambique for fishing resource - Salinity issues in the estuary - Dams planned upstream that will develop flow regulation potential	- Current situation: very limited possibilities to regulate the flows

	- The most pristine upstream - Several - Important water quality challenges (NB: that cannot be solved with e-flows)	
In the Save basin	- Many dams: potential impacts on downstream ecosystems and uses - Many dams: possibilities of flow regulation (optimization of dams rules) - Two national parks sites in the downstream area connected with the river (Zinave, Gonarezhou)	- Due to the high rate of damming, the complexity of hydraulic system and associated uses, evolution of dams regulation to implement e-flows may be difficult to implement
Distributed over the 3 basins	- Sites can be chosen to be a representative sample of key ecosystems and situations.	- Risk of sprinkling without being able develop an overall strategy afterwards.

3.4.2 Stage 2: Selection

Politico-institutional criteria

The reflection site by site on the geopolitical, political, social, economic opportunity of selecting this site (family of criteria earlier called "politico-institutional" criteria), such as:

- transboundary dimension,
- governance criteria (existence of a transboundary signed agreement, dynamism of management instances),
- socio-economic importance,
- coherence with national priorities, …

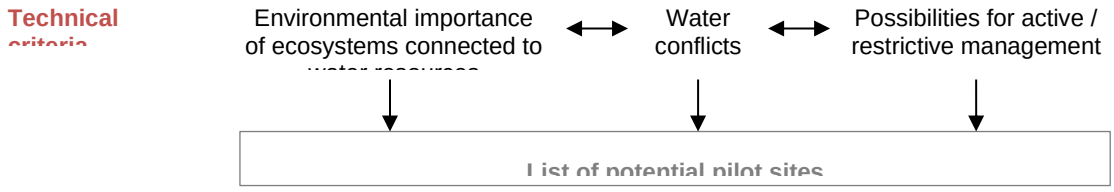
Analysis of the 3 strategies in light of politico-institutional criteria

Table 14 : Analysis of the 3 strategies in light of politico-institutional criteria

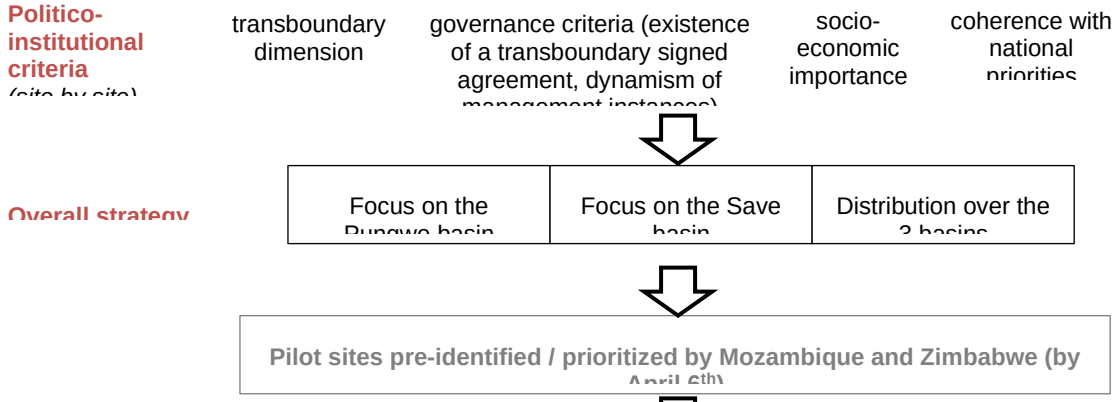
Pilot sites to be chosen…	Justification	Weaknesses
In the Pungwe basin	- The only basin with a signed agreement - Operationalize e-flows in a comprehensive manner in 1 basin quite simple to elaborate and test, that will then be upscaled to others	- Mostly concentrated in Mozambique - Representative enough to be upscaled in an e-flow management policy?
In the Save basin	Operationalize e-flows in a comprehensive manner in 1 basin to elaborate and test that will then be upscaled to others	- No signed agreement - Representative enough to be upscaled in an e-flow management policy?
Distributed over the 3 basins	- Sites scattered over Mozambique and Zimbabwe	- Risk of sprinkling without being able develop an overall strategy afterwards.

Summary of the identification stages

1 - Screening



2 – Pre-selection



Validation

Pilot sites identification workshop (April 13th - IUCN, partners, BRLi)

Pilot sites visit (April 14th to 27th - BRLi, IUCN, stakeholders)

3.5 Proposed strategy and possible selection of pilot sites

Based on the proposed identification methodology and criteria, the **Consultant's recommendation** is as follows.

List of proposed project intervention sites:

- Site 1: Beira estuary/mangrove ecosystem (Pungwe-Buzi Basins);
- Site 2: Bue Maria Dam (Pungwe-Buzi Basins);
- Site 3: Chicamba Dam (Pungwe-Buzi Basins);
- Site 4: Gonarezhou National Park (Save Basin);
- Site 5: Zinave National Park (Save Basin).

The location of the proposed intervention sites is shown on the map next page (Figure 2).

Proposed strategy and preliminary list of key activities

The proposed selection of sites is underpinned by the following strategy and preliminary key activities:

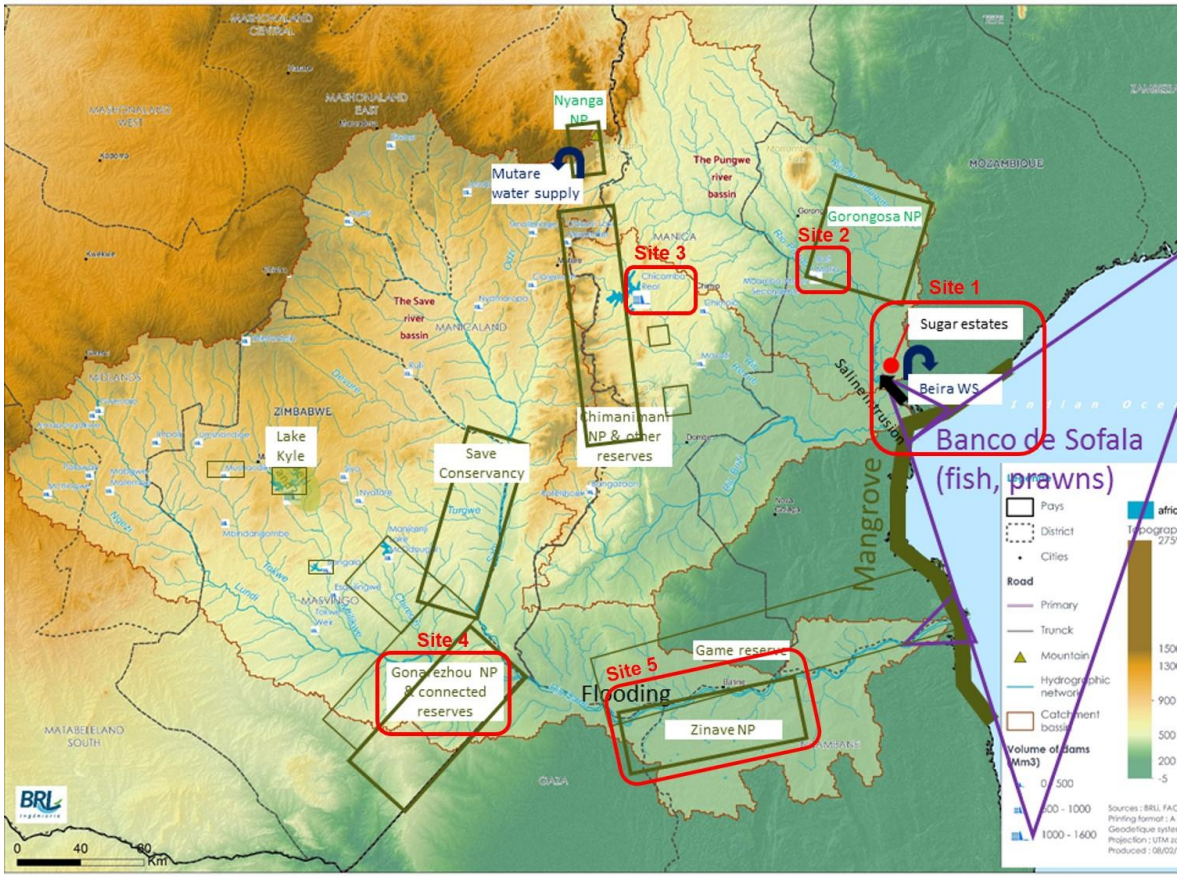
- **Pungwe-Buzi basins: Full methodology of determination of objective flows**:
  - Determination of environmental needs in the estuary/mangrove area (ecosystem functionality, salinity) – **Site 1**;
  - Determination of objective flows through basin allocation;
  - Determination of dams release and revision of regulation rules in the Pungwe / Buzi basins (Bue Maria Dam – **Site 2** and Chicamba dam – **Site 3**).

    This activity will build on the outputs of BRIDGE project (e-flows determination around Chicamba dam) and on studies mentioned in the inception mission that have analysed salinity control possibilities in downstream Save (but that BRLi hasn't collected yet).
- **Save Basin: Determination of environmental needs of Gonarezhou** (**Site 4**) **and Zinave** (**Site 5**) **national parks**. Due to the complexity of the Save upstream basin, it is currently proposed to concentrate on the environmental needs determination, leaving the stage of objective flows / dams regulation rules elaboration to a next phase.

  A study of dams operation rules in the Save Basin is currently ongoing (CRDIF funding). Further information on this study will be needed to fine-tune the contours of the activity.

This recommendation is a proposition to be further discussed and possibly amended during the pre-identification workshop.

Figure 13: proposed pilot sites in red



4. Validation and way forward

- Once pilot sites discussion in each country has progressed (with possibly a list of pre-identified pilot sent to IUCN), all the partners (Mozambican and Zimbabwean governments, IUCN, BRLi) meet in an **identification workshop to validate the selection of sites** that the consultant is going to visit in the field mission. The workshop is planned on April 13th, to be confirmed by the IUCN.
- The consultant holds the **field mission (April 14th - April 27th)** and **develops the project documents on this base (May)**.
- All the partners (Mozambican and Zimbabwean governments, IUCN, BRLi) meet again in a **validation workshop in June**, aiming at discussing and fine-tuning the project preparation documents.

Appendix 11: List of stakeholders met

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Carmo Jemuce	Comite GRC/Metuchira/ Nhamatanda	Responsavel de Kit	
Abrão Maússe	Comite GRC/Metuchira/ Nhamatanda	Busca e resgate	
Regulo Pavua e comunidade	Localidade de Pavua/Gorongosa/Pungue	Lider local/Comunitario Mpfumo	
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Appendix 12: Final workshop Minutes

Document attached to submission

Appendix 13: Gender Responsiveness Action Tool (GReACT)

The purpose of this tool is to help implementing partners plan, implement and monitor their interventions in a gender-responsive manner. Activities have been grouped according to "type": e.g., assessments, training, policy advisory, etc. For each type of **activity**, this tool provides an indication of associated gender responsive **objectives** and gender-responsive **actions** to be taken in preparing and implementing these activities. The actions are further illustrated with examples of concrete methods to carry them out.

Activities - by type	**Gender responsive objectives** *What gender equality objectives will this type of activity support?*	**Ex-ante gender-responsive action:** *Is this activity being planned/implemented in a gender responsive way? Three or more actions are suggested for each type of activity.* *For each activity, the following monitoring scale will be used in reporting:* ***High gender responsiveness:** three or more actions are carried out.* ***Medium gender responsiveness**: two out of three actions are carried out.* ***Low gender responsiveness:** only one action is carried out.*	**Practical methods** **(examples)** *What are some specific methods/mechanisms to do this?*	**Ex-post Learning:** *Was the activity successfully implemented in a gender-responsive manner? How, why or why not?* *Are there outcomes or early signs of impact that can be attributed (at least in part) to implementing this activity in a gender-responsive way?*

Assessments (e.g., institutional & legal reviews water governance and water diplomacy capacity needs, technical studies such as e-flow assessments, etc.)	• Specific perspectives, practices and needs of women are explicitly assessed alongside or within broader assessment objectives • Specific barriers to women's involvement in or benefit from actions is identified and included in assessment	• Assessment incorporates gender responsive methods to e.g. disaggregate women and men's perspectives, needs, practices, institutional participation, etc. • Address/analyse main assessment question overall *and* through a gender equality lens, i.e. by considering what gender responsiveness issues need to be specifically addressed. • Assessment makes recommendations on gender-responsive interventions, including to overcome historical gender	• Use/ Apply UN WWAP Indicators when possible[22] • Convene women's focus groups to collect qualitative data. • Conduct sex-disaggregated data collection and gender analysis	Monitor gender-responsiveness of assessment report: did the assessment meet both actions?

[22] Seager, J. "Sex-disaggregated indicators for water assessment, monitoring and reporting," Technical Paper, Gender and Water Series, UN World Water Assessment Programme, Paris, UNESCO (2015); can be found at: http://unesdoc.unesco.org/images/0023/002340/234082e.pdf

	• Women's knowledge is tapped to inform assessments	biases/gender-based barriers and to advance women's empowerment and gender equality.		
Establishing/strengthening local, national and bi-national formal or informal institutions (e.g., basin Commissions, bi-national or transboundary mechanisms/platforms, national basin institutions/platforms, Water user associations, etc.)	• Women's representation and meaningful participation is ensured/promoted • Women's access to and use of the resource are treated equitably with those of men; women's control over resources is considered, [and enhanced?] in comparison to men's. • Women's informal/formal institutions are also considered	• Understand existing obstacles, if any, to women's representation and meaningful participation in local, national and bi-national formal and informal institutions • Assist in developing statutes that ensure representation of women in governance structures • Assist in developing rules and procedures that ensure women's active participation in consultation, planning and deliberation processes, (including for example through liaising with women's groups/networks)	• Conduct focus group interviews with women and men to learn about potential obstacles, if any, to women's representation and meaningful participation (…) • Identify, through interviews and observation, women with leadership abilities in the relevant setting/context • Invite women and in particular, identified women leaders, as well as gender champions, to any relevant meetings convened through BRIDGE • Organise consultations among women on how to develop rules and procedures that will be	Monitor women's experience of collaborative planning activities: did they feel appropriately consulted, included, represented, was their voice heard? Did participation increase? Was it sustained?

			conducive to women's active participation in (…)	
Collaborative planning, dialogue and strategic partnership activities (e.g., multi-stakeholder technical or strategic consultations, elaboration of participatory development strategic plans, project formulation, water financing)	• Women's representation and meaningful participation is ensured/promoted • Women's access to, use of, and control over the resource are treated equitably with those of men	• Ensure that women and women's groups are invited to participate • Include gender issues and gender-responsive planning in the agenda, explicitly (e.g., what issues/barriers do women face, and how can planning avoid exacerbating gender inequities and overcome gender barriers) • Support women's participation in decision-making processes	• When facilitating, actively encourage women to speak and share their perspectives • Identify, through interviews and observation, women with leadership abilities in the relevant setting/context • Invite women and in particular, identified women leaders, including gender champions, to any relevant meetings convened through BRIDGE	Monitor women's experience of collaborative planning activities: did they feel appropriately consulted, included, represented, was their voice heard?
Training workshops and events (e.g., water governance, international water law, benefit sharing, hydrodiplomacy and negotiations, Champions capacity building and leadership skills, training for	• Women's representation and meaningful participation is ensured/fostered • Effective training of women on equal footing with men	• Ensure that women and women's groups are invited to participate • Ensure that training is socio-culturally appropriate for women (e.g., a separate women's training might be advisable in some cases) • Explicitly incorporate into training a gender-responsive take on theme at hand	• Design sessions to encourage women's voice: e.g. check whether women-only small group work is more conducive • When facilitating, actively encourage women to speak and	Monitor women's and men's experience of workshops and training events and of gender-responsiveness components: did they feel it was useful, that they were appropriately consulted, included,

trainers, including learning exchanges and study tours)	• A significant percentage (TBD according to context) of trainees are women • Awareness-raising on gender-related concerns at different events, on different sub-topics (e.g., water, forest management, land tenure, value chains, access to finance, etc.).	• When designing training, consider different needs and constraints of women vs. men in adopting new techniques or in changing behaviours	share their perspectives	represented, and was their voice heard?
Advisory support for strengthening and improving cooperation (to e.g., local and bi-national committees and governmental institutions, **technical advice and advisory and support for policy dialogues (**e.g., water governance, water legislation processes, water charters)	• Active participation or women in new partnership opportunities • Women and men benefit from new partnerships promoting WRM, including women entrepreneurs/women-owned businesses. • Awareness-raising on gender-related concerns at different events, on different sub-topics (e.g.,	• Approach and encourage women leaders and women's groups, including women-owned businesses, to engage in forming new partnerships • Target both women and men in leadership positions • Ensure that women's perspectives and gender-specific issues are addressed during design, planning and establishment of cooperation processes • Ensure that the partnership will be beneficial to both men and women equally	• Conduct rapid survey during partnership design to understand how it might affect women and men differently • Encourage uptake of UN WWAP Indicators when possible[23] • Engage women's advocacy groups, women's national networks, etc.	Monitor women's and men's engagement in agreements, including for example how many women-owned businesses or women entrepreneurs are approached/engaged. Monitor policy reforms through a gender lens

[23] Seager, J. "Sex-disaggregated indicators for water assessment, monitoring and reporting," Technical Paper, Gender and Water Series, UN World Water Assessment Programme, Paris, UNESCO (2015); can be found at: http://unesdoc.unesco.org/images/0023/002340/234082e.pdf

	hydro-diplomacy, water governance and management, transboundary cooperation, compliance with existing policy frameworks on gender-environment links etc.). •	• Bring gender-specific learning into specific policy theme at hand • Include equitable participation of women on panels and high profile speaking slots		
Other type of activity (please populate with your additions and suggestions)				

Key proposed indicators:

- % of women in attendance in meetings facilitated by the project and relating to Collaborative planning, dialogue and strategic partnership activities
- % of women in attendance in capacity-building activities and events facilitated by the project
- % of multi-stakeholder meetings facilitated by project and relating to Collaborative planning, dialogue and strategic partnership activities that included a gender-responsiveness session/item in the agenda
- % of capacity-building events facilitated by the project that included a gender-responsiveness session/module in the agenda
- % of women in newly established or strengthened institutions through project interventions
- Intensity of women's participation and contribution to decision-making in project-facilitated decision-making meetings.
- Presence of gender specific objectives and commitments (or gender strategy) in new agreements facilitated by the project.