



MOZAMBIQUE NATIONAL ACTION PLAN FOR THE BUZI, PUNGWE, AND SAVE RIVER BASINS

2025-2034



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However, the views expressed in the publication do not necessarily reflect those of these organizations or any affiliated governments or institutions, and no endorsement is implied. The publication was informed by a comprehensive Transboundary Diagnostic Analysis (TDA) conducted in the BUPUSA river basins, under the same project. The analysis incorporates findings from studies, causal chain analyses, and stakeholder consultations. All literature used in the document is reference and acknowledged in the TDA.

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Global Water Partnership Southern Africa (GWPSA)

Global Water Partnership Southern Africa is one of 13 regional networks that make up GWP, an international network created in 1996 to foster the implementation of integrated water resources management: the coordinated development and management of water, land, and related resources that maximise economic and social welfare without compromising the sustainability of ecosystems and the environment. Global Water Partnership Southern Africa (GWPSA) offers practical support for sustainably managing water resources to 16 countries in the Southern African Development Community (SADC). The network manages activities and convenes stakeholders in this region and at pan-African level to address issues that have an impact on water security.

The Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM)

The Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM) was established on 17 May 2023, in Harare, Zimbabwe. It was launched on 19 July in Beira, Mozambique. The tri-basin institution has oversight on the planning, development, and management of the water resources within the Buzi, Pungwe, and Save (BUPUSA) River Basins, which are exclusively shared by Mozambique and Zimbabwe. The BUPUSA Commission promotes the equitable and sustainable development of the water resources of the Buzi, Pungwe and Save River basins, which are exclusively shared by Mozambique and Zimbabwe. The BUPUSA Commission provides a forum for consultation and coordination between the riparian states to promote integrated water resources management and development within the basins.

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Foreword



The National Action Plan (NAP) for Mozambique is a strategic implementation plan for addressing priority environmental concerns in the Mozambican part of the Buzi, Pungwe, and Save (BUPUSA) basins. The NAP is based on an assessment of the priority environmental concerns as identified by the BUPUSA Transboundary Diagnostic Analysis (TDA) and defines technical and management interventions to address them.

The NAP for the BUPUSA basins was developed through an extensive consultation process in order to ensure that it reflects the priorities of the country. It is well aligned with the country's national development

and sector plans, as well as the institutional frameworks at national and local level.

The NAP is based on an assessment of the priority environmental concerns as identified by the BUPUSA Transboundary Diagnostic Analysis (TDA) and defines technical and management interventions to address them. It is closely aligned with the and will complement the BUPUSA Strategic Action Programme (SAP) and Zimbabwe NAP.

The Mozambique NAP is a critical tool for the implementation of SAP priority actions at national level and the integration of transboundary and basin concerns into the country's national legislative, policy, and budget decision-making processes. The NAPs and SAP are developed for a ten-year planning timespan, with targets set for that period.

We hope that this NAP will shed light on the key issues that need attention in the basins and provide the necessary guidance in addressing them at national level. We implore all BUPUSA stakeholders to support the initiative and proposed interventions for the conservation, sustainable use, and mitigation risk in these shared water resources.

A handwritten signature in blue ink, which appears to read "Messias Macie".

Eng. Messias Macie
BUPUSATEC Co-Chairperson
Mozambique

Acknowledgments

The development of the BUPUSA National Action Plan (NAP) for Mozambique was achieved through a broad-based consultative process involving key stakeholders at the national, and provincial levels. Special acknowledgments are extended to various stakeholders including traditional leaders, civil society organizations, academia, the private sector, local communities, government line ministries and departments, cooperating partners, direct contributors, reviewers, revisers and layout specialists for their contribution to the development of this NAP.

The Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM) would like to express its gratitude and thanks to all the stakeholders who contributed to the process of developing the Mozambique NAP for the BUPUSA-tri basin. The document guides the Mozambique government, stakeholders and interested parties in identifying priority issues in the basin, the causes, and possible interventions and provides a pointer to the investments that will be required to address some of the issues.

The production of the Mozambique NAP would not have been possible without the support of the Global Environment Facility (GEF), which provided a contracting mechanism for the lead author and offered financial and technical support for engaging experts.

We extend our sincere gratitude to the International Union for the Conservation of Nature (IUCN) for providing the technical assistance necessary to engage experts who led the development of various chapters and compiled the information into a comprehensive and dynamic product..

We also appreciate the Global Water Partnership Southern Africa (GWPSA) for providing technical oversight during the development of the TDA. GWPSA also facilitated the involvement of diverse stakeholders to review and provide input into the TDA and oversee the overall management of the development process.

BUPUSACOM is thankful to the governments of Mozambique and Mozambique, which through the Project Steering Committee led by Engineer Macias Macie,

National Director of Water Resource Management in Mozambique's Ministry of Water and his Zimbabwean counterpart Engineer Gilbert Mawere, Technical Committee, representatives from various ministries, departments, and agencies provided tremendous support during the development of this NAP. Their availability for consultations, particularly through workshops conducted during the process, was invaluable in producing the final product.

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The Mozambique NAP could not have reached completion without the dedicated commitment of the various project stakeholders, who are applauded most sincerely for their contributions, the invaluable knowledge, support and collaboration provided by various local and national institutions which include government departments, local authorities, the private sector, civil society, and community leaders is acknowledged and appreciated.

Acronyms

AfDB	African Development Bank
ARA	Administração regional de Águas (regional water authority)
AURA	Autoridade Reguladora de Águas (Water Regulatory Authority)
BUPUSA	Buzi, Pungwe, Save
BUPUSACOM	Buzi, Pungwe, Save Watercourse Commission
BUPUSAWIS	Buzi, Pungwe, and Save Water Information Systems
CNA	Conselho Nacional da Água (National Water Council)
DNAAS	Direcção Nacional de Abastecimento de Água e Saneamento (National Directorate of Water Supply and Sanitation)
DNGRH	Direcção Nacional de Gestão de Recursos Hídricos (Directorate of Water Resources Management)
GEF	Global Environment Facility
GMI	Groundwater Management Institute
GoM	Government of Mozambique
IP	Instituto Público (Public Institute)
IUCN	International Union for Conservation of Nature
IWRM	Integrated Water Resources Management
MADER	Ministério da Agricultura e Segurança Alimentar (Ministry of Agriculture and Rural Development)
MIREME	Ministério dos Recursos Minerais e Energia (Ministry of Mineral Resources and Energy) – Mozambique
MISAU	Ministry of Health
MOPHRH	Ministério das Obras Públicas, Habitação e Recursos Hídricos (Ministry of Public Works, Housing and Water Resources)
MTA	Ministério da Terra e Ambiente (Ministry of Land and Environment)
NAP	National Action Plan
PCN	Project Concept Note
SADC	Southern African Development Community
SAP	Strategic Action Programme
TDA	Transboundary Diagnostic Analysis
WASH	Water, Sanitation and Hygiene



I

Background

1.1 Purpose of the National Action Plan

The National Action Plan (NAP) is a strategic implementation plan for addressing priority environmental concerns in the Mozambican parts of the Buzi, Pungwe, and Save (BUPUSA) basins. It is closely aligned with the BUPUSA Strategic Action Programme (SAP), a programme addressing priority environmental concerns at the basin-wide level, and the corresponding Zimbabwe NAP for the three basins.

The NAP is a critical tool for the implementation of SAP priority actions at national level and the integration of transboundary and basin concerns into national legislative, policy, and budget decision-making processes. The NAPs and SAP are developed for a ten-year planning timespan, with targets set for that period.

The Mozambique NAP for the BUPUSA basins was developed through an extensive consultation process in order to ensure that it reflects the priorities of the country. It is well aligned with the country's national development and sector plans, as well as the institutional frameworks at national and local level.

1.2 Relationship with the Transboundary Diagnostic Analysis, Strategic Action Programme and national development plans

The NAP is based on an assessment of the priority environmental concerns as identified by the BUPUSA Transboundary Diagnostic Analysis (TDA) and defines technical and management interventions to address them. The TDA is a scientific and technical assessment of the priority environmental concerns and shared management issues in the basins. For the priority issues, the analysis identifies the scale and distribution of environmental and socioeconomic impacts at national and basin levels and, through an analysis of the root causes, identifies potential remedial and/or preventative actions.

Like the NAP at national level, the SAP is a negotiated document that provides a basin-wide framework for the implementation of a prioritised set of national and joint transboundary actions and investments. At national level, the (national component of the) SAP initiatives are based on and integrated into the respective NAPs. Neither the NAPs nor the SAP works independently – the SAP reflects basin-wide priorities identified through the TDA/SAP development processes in the Basin States, and the NAPs provide the framework for the national-level implementation.

The economic policies and the policy and legal framework for the management of water and other natural resources in Mozambique are described in the TDA. The NAP is developed to address specific concerns within the Mozambican part of the BUPUSA basins in line with these national guiding documents. The purpose of the NAP is therefore to complement national policies and provide a tool to support resource mobilisation and on-the-ground implementation of national policy objectives.

1.3 Geographic coverage

The Mozambique NAP covers the Mozambican part of the BUPUSA basins. The envisaged targets and proposed interventions for each priority area of concern (as identified and described in the TDA) are presented in this NAP.

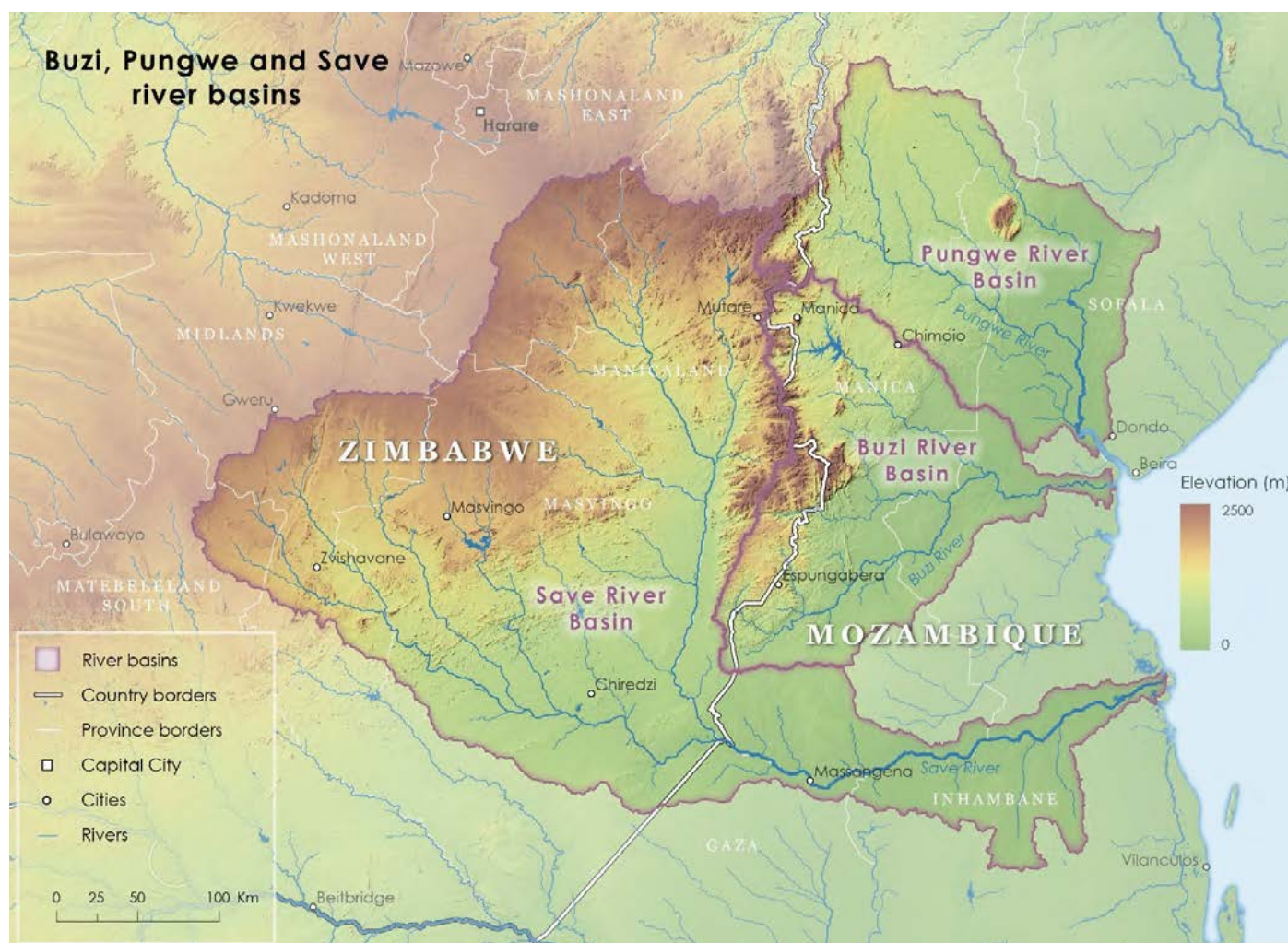


Figure 1: Spatial Map of the BUPUSA Basins. Source GEF BUPUSA Atlas 2024

1.4 National Action Plan structure

The NAP is structured around the five environmental priority areas of concern identified in the TDA. For each environmental priority, socioeconomic intervention was also considered. Through the NAP consultation process, each country prioritised the five areas of concern from its national perspective. In response to each priority area of concern, national targets were set to address these concerns over a ten-year period. Interventions were then identified to meet the targets. In line with national policies, strategies, and plans, project concepts were developed that package the proposed interventions into structured, implementable projects. These Project Concept Notes (PCNs) form the backbone of the NAP.

1.5 National Action Plan development process

The NAP development process involved intersectoral dialogue to achieve integration of water resources management and, most importantly, national endorsement of the NAP. The NAP feeds into the SAP but is an independent planning product and its success depends on receiving the full support of both state and non-state stakeholders.

In practice this means that the political and technical guidance for the NAP comes from the countries, through a NAP Working Group as well as a broader National Stakeholder Forum. While it is part of the

National Stakeholder Forum, the NAP Working Group is smaller in size, comprised mostly of individuals holding positions in government related to water, planning, and finance. With support from the consultant team, the NAP Working Group was primarily responsible for the development of the NAP (and the SAP, together with the NAP Working Group of the other Basin State) and provided the technical and political guidance for the formulation of the NAP.

ers representing a wide range of role-players, including both state and non-state participants. Four workshops of the National Stakeholder Forum were held, in addition to regular meetings of the (smaller) NAP Working Group. Furthermore, the National Stakeholder Platform from the two Basin States met collectively three times throughout the process to ensure synergy between the two NAPs, as well as joint development of the SAP as the basin-wide planning document.

The National Stakeholder Forum consists of stakehold-



Mozambique and Zimbabwe stakeholders at the review workshop for the draft SAP in Chimoio, Mozambique, in May 2024. Photo credit: GEF-BU-PUSA Project.



II

Governance framework

2.1 National legal and policy framework for water and natural resources management

The water sector is governed primarily by the Water Law of 1991 (Law No. 16/91 of 3 August). The approval of the Act started the process of the water sector reforms undertaken by the Government of Mozambique (GoM) in which the government has established for the first time the principles and rules for the management and use of water. Under the Act, the country's water resources, as well as hydraulic structures of public interest, are State property. The Act establishes the legal basis for a river basin approach to water management, with the Ministry of Public Works and Housing being the line Ministry responsible for Water Management. This law gives particular attention to the aspect of environmental sustainability.

The Water Policy, revised in 2015, assigns water resources management functions to basin- and provincial-level organisational structures. It further focuses on promoting environmental conservation and reducing the country's vulnerability to floods and droughts, as well as on the establishment of comprehensive and coordinated management agreements for the promotion of social and economic cohesion and the regional integration of Mozambique. Equally emphasises the concept of Integrated Water Resources Management (IWRM).

Mozambique also adopted a National Strategy for Water Resources Management (approved by the Council of Ministers, August 2007). The strategy highlights the principles of equity and gender balance in the development and implementation of management policies, thus promoting the strengthening of the role of women in the decision-making, planning, monitoring, and management of the water supply system's operation and maintenance.

The Regulation of Water Licences and Concessions, approved by Decree No. 43/2007 of 30 October, was published following the adoption of the National Strategy for Water Resources Management, with the aim of effectively implementing the new water management framework, especially the regulation of water resources management through the licensing or granting of water use rights to natural or legal persons. The regulation assigns to the regional water administrations (ARAs) the responsibility for water use licensing.

The regulation of raw water quality standards and discharges of liquid and solid effluents was approved by Decree No. 52/2023 of 30 August and defines the water quality standards for raw water and effluent discharges, setting the maximum admissible levels for the concentration of pollutants in surface water and groundwater resources.

The Drinking Water Quality Regulations were established by the Ministry of Health through Ministerial Decree No. 180/2004. The regulations aim to ensure the minimum level of drinking water quality by defining water quality parameters and the methods for carrying out appropriate control at different stages of the water supply system, ranging from water abstraction to distribution.

Outside the immediate water legislation, the Environment Law (Law No. 20/97 of 1 October) defines the measures and legal basis for the management and proper use of environmental resources required for the sustainable development of the country. The Environment Law promotes the rational use and management of the environmental components, reinforcing the role of water in the sustainable development of the country. The same law also encourages equality and gender equity in the access and use of natural resources in Mozambique.

The Environment Policy of 1995 was approved by resolution 5/95 of 3 August and responds to article 72 of the Constitution, which defines the right of citizens to an equitable environment and the responsibility to protect it. The policy establishes the foundations for sustainable development in Mozambique, which needs to be met through an acceptable and realistic compromise between socioeconomic development and environmental protection. The policy includes principles such as the sustainable use of natural resources and the polluter pays principle. The Environment Policy further stresses the need to develop sectoral policies to deal with issues related to the high rate of exploration of sub-surface natural resources that may interfere with groundwater quality, the need to establish adequate mechanisms to supervise and monitor changes in the environment, and the quality of natural resources resulting from the impact of the exploration activities, as well as the need for international cooperation with regard to environmental protection.

The Regulation on Environmental Quality and Effluents' Emissions, approved by Decree No. 18/2004, assigned to the Ministry of Land and Environment the responsibility for supervising the permissible concentration of

pollutants in wastewater to be discharged into water-courses. The document established the parameters of water quality assessment, which vary according to the category of water use.

The GoM has approved the Regulation on the Environmental Impact Assessment procedure through Decree No. 45/2004. This regulation specifies the conditions for carrying out environmental impact assessments in public or private activities with potential negative influence on the environment, including projects with characteristics and specific dimensions within the infrastructure, namely transport systems, aqueducts, and canals of water for human consumption or for industrial or other uses, including wastewater treatment facilities.

The Land Policy was approved by resolution 10/95. The policy highlights important principles linked to groundwater, including the sustainable use of natural resources and securing of protection zones. The policy indicates that the right to use the land does not entitle the beneficiary to unlimited exploration of groundwater but allows for the abstraction of sufficient quantities for human consumption and irrigation up to the established limit.

All land in Mozambique is administrated by the government, and all kinds of land uses are governed by the Land Act (1997) and the Land Law Regulations (1998). The National Directorate of Land is responsible for administering and authorising land use rights by dividing the territory of Mozambique into urban and rural areas.

The National Irrigation Policy and its Implementation Strategy were adopted in 2002, recognising the great strategic importance vested with irrigation.

In 2017, a new Master Plan for Disaster Risk Reduction was approved by the Council of Ministers, covering the period 2017-2030. The general objective of this plan is to reduce the risk of disasters and the loss of human lives and vital infrastructure, and to prevent the emergence of new risks of disasters by increasing human and infrastructure resilience in the face of extreme or recurring climatic, natural, and anthropic events.

In the field of climate change and disaster reduction there is the National Climate Change Adaptation and Mitigation Strategy 2013-2025, a government strategy approved in 2012. This strategy establishes guidelines for action to build resilience, including the reduction of climate risks in communities and the national economy, and to promote low-carbon development and green economy, through their integration into the sectoral planning.

In 2019, the Government of Mozambique approved the National Water Resources Management Plan, which highlights the importance of developing structural and non-structural measures for flood management and mitigation. This plan identified about 39 infrastructures for drought and flood management and mitigation in respect of structural measures. However, the plan's implementation depends on the availability of resources. Non-structural measures include the installation of flood early warning systems, flood mapping, land use planning, and improvement of operation of the major dams. To date, most of these actions are dormant because of a lack of financial resources.

In addition to the above, other relevant National Water Legislation consists of:

- Decree 25/91, which determines the entry into force of the National Water Council (CNA – Conselho Nacional da Água);
- Decree 8/96, which alters the composition of the CNA;
- Decree 72/98, which establishes the Framework for Delegated Management;
- Decree 73/98, which establishes the Investment and Assets Fund for Water Supply;
- Decree 29/2017 of 14 July, which establishes the Regulation for the Use and Exploitation of Reservoirs and Lakes;
- Decree 08/2019 of 18 February, which establishes the Water Regulatory Authority (AURA);
- Decree 21/2018, which refines the scope of responsibilities of the ARAs and establishes three new ARAs and Public Institutes (PIs) (ARA-Sul, IP, ARA-Centro, IP, and ARA-Norte, IP);
- Decree 10/2021 of 24 August, which approves the Disaster Management Law; and
- Decree 20/2014 of 18 August, Mining Law which defines the principles for mining exploitation.

2.2 National institutional framework for water and natural resources management

The MOPHRH is the line Ministry responsible for Water Resources Management. Within the Ministry, the National Directorate of Water Resources Management (DNGRH) and the National Directorate of Water Supply and Sanitation (DNAAS) are responsible, respectively, for policy development, including the development of strategies and investment mobilisation for the manage-

ment of water resources, water supply, and sanitation systems in both rural and urban areas. These entities are also responsible for the coordination of the various actors in the sector, participating in the development of legislation, regulations, and technical standards in their respective fields of responsibility, as well as overseeing the decentralisation of sector activities.

Notably, the key responsibilities of the DNAAS include proposing and ensuring the implementation of policies, strategies, rules, regulations, and technical specifications for water supply and sanitation; and promoting investments into the construction, maintenance, and expansion of water supply and sanitation infrastructure.

The DNGRH's primary responsibility in terms of water resources management policy and strategy development is to ensure the availability of water in sufficient quantity and quality for the various water use sectors. This includes sector coordination as well as the monitoring and implementation of legislation and regulations. The strategic planning for disaster situations (droughts or floods) also falls under the responsibility of the directorate. Furthermore, the DNGRH is responsible for the preparation, implementation, and monitoring of basin plans, i.e., overseeing the planning for the use, conservation, and development of the water resources of the country's river basins.

The CNA is the consultative body of the Council of Ministers and is responsible for the inter-ministerial coordination of water management policy and issuing opinions on relevant aspects of the sector policy. The CNA comprises the Ministry of Public Works, Housing and Water Resources (MOPHRH), the Ministry of the Sea, Inland Waters and Fisheries, the Ministry of Foreign Affairs and Cooperation, the Ministry of Industry and Trade, the Ministry of Mineral Resources and Energy (MIREME), the Ministry of State Administration and Public Services, the Ministry of Land and Environment (MTA), the Ministry of Agriculture and Rural Development (MADER), and the Ministry of Health (MISAU).

The regional water administrations, Public Institutes (ARAs, IPs) are public institutions endowed with legal

personality and were established as the entities responsible for water resources management and administration, organised based on regional river basins. Under the supervision of the MOPHRH, through the DNGRH, they are responsible for the operational management and protection of water resources, including the management of the raw water quality monitoring and of the available water resources in river basins, licensing and concession of use, operation of water resources, and implementation of drought and flood early warning systems.

The Provincial Directorate of Public Works, Housing and Water Resources, through the Water and Sanitation Department, represents the MOPHRH at the provincial level. The local water sector planning is the responsibility of the provincial governments, operating under the supervision of Provincial Directorate of Public Works, Housing and Water Resources, which owns the systems for rural water supply and sanitation.

MISAU is the competent authority for the implementation of the Drinking Water Quality Regulations and sets the parameters of water quality for residential or industrial purposes, including food production, from rivers and other water sources up until post-treatment.

The MTA is responsible for monitoring the environmental quality and promoting the development and sustainable use of natural resources, through the implementation of the Regulations on Environmental Quality Standards and Effluent Emissions, as well as for the development and implementation of the NAP to Fight Drought and Desertification in Mozambique, which was initiated by the Ministry for the Coordination of Environmental Affairs and in which the DNGRH was involved.

MIREME performs an important role in water resources management, as it is responsible for the renewable energies sector, which includes hydropower. The Ministry of Education manages the sanitation services of schools, and MADER is responsible for the water supply for agriculture irrigation. Table 1 illustrates different Institutions and their roles/functions in water resources management in Mozambique.

Table 1: Overview of water resources management functions in Mozambique

Functions/Tasks	Mozambique
Formulation of laws and regulations	DNGRH, DNAAS, MTA, MIREME
Water resources management and policies	MOPHRH (DNGRH, DNAAS)
Monitoring of surface water quantity and quality	DNGRH, ARAs, IP, MISAU
Monitoring of groundwater quantity and quality	DNGRH, Aras, IP, MISAU
Water resources classification	DNGRH, ARAs, IP
Water quality standards	MOPHRH (DNGRH, DNAAS), MISAU, MTA (Aqua)
Standards for pollution discharges for classified water resources	DNGRH/MTA
Monitoring of water use and pollution discharge	AQUA, DNGRH, ARAs, IP, DNAAS
Monitoring of drinking water sources and quality, and recreational water quality	DNAAS, MISAU, WATER UTILITIES
Monitoring of meteorological conditions	INAM
Maintenance of water resources databases	DNGRH, ARAs, IP
Development of National Water Program	MOPHRH (DNGRH, DNAAS)
Development of Basin Management Plans	DNGRH, ARAs, IP
Issuance of water use permits	ARAs, IP, DNGRH
Development of rules and procedures for compliance assurance	DNGRH, DNAAS, AURA
Implementation of compliance assurance procedures for regulations and permit conditions	DNGRH, DNAAS, AURA
Supervision of payment of water withdrawal and water discharge fees	ARAs, IP,
Application of penalties and fines	ARAs, IP
Protection of drinking water sources	ARAs, IP
Development of a policy and mechanisms for financing water management	DNGRH, DNAAS
Formulation of agricultural policy and sector plan	National Institute for Irrigation
Management of irrigation and drainage systems	MADER (INIR)
Water system use license and tariffs	DNGRH, DNAAS
Formulation of municipal water supply policy	MOPHRH (DNGRH, DNAAS)
Management of municipal water systems	DNAAS, AIAS, MUNICIPALITY
Operation of municipal water systems	DNAAS, AIAS, MUNICIPALITY
Regulation (issuance of water system use permit and approval of tariffs)	COUNCIL OF MINISTERS
Training and capacity building	All Institutions, except council of Ministers and Public Assembly.

The Basin Committees are the lowest tier of water management organisations. According to Article 20 of the 1991 Water Law, water users may voluntarily organise themselves in Water User Associations/Basin Committees. The Basin Committees are coordination bodies between the users of a basin, irrigation management entities, district governments, and other institutions with a vested interest in water resources use. The aim is to collaboratively optimise the use of water, minimise

the risk of damage, and preserve the environmental balance, to guarantee participatory management of water resources. In the Mozambican part of the BU-PUSA basins the Pungwe Basin Committee, the Buzi Basin Committee, and the Save Basin Committee are all established and are regularly consulted by the ARAs on water resources management issues within their jurisdiction.



2.3 Stakeholder typology

The relevant stakeholders for water resources management in Mozambique are grouped into the following

categories: government/line ministries, civil society, parastatal organisations, and private entities. The table below shows the relevant stakeholders who can play a role for the successful implementation of the NAPs.

Table 2- Relevant Stakeholders

Category	Stakeholders
Government Ministries and Institutions	Ministry of Public Works, Housing and Water Resources (Regional Water Authorities/ National Directorate of Water Resources Management/National Directorate for Water Supply and Sanitation)
	Ministry of Energy and Mineral Resources
	Ministry of Land and Environment
	Ministry of Agriculture and Rural Development
	Ministry of Fishery and Inland Water
	Ministry of Finance
	Ministry of Public Administration
	Ministry of Health
	National Institute of Disaster Management (INGC)
	National Institute of Meteorology (INAM)
	National Fisheries Research Institute
Parastatal organizations	Gorongosa National Park
	Zinave National Park
	Water Supply Utilities (FIPAG Beira and Chimoio)
	Electricity of Mozambique (EDM)
Local Authorities	Massangena, Inhassoro, Govuro, Mabote, Machanga, Gorongosa, Dondo, Chibabava, Buzi, Sussudenga, Catandica, Mussurize, Machaze District Councils
	Chimoio, Beira and Dondo Municipalities
Non-Government Organizations	Global Water Partnership
	UICN
	World Bank
	African Development Bank
Community Based organizations	Basin Committees (Buzi, Pungwe and Save)
	Farmers Associations
	Ajoago
	Natural Resource Management Committees (CRN)
	Local Disaster Risk Committees
	Gold panners Associations
	Fisherman Associations
Private Sector	Mining Companies
	Mafambisse Sugar cane
	Buzi Campany
Research Insitutions	Eduardo Mondlane University
	Zambezi University
	Manica Polytheecbin Institute
	Pungwe University (UniPungwe)
	Licungo University (UniLicungo)



III

Buzi, Pungwe and Save River Basins

3.1 Geographical setting

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

The Buzi River Basin originates in the mountains in east Zimbabwe at an altitude above 3,000 m and extends eastwards to the Mozambican coast through the Man-

ica and Sofala provinces, ending in the Indian Ocean. With a total length of 374 km (20 km of which are in Zimbabwe) the basin has an area of more than 28,800 km², of which 13% is within Zimbabwe and 87% is in Mozambique. The basin comprises three main tributaries, the Buzi River, Rusitu River and Revue River, each flowing from the mountainous areas in the western part of the basin (in Zimbabwe) through the relatively flat plains in the central and lower regions to the east (in Mozambique) before discharging into the Mozambique Channel just west of Beira, where the Buzi forms a large estuary with the Pungwe River (Sweco, 2011).



A bridge at Mucuiane, Mussorize River along the Buzi Basin in Mozambique. Photo Credit: GEF-BUPUSA Project

The Pungwe Basin covers an area of 31,022 km², of which 1,465 km² (4.7%) are in Zimbabwe (generating 24.2% of the mean annual runoff = ~62.1 Mm³), and 29,555 km² (95.3%) are in Mozambique (generating 75.8% of the mean annual runoff; mean annual runoff = ~194.1 Mm³). The Pungwe River is ~414 km long and its source is in the foothills of the Nyanga Mountains, which form the northernmost extent of the Eastern Highlands of Zimbabwe. The river rises below Mount Nyangani, which, at an altitude of 2,592 m above sea level, is the highest mountain in Zimbabwe. The river flows southeastwards through the Honde Valley, crossing into Mozambique near the previously named Katiyo Tea Estate, ~60 km from its source. It then flows through the Mozambican provinces of Manica

and Sofala for ~340 km before reaching the coastal floodplains and estuary. The low-lying and gentle slopes that characterise most of the basin give rise to a wide, meandering river with large floodplains and extensive wetlands. The Pungwe River flows into the Mozambique Channel in the Indian Ocean at Beira Port (Southern Waters, 2023). The principal tributaries of the Pungwe River in Zimbabwe are the Honde River on the right bank and the Nyazengu, Chiteme, Nyamhingura, Nyawamba, Nyamukombe, and Rwera rivers on the left bank. The main tributaries in Mozambique are the Nhazonia, Txatora, Vunduzi, and Urema rivers rising from the north to join the main river on its left bank, and the Honde, Metuchira, and Muda from the south (Southern Waters, 2023).



Pungwe Estuary. Photo: Credit Fiona MacKay

The Save Basin is approximately 102,000 km² in size, with 83% of its total area lying in Zimbabwe and 17% lying in Mozambique (COWI, 2011). In Zimbabwe the Save River Basin covers approximately 22% of the country's land area, comprising two major river systems, the Save River system and the Runde River system. The Save River drains from the northeastern part of the basin while the Runde drains from the western part of the basin. The Save River system originates 65 km

southwest of Marondera town, at an altitude of approximately 1,450 m above sea level in a 600 mm to 700 mm rainfall area. It flows southeastwards for approximately 200 km and then southwards before it joins the Runde River at an altitude of about 500 m above sea level and enters Mozambique. Administratively, the Save Basin straddles the four provinces in Mozambique, namely Sofala, Manica, Gaza, and Inhambane. The following map presents the three basins' geographical extent.



Vila Franca do Save Bridge, Govuro District, along the Save River in Mozambique. Photo Credit: GEF-BUPUSA Project

3.2 Environmental and Socio-economic Conditions in the Buzi, Pungwe and Save Basins

A detailed description of the environmental and socioeconomic conditions in the three basins is provided in the Buzi, Pungwe, Save TDA Report.



IV

Priority areas of concern

The population in the BUPUSA river basins is vulnerable to a combination of social, economic, and environmental factors that interact with climate change. The resulting priority environmental problems identified in the TDA are closely inter-related and share the same underlying driving forces.

4.1 Underlying drivers

4.1.1 POPULATION DYNAMICS

The population in the three river basins is increasing steadily and this, with the concurrent increase in demand for goods and services, is a key driver of change in the basins. Throughout the basins, there is a trend

towards increasing urbanisation associated with population growth and limited alternative livelihood options. Although the population in the basins is still predominantly rural, the urban and peri-urban centres are all growing in size. Increased urbanisation leads to increased demand for services such as water supply and sanitation, which, if not regulated, could for example lead to increased water pollution and over-abstraction of water from the rivers. The coastal and riparian areas in particular are highly susceptible to flooding, both from storm surges accompanying cyclones and flooding from precipitation upstream. The human, material, social, and economic impacts of floods are exacerbated by the increase in human settlements in the buffer zones and floodplains of the rivers and its estuary.



Home gardens planted in the floodplain of the Nhandugue River along the Pungwe river. Here maize, bananas and green leafy vegetables are the main crops grown in the gardens. Photo credit: Gwyn Letley, Anchor Environmental.

The rural communities are also extremely vulnerable to droughts because of reliance on rainfed crops and floodplain agriculture. With the increasing population, there is higher demand for the harvesting of natural resources and for the clearing of new farmland. All these lead to increased land degradation.

4.1.2 LAND USE CHANGE

Land use change is a driving force for changes in sediment dynamics, water quality and abundance and distribution of biota and through de-forestation has impacts on the hydrological regime. Linked strongly to population growth its impact is incremental and

often very difficult to reverse. Despite the relatively low population densities in the three basins, the changes in land use and vegetation cover have been considerable. There is increased demand for land for crops and with an increasing population this trend will only accelerate. Likewise, artisanal mining, especially gold panning, has increased exponentially over the last two decades and contributes significantly to land use change and resulting environmental problems. Overall, the impact of land use change may be more significant than that of increased water use, and its control a more difficult challenge to manage.



Figure 3: Land use change between 2016 and 2023 due to mining in Manica, Mozambique. Source: GEF- BUPUSA Atlas, 2024

4.1.3 POVERTY

Poverty is a feature of the human populations in all three basins and is a key driver for the environmental problems experienced. The basins' economy is fragile, with high levels of poverty. Most of the people living in the basins live in the rural areas, with roughly 70% of the population depending on rainfed agriculture, and high levels of poverty result in maladaptation. As the population increases, so the pressure on natural resources will increase. Increasing deforestation rates, and pasture and land degradation are drivers of vulnerability in the basins. Assuming that the current patterns of use of natural resources remain the same, the pressure on natural resources will increase substantially. This will inevitably lead to further degradation and loss of critical habitats such as the floodplains and riparian woodland as trees are cut for timber and firewood, reedbeds are converted to grazing or agricultural land, and reeds and grasses are cut for household use, baskets, and mat-

ting.

To some extent, such natural resources are sustainable, growing again each year, but if they are overharvested the vegetation may be depleted or lost completely, so that the wider habitat is changed. There is evidence in some parts of the basins that the riparian vegetation has been so changed that it no longer provides the natural resources it used to. It is therefore essential for the rivers to remain in a good condition, since its natural resources are often important 'safety nets' for poor communities in adverse times. It should be noted that while water use developments are aimed at increasing the amount of income coming from the river system, this may not necessarily reduce poverty if the right type of developments are not pursued. The reason is that where developments form part of the formal sector, and particularly where (some or even most of) the economic linkages fall outside the basins, the benefits will be skewed towards high-income segments of society.



Informal settlement of fish farmers along the Pungwe Estuary in Mozambique. Fishing is one of the main sources of livelihoods along the estuary. Photo credit: Fiona MacKay

The poorest elements of resident societies in the three basins have tended to rely on the direct use of natural resources and tended to depend on the fact that access to these resources provides them with a safety net in times of adversity.

It is therefore clear that poverty alleviation in the three basins should be a major investment target for governments, and the ambitious water use development plans inherent in the future development plans suggest that this is the case. Zimbabwe and Mozambique both have national poverty reduction strategies aimed at improving the welfare and living conditions of their populations through increased economic growth.

4.1.4 CLIMATE CHANGE

Climate change projections for the three basins using the Climate Information Portal models generally point towards a drier, warmer future with delayed onset of the rainy season. At the same time, the basins are exposed to tropical cyclones, and the frequency of occurrence over the last 20 years seems to be on the rise. An increase in the occurrence of extreme flood and drought events (and cases of resulting food shortages) is already being observed. It is estimated that in Zimbabwe, the percentage of the population at very high risk of groundwater drought could rise from 32% to 86% without measures being implemented to adapt to the effects of climate change.

Climate change is expected to amplify other existing water resources challenges in the three basins. Non-climatic factors such as unsustainable land and natural resources use, population increase, and others, will add more stress to the water resources in addition to climate variability and change. Initiatives will need to be implemented to help the basins cope with changes in a positive manner. The greater the adaptive capacity, the lower the vulnerability will be, and vice versa.

Initiatives and investments in the three basins should address climate vulnerability linked to social inequities, water insecurity, and environmental degradation, as well as the governance challenges that exist. Investments in adaptation infrastructure are part of the solution, including investment in nature-based solutions to build climate resilience. Investing in water harvesting, storage, and drainage infrastructure will reduce the number of people affected by flooding and droughts. Strengthening communities and institutional capacity and building awareness of climate threats will promote climate-responsive planning and development, and local ownership of solutions, including integration of indigenous knowledge systems. The governance and capacity-building aspect of operationalising adaptation initiatives should therefore also receive adequate attention. Overall, a combination of investment projects and policy and institutional reforms is desired if sustainable and resilient development is to be promoted across sectors and at all levels.



Stranded residents gather on the stands of a stadium in a flooded area of Buzi, central Mozambique, in March 2019 during Cyclone Idai. (Adrien Barbier/AFP/Getty Images)

4.1.5 INSUFFICIENT GOVERNANCE CAPACITY AND TRANSBOUNDARY COORDINATION

The effective sustainable management of the basins is hindered by considerable constraints in institutional capacity and transboundary coordination. These constraints are largely of a structural nature, namely the

fragmentation of management responsibilities across different line function ministries, the lack of intersectoral planning, limited coordination between different spheres of government, weak institutional structures at the local level, and a lack of skills, management capacity, and resources for integrated planning and effective monitoring, implementation, and enforcement.

These aspects are exacerbated by weak structures for transboundary coordination for basin planning, management, and development. The political will for such transboundary coordination is evident in previously ongoing coordination through the Joint Water Commission, and recently the establishment of the Buzi, Pungwe, Save Watercourse Commission (BUPUSACOM).

4.2 ENVIRONMENTAL PRIORITY PROBLEMS

Through the various studies conducted as part of the TDA and regional and national stakeholder consultation processes, five transboundary priority problems were identified as having led to a decline in the ecosystem health and functioning of aquatic ecosystems in the basins.

Table 3: Priority ranking of issues.

Priority issue	Buzi	Pungwe	Save
Land degradation	3	3	3
Deterioration of water quality	2	2	5
Increase in extreme climate events-floods and droughts	1	1	2
Reduced availability of water	5	5	1
Changes in flow regime	4	4	4

1=highest priority; 5 = lowest priority

Table 4: Level of severity of priority issues

Priority issue	Buzi	Pungwe	Save
Land degradation	2	2	3
Deterioration of water quality	3	2	4
Increase in extreme climate events-floods and droughts	2	3	2
Reduced availability of water	4	4	1
Changes in flow regime	4	4	2

1 – severe; 2 – significant; 3 – considerable; 4 - moderate ; 5 - insignificant

A summary description of each of the priority problems is provided in the following sections.

4.2.1 REDUCED AVAILABILITY OF WATER

The water use in the Buzi Basin as a percentage of available surface water and groundwater resources was estimated at 16% in 2020. Irrigation accounts for an estimated 81% of the water demand, followed by water supply for urban centres. Demands are steadily growing, and total demand is estimated to increase to 28% of available surface water and groundwater supplies by 2035. This is slightly above the water allocation agreed

These are:

- reduced availability of water;
- deterioration of water quality;
- land degradation;
- changes in flow regime; and
- increase in extreme climate events – floods and droughts.

Although all the above problems occur in all three BUPUSA basins, their level of priority in comparison to the other problems differs among the three basins. Likewise, the degree of severity of each problem varies among the basins. Table 3 shows a ranking of issues in order of priority for the respective basins and Table 4 indicates the level of severity of the problem for each basin.

in the Water Sharing Agreement for that point in time.

In the Pungwe Basin water use as a percentage of available surface water and groundwater resources was estimated at 28% in 2020 (including environmental flows). Total demand is estimated to increase to 36% of available surface water and groundwater supplies by 2035, which, as in the case of the Buzi, is slightly above the water allocation agreed in the Water Sharing Agreement for that point in time.



A young woman pumps water from the communal borehole in Nhassapa village adjacent to the Nhandugue River in Zone 3 a tributary of the Pungwe Basin in Mozambique. Gwyn Letley, Anchor Environmental.

The water use in the Save Basin as a percentage of available surface water and groundwater resources was estimated at 28% for Mozambique in 2020. By 2035 the water demand will be about 151% of MAR for the whole basin.

In relation to the other priority issues, the problem of reduced availability of water was ranked as the highest priority in the Save Basin, whereas in the Buzi and Pungwe basins it is currently considered the least severe of the five priority problems.

Groundwater is of major importance for most of the rural population in the basins for domestic use, stock watering, and even some small-scale irrigation. The knowledge about the groundwater potential in the basins is improving but is nevertheless still limited and needs to be better understood to determine the potential of the groundwater and how its use could be improved at the local level.

The reduced availability of water leads to a range of environmental and socioeconomic impacts described in detail in the TDA. The causes of reduced availability

of water are partly related to climate change and are otherwise attributable to water use patterns across the key sectors of agriculture, mining, urban and domestic supply and energy, and to insufficient hydraulic infrastructures for water storage.

There is a keen awareness among decision-makers in the Basin States that water demand needs to be managed sustainably, especially in the context of having to account for environmental flows, since increasing use of water in parts of the basins – especially in the high-demand upper basin areas of the Save – affects the balance available for downstream users, including the volumes available to the ecosystems. It is important that the water needs of both Basin States are incorporated into ongoing, joint long-term planning and that at the same time measures are taken to curb the increase in the demand and use of water as efficiently as possible.

A concern in all three basins is the limited understanding of the groundwater resources potential. Rainfall, flow, and groundwater resource monitoring, analysis, and evaluation need to be improved.

4.2.2 DETERIORATION OF WATER QUALITY

The key water quality issues in the three basins are changes in sediment load as a result of erosion caused by inappropriate agricultural practices and (illegal) artisanal mining; eutrophication, primarily linked to increased phosphorus and nitrogen concentrations from agricultural runoff; and contamination with pollutants,

notably heavy metals used in artisanal mining. The impacts and causes of declining water quality in the three basins are summarised in the TDA.

Although the problem of deteriorating water quality is increasingly being recognised as a growing problem throughout the basins, it is currently most severe in the following areas:



The influx of artisanal gold miners in 2000 and the resultant unsustainable gold mining practices since led to deterioration in water quality in the Pungwe River Basin. Photo Credit: Karl Reinecke

Table 5: Water quality degradation hotspot areas

Buzi	Pungwe	Save
Revue River	Honde River	Save River
Lucite River	Nyamukwarara River	
	Pungwe River	

Overall, in relation to other issues, the problem of deteriorating water quality was ranked the second most important issue in the Buzi and Pungwe basins, and the fifth most important in the Save Basin. The relatively low ranking in the Save Basin is, however, not an indication of low severity (the issue in fact has a ranking of considerable severity), but rather an indication that other priority problems are even more pressing.

The causes of the problem are predominantly attributed to three sectors: agriculture, mining, and the urban and domestic sector.

Agricultural return flows containing agrochemicals and seepage from agricultural areas are largely associated with the commercial agriculture sector. This sector is more developed in the upper parts of the three basins in Zimbabwe, but is also prevalent in some pockets in Mozambique. Small-scale and subsistence agriculture contributes significantly to erosion and sedimentation through slash-and-burn practices and the cultivation

of marginal lands not suited for agriculture such as steep slopes and riverbanks. Subsistence agriculture is practised throughout the entire basins. Poor land use practices have increased the rates of wetland loss and soil erosion, resulting in siltation of rivers. Deforestation, uncontrolled bushfires, inadequate cultivation practices in sloping land, destruction of forest for the harvesting of firewood, charcoal, and building material, and for the manufacture of household utensils, have caused the exposure of soils to erosive effects. This often results in excessive accumulation of sediments in river courses, thereby deteriorating the quality of water in river courses and reducing the capacity of soils to retain and infiltrate water into aquifers.

Furthermore, considering a possible increase in the number of people living in the catchments and the possible growth in the demand for wood fuel in the surrounding towns and cities, deforestation could worsen in the future, thereby aggravating the threat of pollution of river courses by suspended sediments.



Charcoal is sold along most of the main roads in Mozambique and is transported to the urban centres where it is the main cooking fuel. Photo credit: Gwyn Letley, Anchor Environmental.

Heavy metal contamination and high sediment loads because of inappropriate mining practices, predominantly related to artisanal gold panning, are a major concern in some parts of the basins. (See table above.)

Inadequate pollution control, wastewater control, and contamination of freshwater resources as a result of inadequate facilities, infrastructure, and maintenance in the urban and domestic sector are issues that need to be addressed in both Basin States.

4.2.3 LAND DEGRADATION

Poor land management practices have altered the conditions of the land, affecting its interactions with water and having far-reaching consequences for the health and integrity of riparian and aquatic ecosystems. Not only is the land less productive, with the subsequent loss of livelihood opportunities, but there are also increased risks of changes in water quality and sediment

loads during local flooding, groundwater recharge, and invasion by alien plants. The causes of land degradation are often the same as the ones contributing to a deterioration in water quality and are largely driven by the same three sectors: agriculture, mining, and urban and domestic.

In areas where the majority of the basin population rely predominantly on agriculture as their main livelihood option, land degradation and the resulting loss of soil capacity are part of a vicious cycle. The degradation of land, coupled with the effects of climate change, results in lower yields and thus reduced income-earning opportunities and food security, especially in the subsistence sector, which is predominant in the basins. As a consequence, people feel forced to expand cultivation into marginal areas such as steep slopes, riverbanks, and wetlands. This in itself is one of the main drivers of land degradation, thereby continuing and aggravating the cycle.



Landslide in Chadzuca village Manica in Mozambique along the Pungwe River, leading to land degradation. Photo Credit: Moses Makwanise, IUCN

The problem of land degradation is considered the third most pressing issue for the Buzi and Pungwe basins, and the second most important one in the Save Basin, with the degrees of severity being significant to severe.

The problem is widespread in the three basins, but certain hot spot areas are particularly affected, as shown in the table below.

Table 6: Land degradation hotspots

Buzi	Pungwe	Save
Sussundega	Manica	Massangena
Machaze	Catandica	Govuro
Chibabava	Gorongosa	Mabote

Addressing the problem of land degradation requires greater integration of development sectors with water and environmental sectors to produce and promote sustainable policies, programmes, and alternative livelihood options. At the policy level, interventions related to agricultural practices need to address the issues of inequitable land tenure.

4.2.4 CHANGES IN FLOW REGIME

The hydrological regime of the Save River has changed significantly, largely as a result of dam development and abstraction. In the Buzi and Pungwe rivers the flow changes are somewhat less severe than in the Save Basin but are expected to worsen with the predicted

increase in water demand. Overall, the issue has been ranked as the third most important in the Save Basin, and the fourth most important in the Buzi and Pungwe basins.

In addition to an overall reduction in flow, the effect of the changes in the hydrological regime is that the pattern of flow is different from that of the natural river and will increasingly be so given the projected increase in water demand. There is less variability in flow from one year to the next and, within the year, there is a less-distinct seasonal pattern. The frequency of smaller floods has also been reduced, with most being absorbed by upstream abstraction and storage.

The reduced volume and timing of water in the system reduces the amount of water to dilute increasing volumes and types of contaminants, and contributes to changes in sediment load and balance and river morphology along its length. This in turn adversely impacts ecosystems and the ecosystem services they provide. By providing opportunities in some areas by ensuring water supply, other options and potential opportunities are lost, especially those reliant on healthy wetland habitats and related natural resources. In addition, direct costs of water treatment, environmental management,

and disease control increase.

- The main sectors linked to the problem are:
- agriculture, particularly irrigation demands for water during the dry season;
- mining, through diversion and disruption of waterways and wetlands; and
- the urban and domestic sector, through increased abstractions, and increased runoff and return flows.

Each of the above-mentioned sectors is associated with the disruption of the natural flow of the river by requiring water at a time of year when, naturally, it would be less available; by contributing extra runoff through return flows when naturally there would be less runoff; and by disrupting waterways and wetlands through physical excavations and constructions. These immediate causes are largely driven by socioeconomic development priorities. Changes to the hydrological regime of the river are intrinsically linked to demand and the development of the river to ensure supply at times when and places where there would otherwise be a shortfall. Although this is essential to maintain and provide opportunities in certain economic sectors such as agriculture, it affects the overall health of the river, and reduces opportunities dependent on a healthy and well-functioning environment.



Changes in flow regime at Mucuiane, Mussorize River, in the Buzi Basin due to upstream commitments. Photo Credit: GEF-BUPUSA Project

4.2.5 INCREASE IN EXTREME CLIMATE EVENTS – FLOODS AND DROUGHTS

The three basins are prone to heavy rains and flooding during the rainy season (between October and April) but also to dry spells and drought in the dry season because of water scarcity arising from poor water management and high evaporation (1,800 to 2,000 mm/year in the Save Basin, and 1,100 to 1,400 mm/year in the Buzi and Pungwe basins). These high evapotranspiration rates substantially affect the availability of water resources, particularly in surface water bodies. Most dams will lose about 10% to 20% a year of the water stored as a result of evaporation, thereby reducing the reliable water yield. As described in the previous sections, that area is also affected by overexploitation of natural resources, land degradation, soil erosion, deforestation, invasion of water hyacinth, and pollution from industry and commercial farming.

Climate change is expected to amplify existing water resources challenges in the basin. Increased temperatures, decreased and late-onset rainfall, and decreased total flows can be expected in the tri-basin under the most probable emission scenarios. Although this points towards a drier future, it is expected to still be characterised by sporadic and increasingly frequent extreme climate events such as severe flooding. Non-climatic

factors such as land use, population growth, development, and other factors will add more stress to the water resources in addition to climate variability and change. Initiatives will need to be implemented to help the basin cope with changes in a positive manner. The greater the adaptive capacity, the lower the vulnerability, and the lower the adaptive capacity, the greater the vulnerability.

For floods, the main hot spot areas identified are the low-lying areas in Mozambique, especially in these areas:

- Buzi Basin: Buzi village, Dombe, Estaquinha, Grudja, Guara-Guara, Chimanimani;
- Pungwe Basin: Tica and Metuchira and the Beira floodplains; and
- Save Basin: Mambone and Machanga villages.

The drought risk is especially severe in Machaze, Mossurize, Govuro, and part of Machanga districts.

With subsistence agriculture being rainfed and highly dependent on natural resources that may be decreased or degraded as a result of climate change, coupled with high poverty levels and low education/literacy, people's options for making agricultural activities more climate-resilient are limited.



In the most vulnerable communities in Mozambique, subsistence farming is the primary way that people survive. With little rain, the crops have been unable to grow properly, leaving families with little to survive on. Photo credit: Hands at work.



Interventions and investments addressing the priority problems in Buzi, Pungwe and Save

Table 7: Priority Area 1

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/programmes
Environmental Priority Interventions					
Priority Area 1: Increase in extreme climate events – floods and droughts					
Objective: The climate resilience of the basin population is strengthened.					
Target 1: Improved forecasting and early warning systems established	Operationalise and implement the flood and drought forecasting and early warning system	Buzi/Pungwe and Save	Moz NAP PCN 1: Strengthening climate resilience in the BUPUSA basins in conjunction with SAP PCN 7: Strengthening Climate resilience in the BUPUSA basins, and Zim NAP PCN 1: Strengthening climate resilience in the BUPUSA basins	- Management of competing water uses and associated ecosystems in Pungwe, Buzi, and Save basins (GEF BUPUSA Project). - Community-focused Flood Early Warning System for the Buzi-Pungwe and Save (UNESCO Project) - Integrated Platform for the Dissemination and Communication of Flood and Cyclone Early Warning Information. - Local Disaster Risk Committees. - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/World Bank) - BLUE DEAL Project - Regional Climate Resilience Program for Eastern & Southern Africa - Contingency Plans - National Climate Outlook Forum (NACOF)	- Disaster Risk Reduction Master Plan - Mozambique Water Resources Master Plan (GoM, 2019) - Buzi IWRM Strategy - Pungwe IWRM Strategy - Save IWRM Strategy
	Establish community-led flood and drought management systems in vulnerable areas	Buzi/Pungwe and Save			
	Rehabilitate, densify, and upgrade the hydro-climatological and communication network and integrate it with the Buzi, Pungwe, and Save Water Resources Information Systems (BUPUSAWIS)	Buzi/Pungwe and Save			
	Develop and implement the BUPUSAWIS and operationalise the Data Sharing Protocol	Buzi/Pungwe and Save			
Target 2: Climate adaptation and mitigation strategy developed	Develop a basin wide Climate Mitigation and Adaptation Action Plan	Buzi/Pungwe and Save		- Management of competing water uses and associated ecosystems in Pungwe, Buzi, and Save basins (GEF BUPUSA Project); - Community-focused Flood Early Warning System for the Buzi-Pungwe and Save (UNESCO Project) - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/World Bank) - Reforestation Strategy	- Mozambique Climate Change Strategy (GoM, 2012). - Mozambique Water Resources Master Plan (GoM, 2019) - Joint Programme on Environment Mainstreaming and Adaptation to Climate Change in Mozambique - Buzi IWRM Strategy - Pungwe IWRM Strategy - Save IWRM Strategy
	Develop/review and update Disaster Risk Management Plans	Buzi/Pungwe and Save			
	Establish community-based climate information services	Buzi/Pungwe and Save			
Target 3: Climate adaptation and mitigation strategy implemented	Implement appropriate water infrastructure projects and associated technologies (including IKS) for poverty alleviation and climate resilience	Buzi/Pungwe and Save		- Management of competing water uses and associated ecosystems in Pungwe, Buzi, and Save basins (GEF BUPUSA Project); - Community-focused Flood Early Warning System for the Buzi-Pungwe and Save (UNESCO Project) - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/World Bank) (DNGRH/WB) - Reforestation Strategy - Construction of excavated reservoirs)	- Mozambique Climate Change Strategy (GoM, 2012). - Mozambique Water Resources Master Plan (GoM, 2019) - Joint Programme on Environment Mainstreaming and Adaptation to Climate Change in Mozambique - Buzi IWRM Strategy - Pungwe IWRM Strategy - Save IWRM Strategy
	Promote investments in alternative renewable energy sources	Buzi/Pungwe and Save			
	Undertake awareness programmes on climate change	Buzi/Pungwe and Save			

Table 8: Priority Area 2

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 2: Deterioration of water quality					
Objective: The water quality in the basins is maintained at adequate levels for socio-economic development and the functioning of healthy ecosystems.					
Target 1: Water resources quality objectives (both surface and groundwater) are set and a monitoring system is operational	Establish effective and sustainable basin-wide water quality monitoring system (including automated stations) and integrate with BUPUSAWRIS.	Buzi/Pungwe and Save	Moz NAP PCN 2: Improved water quality in the BUPUSA basins in conjunction with SAP PCN 4: Reducing water and environmental pollution in the BUPUSA basins, and Zim NAP PCN 2: Improved water quality in the BUPUSA basins	- ARA Centro, IP and ARA-Sul, IP annual monitoring Plans. - GEF BUPUSA Project through MSc Waternet student research - Regulations on raw water quality standards and fixation of pollution rates - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/ World Bank)	- Mozambique Water Resources Master Plan (GoM, 2019) - Mozambique Water Resources Strategy (GoM, 2007) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007), - Pungwe, Buzi and Save Water sharing agreements - Buzi, Pungwe and Save IWRM Strategies
	Develop water quality decision support system (DSS) and link with BUPUSAWRIS	Buzi/Pungwe and Save			
	Operationalise platforms for cross-sectoral coordination on pollution control. Carry out regular operational research on water quality	Buzi/Pungwe and Save			
Target 2: River health monitoring programme implemented	Implement effective and sustainable river health monitoring programme and integrate results with BUPUSAWIS	Buzi/Pungwe and Save		- GEF BUPUSA Project - Revitalization of the multi-sectoral committee for water quality in the Revue River/Buzi Basin	Sustainable socioeconomic and environmental gold panning in Manica District
	Document and disseminate information on river health status	Buzi/Pungwe and Save			
	Build capacity on river health monitoring	Buzi/Pungwe and Save			
Target 3: Mechanisms for pollution control developed, enforced and implemented	Implement community-based programmes for the rehabilitation of highly degraded water quality hotspots	Buzi and Pungwe		- Establishment of Artisanal Miners Association - Environmental Education Programs - Regulations on raw water quality standards and fixation of pollution rates	- National Water Resources Master Plan (GoM, 2019) - Mozambique National Water Resources Strategy (GoM, 2007) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007) • Water Law • Environmental Law
	Promote environmentally friendly and innovative technology for water quality improvements	Buzi and Pungwe			
	Strengthen WASH infrastructure and initiatives	Buzi and Pungwe			
	Establish a framework for sustainable gold panning and develop alternative livelihoods projects/programmes.	Buzi and Pungwe			

Table 9: Priority Area 3

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 3: Land degradation					
Objective: The basins' land resources are sustainably managed to ensure agricultural productivity and functioning ecosystem services.					
Target 1: Land Use Planning Improved	Develop a strategy for the rehabilitation of degraded areas and reducing sedimentation	Buzi/Pungwe and Save	Moz NAP PCN 3: Sustainable land management in conjunction with SAP PCN 5: Rehabilitation of land degradation hotspots in the BUPUSA basins, and Zim NAP PCN 3: Sustainable land management	- Mozambique - Sustainable Land and Water Resources Management Project - Agriculture and Natural Resource Landscape Management Project (SUSTENTA)	- National Land use Plans - National Reforestation Strategy (GoM, 2006) - Action plan for the prevention and control of soil erosion (GoM, 2007) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007) - District Land Use Plan - Strategic Plans for district development; Land Law
	Review and update the River Basin Plans	Buzi/Pungwe and Save			
	Develop a comprehensive strategy to protect ecologically sensitive areas (e.g., conservancies)	Buzi/Pungwe and Save			
Target 2: Land degradation reversed	Rehabilitate environmental degradation hotspots	Buzi/Pungwe and Save		- Establishment of cooperatives for Gold Panning - Mozambique - Sustainable Land and Water Resources Management Project - Agriculture and Natural Resource Landscape Management Project (SUSTENTA)	- National Land use Plans. - National Reforestation Strategy (GoM, 2006) - Action plan for the prevention and control of soil erosion (GoM, 2007) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007) - District Land Use Plan - Strategic Plans for district development; Land Law
	Promote optimal and sustainable use of land and water resources, e.g Conservation Agriculture	Buzi/Pungwe and Save			
	Strengthen community-based natural resources management practices, through the creation of pilot projects to be upscaled	Buzi/Pungwe and Save			
	Implement alternative livelihood projects to reduce land degradation	Buzi/Pungwe and Save			
	Operationalize land use plans of River basin partial protection zones	Buzi/Pungwe and Save			
	Promote awareness of sustainable water and land-use planning	Buzi/Pungwe and Save			
Target 3: Impact of silt and sediment reduced	Strengthen the capacity of the key institutions in mapping, monitoring and conducting hydrographic surveys/ sediment measurement	Buzi/Pungwe and Save		Community reforestation programmes	- National Land use Plans. - National Reforestation Strategy (GoM, 2006) - Action plan for the prevention and control of soil erosion (GoM, 2007) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007) - District Land Use Plan - Strategic Plans for district development; Land Law
	Undertake research and implement technologies/ innovations to reduce the impact of siltation	Buzi/Pungwe and Save			

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 3: Land degradation					
Objective: The basins' land resources are sustainably managed to ensure agricultural productivity and functioning ecosystem services.					
Target 4: Critical wetlands rehabilitated	Develop effective and sustainable wetland management plans	Buzi/Pungwe and Save	Moz NAP PCN 3: Sustainable land management in conjunction with SAP PCN 5: Rehabilitation of land degradation hotspots in the BUPUSA basins, and Zim NAP PCN 3: Sustainable land management	• GEF BUPUSA Project	• Mangrove National Strategy; National Reforestation Strategy
	Through community involvement, undertake rehabilitation and restoration of degraded wetlands (control of invasive alien species, reseeding and rehabilitation structures)	Buzi/Pungwe and Save			
Target 5: Socio-economic and environmental benefits from vital ecosystems optimized	Characterize and delineate ecologically sensitive ecosystems in the river basin	Buzi/Pungwe and Save		• National Mangrove Restoration Program – Sofala	• Mangrove Management Strategy (GoM, 2020) • Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007)
	Undertake ecosystem services assessments	Buzi/Pungwe and Save			
	Implement community-based natural resources management and livelihoods initiatives	Buzi/Pungwe and Save			

Table 10: Priority Area 4

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 4: Changes in flow regime					
Objective: The adverse effects of the changed hydrological regime mitigated.					
Target 1: Environmental flow regime established and implemented	Undertake comprehensive environmental flow assessments	Buzi/Pungwe and Save	Moz NAP PCN 4: Implementation of Eflows in conjunction with SAP PCN 6: Basin-wide environmental flows regime, and Zim NAP PCN 4: Implementation of Eflows	- River Basin Plans (ARA Centro, IP, ARA-Sul, IP and DNGRH) - GEF BUPUSA Project (Eflows study)	- Buzi , Pungwe and Save Water Sharing Agreements, - Buzi IWRM Strategy, - Pungwe IWRM Strategy - Save IWRM Strategy - Environmental Law - National Water Resources Master Plan (GoM, 2019) - National Reforestation Strategy (GoM, 2009)
	Develop principles and guidelines for environmental flow management	Buzi/Pungwe and Save			
	Improve institutional capacities on upscaling, monitoring, and implementing environmental flow requirements	Buzi/Pungwe and Save			

Table 11: Priority Area 5

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 5: Reduced availability of water					
Objective: The water resources of the basins are developed and managed sustainably for increased socio-economic development and improved livelihoods					
Target 1: Groundwater resource potential established	Characterization / detailed investigation of the occurrence, availability and use of groundwater in the basin, including identification of recharge and discharge zones and hydrogeochemical detailed analysis	Buzi/Pungwe and Save	Moz NAP PCN 5: Conjunctive use of surface- and groundwater in conjunction with SAP PCN 2: Sustainable groundwater management in the BUPUSA basins, and Zim NAP PCN 5: Conjunctive use of surface- and groundwater	- SADC GMI-Mapping Groundwater Dependent Ecosystems) - WASH initiatives under different NGOs (UNICEF, World Vision, etc.) - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/WB)	Mangrove National Strategy; National Reforestation Strategy
	Carry out groundwater vulnerability mapping including the determination of diffuse and point sources of pollution	Buzi/Pungwe and Save			
	Develop groundwater sources and implement conjunctive use schemes	Buzi/Pungwe and Save			
	Improve the development and management of surface and groundwater resources at institutional and community level	Buzi/Pungwe and Save			
Target 2: Conjunctive use options for surface and groundwater implemented	Promote sand aquifer abstraction for optimal socio-economic benefits.	Save		- GEF BUPUSA Project - Regional Climate Resilience Program for Eastern & Southern Africa - We World GVE Project - BLUE DEAL Project - GoM Annual Plan - Introduction of SEBA Software/Data	- Mangrove Management Strategy (GoM, 2020) - Environmental Strategy for the Sustainable Development of Mozambique (GoM, 2007)
	Implement managed aquifer recharge (MAR) in priority locations	Buzi/Pungwe and Save			
Target 3: Improved monitoring and assessment for conjunctive use of surface and groundwater resources	Design, upgrade, and expand a sustainable surface and groundwater monitoring and modelling system	Buzi/Pungwe and Save		- SADC GMI-Mapping Groundwater Dependent Ecosystems - WASH initiatives under different NGOs (UNICEF, World Vision, etc.) - Hydrogeological Mapping Program (World Bank Project/DNGRH) - Regional Climate Resilience Program for Eastern and Southern Africa Project (DNGRH/ World Bank) - SADC GMI-Mapping	
	Strengthen monitoring of water use	Buzi/Pungwe and Save			
	Strengthen database management (water uses, water levels, permits, etc)	Buzi/Pungwe and Save			

Targets	Project concept note	Affected Basin/Basin for Intervention	Project concept note	Ongoing initiatives	Corresponding agreements/ strategies/plans/ programmes
Environmental Priority Interventions					
Priority Area 5: Reduced availability of water					
Objective: The water resources of the basins are developed and managed sustainably for increased socio-economic development and improved livelihoods					
Target 4: Water demand management strategy developed	Develop a water demand management strategy	Save	Moz NAP PCN 6: Water demand management and water use efficiency in conjunction with SAP PCN 3: Improving sustainable water supply for socio-economic development in the BUPUSA basins, and Zim NAP PCN 6: Water demand management and water use efficiency	• Water User Permits	• Save IWRM Strategy; Save Water Sharing Agreement; National Water Resources Strategy; Regulation of Licenses and Concessions
	Support the development of Local Development Plans	Save			
	Develop or update water resources master plans	Save			
Target 5: Water demand management strategy implemented	Promote efficient water use and incentivize best practices (assess and minimize transmission losses)	Save		• Water User Permits	• Save IWRM Strategy; Save Water Sharing Agreement; National Water Resources Strategy; • Regulation of Licenses and Concessions, Raw water Tariff
	Implement pilot projects/ programmes on water use efficiency	Buzi/Pungwe and Save			
	Capacity development on water demand management to relevant institutions	Save			
	Implement programmes to raise public awareness on water use and conservation	Save			
	Regularly review and update water demand projections	Save			
Target 6: Basin water resources security improved	Support infrastructure development (green & grey and for intercatchment transfers) including those identified in Water Sharing Agreements	Buzi/Pungwe and Save		• Construction of excavated reservoirs • WASH Initiatives • National Rural Water and Sanitation Program (PRONASAR)	• Mozambique Water Resources Master Plan (GoM,2019) • Mozambique Water Resources Strategy (2007) • Buzi IWRM Strategy • Pungwe IWRM Strategy • Save IWRM Strategy



VI

National Action Plan implementation, coordination, and monitoring

National Action Plan implementation, coordination, and monitoring

The NAP has been designed as a portfolio of project concepts. Funding is sought for each project, either individually or for a combination of projects. Potential funding sources are primarily national governments, international cooperation partners, and, to some degree, the private sector.

In line with the project approach to the NAP, implementation is not through a central implementation agency responsible for the entire NAP. Instead, implementation is project-specific, and the implementation mechanism is dependent on the requirements of the lead implementing agent for each respective project. A proposed implementation mechanism at the project level is described in each PCN.

Overall coordination and monitoring of the NAP is through the relevant government line ministry or ministries using their established structures and systems. Therefore, close collaboration with BUPUSACOM is necessary to ensure synergy in the coordination and monitoring of the implementation of NAP activities in the two Basin States.





VII

Resource mobilisation



Resource mobilisation

The implementation of the NAP (in conjunction with the SAP) will require considerable financial resources, which are expected to be mobilised on an ongoing basis. The mobilisation of resources follows a staged approach:

1. Some resources are already committed through ongoing projects supporting BU-PUSACOM or national-level initiatives which extend well into the initial five-year period.
2. At the same time, some resources can be mobilised in a relatively short period. This should commence immediately at the beginning of the NAP implementation period and will allow the initiatives funded through these efforts to be completed wholly or partially during the initial cycle. Thereafter, such project-specific resource mobilisation should take place on an ongoing basis throughout every implementation cycle.
3. Some investments, especially for infrastructure or other large-scale programmes, require long-term resource mobilisation efforts. This will require the development of strategic programmes, accompanied by a targeted resource mobilisation strategy. It is likely that in each implementation cycle resource mobilisation takes place for a large programme that will be implemented in the following cycle (or even beyond). The development of such programmes therefore needs to become a permanent feature of the resource mobilisation efforts for the implementation of the NAP.

Annex 1: Project Concept Notes

Table 12: Moz NAP Project Concept Note 1: Strengthening climate resilience in the BUPUSA basins

Core data	
Project number	NAP PCN 1
Project title	Strengthening climate resilience in the BUPUSA basins
SAP priority area	Increase in extreme climate events – floods and droughts
Short description	The project seeks to strengthen climate resilience to floods and droughts in the BUPUSA basins to mitigate the effects of climate change.
Project rationale	
Background	The BUPUSA tri- basin has increasingly been affected by extreme events, especially floods and droughts. Recent studies have pointed to the increasing frequency and intensity of these events, leading to loss of lives and livelihoods. The most recent events include Cyclone Eline (2000), Cyclone Japhet (2003), Cyclone Dineo (2017), Cyclone Idai (2019) Tropical Storm Chalane (2020), Cyclone Eloise (2021), and Cyclone Freddy (2023). Cyclone Idai left more than 800 people dead and resulted in massive destruction of infrastructure. Droughts events are also common in the three basins and are also characterised by increasing frequency and severity, e.g., the 1991, 1992, 1995, 2002, 2003, 2004, 2005, 2007, 2008, 2009, 2015, and 2024 drought events. These events have had extreme impacts on the socioeconomics of riparian communities, mainly extreme poverty and loss of infrastructure. Intergovernmental Panel on Climate Change reports point to a further increase in the frequency and magnitude of these extreme events in the future. Appropriate measures need to be implemented in the basins to safeguard and improve the lives of the communities.
Project Objective	The climate resilience of the BUPUSA basin communities/population is strengthened.
Integration with relevant ongoing projects/ initiatives	A number of initiatives are being carried out in the basins to improve climate resilience. These include: • GEF BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in the Pungwe, Buzi, and Save River Basins • UNESCO Project: Community-focused flood early warning system for the BUPUSA basins • Integrated Platform for the Dissemination and Communication of Early Warning System for Floods and Cyclones • Local Disaster Risk Committees • Regional Climate Resilience Program for Eastern & Southern Africa Project (DNGRH/World Bank) • District Climate Change Adaptation Plans • Improving Local Climate Resilience Program in Mozambique • Strengthen Resilience in Vulnerable Communities in the Coastal Zone in Mozambique • IUCN/CARE Moz: Community-Based Adaptation Project (CBA SCALE+) – Inhambane Province • Construction of excavated reservoirs
Project outcomes	1: Improved forecasting and early warning systems established 2: Climate adaptation and mitigation strategy developed 3: Climate adaptation and mitigation strategy implemented
Technical approach	The project has three inter-related elements, respectively focusing on improving climate forecasting and early warning systems, developing climate adaptation and mitigation strategies, and subsequently implementing such strategies at community levels to strengthen community resilience. Outcome 1: Improved forecasting and early warning systems established complements the recently designed flood and drought forecasting and early warning system by expanding disaster warning systems to drought monitoring and forecasting. A focus will be on the practical implementation of the flood early warning system and drought early warning system for the benefit of basin communities. The outcome will be achieved through the following outputs:

Core data	
Technical approach	Output 1.1: Flood and drought forecasting and early warning system operationalised and implemented Output 1.2: Community-led floods and drought management systems in vulnerable areas established. Output 1.3: Hydro-climatological and communication network rehabilitated, densified, and upgraded, and integrated with BUPUSAWIS Output 1.4: BUPUSAWIS developed and implemented, and Data Sharing Protocol operationalised Outcome 2: Climate adaptation and mitigation strategy developed focuses on the development of a basin-wide climate mitigation plan (in conjunction with SAP PCN 7 – output 1.4) and the development of Disaster Risk Management Plans and community-level climate information services Output 2.1: Basin-wide Climate Mitigation and Adaptation Action Plan developed Output 2.2: Disaster Risk Management Plans developed and/or reviewed and updated Output 2.3: Community-based climate information services established Outcome 3: Climate adaptation and mitigation strategy implemented is geared at implementing the plans developed under Outcome 2 through investments in climate-resilient infrastructure at community level and will be achieved through the following outputs: Output 3.1: Appropriate water infrastructure projects and associated technologies (including Indigenous Knowledge Systems) for poverty alleviation and climate resilience implemented Output 3.2: Investments in alternative renewable energy sources promoted Output 3.3: Awareness programmes on climate change undertaken
Assumptions & risks	The project includes investments in local-level projects, including in the fields of agriculture and energy. There is a risk that such investments could be affected by extreme climate events, i.e., severe floods or prolonged droughts. Likewise, investments in small-scale storage and water harvesting infrastructure could be affected by such events. There is a risk of slow approval of strategic documents, such as adaptation plans and Disaster Risk Management Plans. However, this is a low risk that can be mitigated through the involvement of the authorities from the inception phase.
Implementation	
Project duration	Five years, with potential for expansion in scale and time
Project cost	Ranging from USD 3,000,000 (three million) for pilot sites only to in excess of USD 50,000,000 (50 million) for large-scale investments
Proposed funding sources	GEF
	Adaptation Fund
	Green Climate Fund
	AfDB
	World Bank
	GoM
Implementation mechanism	Dependent on scale and funding arrangement

Table 13: Moz NAP Project Concept Note 2: Improved water quality in the BUPUSA basins

Core data	
Project number	NAP PCN 2
Project title	Reducing water and environmental pollution in the BUPUSA basins
SAP priority area	Deterioration of water quality
Short description	The project seeks to improve the quality of water in the basins affected by anthropogenic activities taking place within the basin.
Project rationale	
Background	The BUPUSA basins have been experiencing rapid deterioration in water quality, particularly over the last 20 years. This has been attributed to several point and non-point sources, including but not limited to the following: gold panning, poor agricultural practices (e.g., stream bank cultivation), poor catchment management (land degradation), poor waste and wastewater management, and other diffuse sources. The increasing deterioration is affecting aquatic ecosystems and benefits derived therefrom. Riparian communities are the worst affected, given their direct dependence on these ecosystems. There are also rising health concerns about riparian communities utilising the deteriorating water resources, e.g., in cases where mercury is being used in gold panning. Improving the water quality in the rivers will restore the aquatic ecosystems as well as the socioeconomic benefits derived from these rivers.
Project Objective	The water quality in the basins is maintained at adequate levels for socioeconomic development and the functioning of healthy ecosystems.
Integration with relevant ongoing projects/ initiatives	• Joint monitoring plans and rehabilitation programmes • Local authorities waste management • Research work, e.g., the GEF BUPUSA Project through MSc WaterNet students • Regulations on raw water quality standards and fixation of pollution rates • Establishment of Artisanal Miners Association • Regional Climate Resilience Program for Eastern & Southern Africa Project (DNGRH/World Bank) • Revitalisation of the multisectoral committee for water quality in the Revue River/Buzi Basin
Project outcomes	1: Water resources quality objectives (both surface water and groundwater) are set and a monitoring system is operational 2: River health monitoring programme implemented 3: Mechanisms for pollution control developed, enforced, and implemented
Technical approach	Outcome 1: Water resources quality objectives (both surface water and groundwater) set and a monitoring system operational aims at improving and subsequently maintaining the level of water quality monitoring in the three basins, and strengthen mechanisms for pollution control. This will be addressed through the following outputs: Output 1.1: Effective and sustainable basin-wide water quality monitoring system established (including automated stations) and integrated with BUPUSAWIS Output 1.2: Water quality Decision Support System developed and linked with BUPUSAWIS Output 1.3: Platforms for cross-sectoral coordination on pollution control operationalised Output 1.4: Regular operational research on water quality carried out Outcome 2: River health monitoring programme implemented complements Outcome 1 by gradually expanding the focus from water quality (only) to a broader, integrated river health monitoring system. It will be achieved through the following outputs: Output 2.1: Effective and sustainable river health monitoring programme implemented and results integrated with BUPUSAWIS Output 2.2: Information on river health status documented and disseminated Output 2.3: Capacity on river health monitoring built Outcome 3: Mechanisms for pollution control developed, enforced, and implemented focuses on community-level interventions to address some of the most pressing causes for water quality degradation in the basin and to rehabilitate particularly degraded areas. As artisanal gold panning is one of the biggest causes of water quality degradation in the basins, an important focus of this intervention is the development and practical implementation of a framework for sustainable gold panning. Output 3.1: Community-based programmes for the rehabilitation of highly degraded water quality hot spots implemented

Core data	
Technical approach	Output 3.2: Environmentally friendly and innovative technology for water quality improvements promoted Output 3.3: WASH infrastructure and initiatives strengthened Output 3.4: Framework for sustainable gold panning developed and alternative livelihoods projects/programmes implemented
Assumptions & risks	The main assumption is that the polluters will embrace the proposed pollution reduction interventions/technology.
	There is a risk of the authorities having inadequate capacity to effectively enforce pollution regulations
Implementation	
Project duration	5 years, with potential for expansion in scale and time
Project cost	Ranging from USD 5,000,000 (five million) for pilot sites only to in excess of USD 10,000,000 (ten million) for large-scale investments
Proposed funding sources	GEF
	Biodiversity Fund
	Source to Sea Fund
	Nature for Water
	AfDB
	World Bank
	GoM
Implementation mechanism	GEF implementing agency: IUCN
	Executing agencies: Global Water Partnership Southern Africa, GoM



The increasing deterioration in water quality is negatively affecting the health of the human and affecting aquatic ecosystems. Improving the water quality in the rivers will restore the aquatic ecosystems as well as the socioeconomic benefits derived from these rivers. Photo credit : Gwyn Letley, Anchor Environmental

Table 14: Moz NAP Project Concept Note 3: Sustainable land management.

Core data	
Project number	NAP PCN 3
Project title	Rehabilitation of land degradation hot spots in the BUPUSA basins
SAP priority area	Land degradation
Short description	The project seeks to reverse land degradation to optimise socioeconomic and environmental benefits for the basin communities.
Project rationale	
Background	The BUPUSA basins have been witnessing increased land degradation mainly because of poor catchment management (e.g., deforestation, timber logging, etc.); poor agricultural practices (stream bank and slope cultivation); veld fires; illegal sand abstraction, etc. This has led to massive loss of soil on productive land, and gully erosion causing siltation in rivers. This has resulted in a loss of dam capacities and soil fertility, leading to a negative impact downstream. Communities benefiting from the basins' resources have suffered huge socioeconomic losses because of a loss of biodiversity.
Project Objective	The basins' land resources are sustainably managed to ensure agricultural productivity and functioning ecosystem services.
Integration with relevant ongoing projects/ initiatives	• Environmental protection (ARAs, DNGRH, Department of Land and Environment) • Soil and water conservation initiatives by the Ministry responsible for Agriculture • GEF BUPUSA Project • IUCN projects • Agriculture and Natural Resources Landscape Management Project • National Reforestation Strategy (GoM, 2006) • Action plan for the prevention and control of soil erosion (GoM, 2007) • District land use plans
Project outcomes	1: Land use planning improved 2: Land degradation reversed 3: Impact of silt and sediment reduced 4: Critical wetlands rehabilitated 5: Socioeconomic and environmental benefits from vital ecosystems optimised
Technical approach	The project focuses on improved land use planning and the rehabilitation of ecosystems and protection of ecosystem services in the most affected geographical areas of the basins. Outcome 1: Land use planning improved is geared at developing the necessary policy and planning framework for the on-the-ground rehabilitation and protection work carried out through subsequent outcomes. The outcome focuses on improved land and catchment planning, and developing strategies for the rehabilitation and protection of particularly critical ecological areas. It will be implemented through the following outputs: Output 1.1: Strategy for the rehabilitation of degraded areas and reducing sedimentation developed Output 1.2: River Basin Plans updated Output 1.3: Comprehensive strategy to protect ecologically sensitive areas (e.g., conservancies) developed Outcome 2: Land use degradation reversed focuses on the rehabilitation of critically degraded hot spot areas on the one hand, and on the other hand developing alternative, livelihood options and embedding non-degrading land use practices in communities. It will be implemented through the following outputs: Output 2.1: Environmental degradation hot spots rehabilitated Output 2.2: Optimal and sustainable use of land and water resources, e.g., conservation agriculture, promoted Output 2.3: Community-based natural resources management practices strengthened and upscaled, through the creation of pilot projects Output 2.4: Alternative livelihood projects to reduce land degradation implemented Output 2.5: Awareness of sustainable water and land use planning promoted Output 2.6: Land use plans of river basin partial protection zones operationalised Outcome 3: Impact of silt and sediment reduced specifically addresses the growing issues of siltation through the following outputs:

Core data	
Technical approach	Output 3.1: Capacity of key institutions in mapping, monitoring, and conducting hydrographic surveys/sediment measurement strengthened Output 3.2: Research undertaken and technologies/innovations implemented to reduce the impact of siltation Outcome 4: Critical wetlands rehabilitated targets the rehabilitation of degraded, critical wetland areas in the basins. This is complemented by developing wetland management plans for future sustainable management and embedding sustainable wetland management practices through community management. Output 4.1: Effective and sustainable wetlands management plans developed Output 4.2: Degraded wetlands rehabilitated/restored through community involvement Outcome 5: Socioeconomic and environmental benefits from vital ecosystems optimised further builds on the strong community management element of the project and focuses on the characterisation and delineation of sensitive ecosystems, and subsequently the assessment and protection of the ecosystem services they provide through community-based natural resources management and livelihood interventions. The outcome will be implemented through the following outputs: Output 5.1: Ecologically sensitive ecosystems in the river basin characterised and delineated Output 5.2: Ecosystem services assessments conducted Output 5.3: Community-based natural resources management and livelihoods initiatives implemented
Assumptions & risks	The government and communities embrace, implement, and upscale the new initiatives. One of the risks may arise from the occurrence of extreme hydrometeorological events such as floods and droughts.
Implementation	
Project duration	Five years, with potential for expansion in scale and time
Project cost	Ranging from USD 5,000,000 (five million) for pilot sites only to in excess of USD 10,000,000 (ten million) for large-scale investments
Proposed funding sources	GEF
	Biodiversity Fund
	AfDB
	World Bank
	GoM
	GEF implementing agency: IUCN
Implementation mechanism	Executing agencies: Global Water Partnership Southern Africa, GoM, BUPUSACOM

Table 15: Moz NAP Project Concept Note 4: Implementation of a basin-wide environmental flows regime

Core data	
Project number	NAP PCN 4
Project title	Implementation of a basin-wide environmental flows regime
SAP priority area	Changes in flow regime
Short description	The project is aimed at carrying out all relevant environmental flows assessments to support the implementation of environmental flows in accordance with the basin agreements. Agreement on the implementation of a basin-wide environmental flows regime will be sought through a consultative process, and mechanisms for implementation and compliance monitoring will be supported.
Project rationale	
Background	The provision of water for the protection of the riverine and estuarine ecosystem – and the control of unwanted consequences of degradation – has long been recognised as a key factor in the management of river basins. Environmental flows assessments for the Pungwe Basin have been carried out, and similar assessments are still to be done for the Buzi and Save basins. There is a need to carry out environmental flows assessments and to develop and implement a basin-wide environmental flows monitoring plan for each of the BUPUSA basins.
Project Objective	The adverse effects of the changed hydrological regime are mitigated.
Integration with relevant ongoing projects/ initiatives	• This project on the environmental flows studies was conducted as part of the GEF-funded project Management of Competing Water Uses and Associated Ecosystems in the Pungwe, Buzi, and Save River Basins. • The IUCN Bridge Programme
Project outcomes	Environmental flows regime established and implemented
Technical approach	Based on existing studies for the Pungwe Basin, and additional studies for the Buzi and Save basins, a suite of basin-wide development scenarios will be developed, covering a range of socioeconomic development options and showcasing the resulting ecosystem protection levels. The scenarios will be presented to the Basin States and agreement on a basin-wide environmental flows regime for implementation will be facilitated through a consultative process. Procedures for the implementation of the agreed basin-wide environmental flows regime will be developed and adopted. Thereafter, the Basin States will be supported in setting up the necessary implementation and compliance monitoring systems required for effective implementation. Particular emphasis is placed on the coordination of national-level activities in order to ensure that a coherent and harmonised basin-wide environmental flows regime is implemented in practice. The following outcome and outputs will be achieved through the project: Outcome 1: Environmental flows regime established and implemented Output 1.1: Comprehensive environmental flows assessments conducted Output 1.2: Principles and guidelines for environmental flows management developed Output 1.3: Institutional capacities on upscaling, monitoring, and implementing environmental flows requirements improved
Assumptions & risks	The main assumption is that there will be a political willingness to implement an agreed environmental flows regime in accordance with the respective watercourse agreements, the agreed basin-wide environmental flows procedures, and national legislation. The main risks to the success of the project are: (i) limited capacity at basin and/or national level; (ii) resulting non-compliance (the risk for political willingness is considered to be low, whereas the risk for capacity constraints hindering effective implementation is medium); and (iii) a long process for integration into the agreements.

Implementation	
Project duration	Five years
Project cost	Estimated USD 5,000,000 (five million)
Proposed funding sources	GEF: The project could potentially be a component of a next-phase GEF-funded SAP implementation project
	Others: Alternatively, the project could be implemented as a stand-alone project with funding from national governments or other International Cooperating Partners
	Biodiversity Fund
Implementation mechanism	To be determined based on the selected approach for implementation. (See proposed funding sources.) Regardless of funding source, the project should be implemented under the auspices of BUPUSACOM. GEF implementing agency: IUCN Executing agencies: Global Water Partnership Southern Africa, GoM



Table 16: Moz NAP Project Concept Note 5: Sustainable groundwater management in the BUPUSA basins

Core data	
Project number	NAP PCN 5
Project title	Sustainable groundwater management in the BUPUSA basins
SAP priority area	Reduced availability of water
Short description	The aim of the project is to ensure the sustainability of rural water supply through enhancing the understanding of groundwater resources in the BUPUSA basins, to determine the potential for sustainable use, to develop sustainable groundwater management approaches, and to undertake protective measures for groundwater resources.
Project rationale	
Background	Groundwater is a critical resource in the BUPUSA basins, with the majority (70%) of the rural population being dependent on local groundwater resources for household water supply and livelihoods (e.g., livestock stock watering, small-scale gardening, and farming). The full potential for sustainable use of groundwater in the BUPUSA basins is not yet comprehensively understood. Improved knowledge of the resource is required to inform improved protective measures for groundwater and groundwater management approaches that ensure the long-term sustainability of the resource.
Project Objective	Water security of rural populations improved through protection and sustainable management of groundwater resources.
Integration with relevant ongoing projects/ initiatives	- The project builds on preliminary work carried out by the SADC-GMI for the GEF-funded project Management of Competing Water Uses and Associated Ecosystems in the Pungwe, Buzi, and Save River Basins. The project aligns with ongoing national government activities related to groundwater assessment and exploitation. - Regional Climate Resilience Program for Eastern & Southern Africa Project (DNGRH/World Bank)
Project outcomes	1: Groundwater resource potential established 2: Conjunctive use options for surface water and groundwater implemented 3: Improved monitoring and assessment for conjunctive use of surface water and groundwater resources
Technical approach	Outcome 1: Groundwater resource potential established aims at improving the understanding of the basins' groundwater resources through a detailed mapping that informs the subsequent development of groundwater resource plans that set the framework for sustainable groundwater use planning and exploitation. The outcome has the following outputs: Output 1.1: Groundwater occurrence, availability (recharge and discharge zones), hydrogeochemical, and use in the basins characterised Output 1.2: Groundwater vulnerability mapped and pollution sources determined Outcome 2: Conjunctive use options for surface water and groundwater implemented focuses on practical aquifer management interventions, including the development of conjunctive groundwater use schemes at community level and managed aquifer recharge. It will be implemented through the following outputs: Output 2.1: Groundwater sources developed and conjunctive use schemes implemented Output 2.2: Development and management of surface water and groundwater resources at institutional and community level improved Output 2.3: Sand aquifer abstraction for optimal socioeconomic benefits promoted Output 2.4: Managed aquifer recharge in priority locations implemented Outcome 3: Improved monitoring and assessment for conjunctive use of surface water and groundwater resources supports the preceding two outcomes by strengthening groundwater monitoring and modelling systems, and the capacity for sustainable long-term planning of conjunctive surface water and groundwater use. Output 3.1: Surface water and groundwater monitoring and modelling system designed, upgraded, and sustained Output 3.2: Monitoring of water use strengthened Output 3.3: Database management (water uses, water levels, permits, etc.) improved
Assumptions & risks	The key assumption is that there are adequate groundwater resources to support socioeconomic development and monitoring programmes.

Core data	
Assumptions & risks	The main risk is that there may be low groundwater potential to support the needs of targeted communities. The risk of saline water intrusion will make investments in groundwater expensive, hence resulting in low adoption of technologies.
Implementation	
Project duration	Four years
Project cost	Estimated USD 10,000,000 (ten million)
Proposed funding sources	World Bank
	AfDB
	GoZ
Implementation mechanism	Depends on the funding mechanism



Table 17: Moz NAP Project Concept Note 6: Improving water security for socio-economic development in the Buzi, Pungwe and Save River Basins

Core data	
Project number	NAP PCN 6
Project title	Improving water security for socioeconomic development in the BUPUSA basins
SAP priority area	Reduced availability of water
Short description	The project aims to improve water availability through improved water demand management and water use efficiency in the BUPUSA basins.
Project rationale	
Background	Water is finite. The demand for water in the basins over the years has been on the increase. Recent studies in the BUPUSA basins indicate an increasing population, without corresponding development of water infrastructure. The situation is being exacerbated by the increase in the frequency and magnitude of droughts. This is leading to a decrease in water resources availability, and this greatly affects the rural population whose lives are heavily dependent on water resources availability for domestic use. One way of improving the reliability of water supply is through the application of appropriate water demand management principles and improved water use efficiency.
Project Objective	Improved water resources security in the basins.
Integration with relevant ongoing projects/ initiatives	- The project aligns with ongoing national government activities related to policing (Water Resources Master Plan, National Water Policy and National Water Strategy); water allocation and decentralisation of water provision services (concession and licences systems by ARAs and DNGRH; rationing by local authorities; conservation (climate-smart agriculture); and environmental flows requirements - It also aligns with International Water Sharing Agreements' commitments for the BUPUSA river basins by Mozambique
Project outcomes	1: Water demand management strategy developed 2: Water demand management strategy implemented 3: Basin water resources security improved
Technical approach	The project focuses on ensuring sustainable water supply through a dual approach of improving water use efficiency through a combination of operational and regulatory measures, and investments in water supply infrastructure. Outcome 1: Water demand management framework developed focuses on planning interventions to create an enabling environment for the implementation of water demand management interventions and has the following outputs: Output 1.1: Water demand management strategy developed Output 1.2: Development of local development plans supported Output 1.3: Water Resources Master Plans developed and/or updated Outcome 2: Water demand management strategy implemented builds on the preceding outcome and focuses on practical interventions aimed at strengthening water demand management capacity and the implementation in practice of demand management and water use efficiency interventions. It will be implemented through the following outputs: Output 2.1: Efficient water use promoted and best practices incentivised (assess and minimise transmission losses) Output 2.2: Pilot projects/programmes on water use efficiency implemented Output 2.3: Capacity of relevant institutions for water demand management developed Output 2.4: Programmes to raise public awareness on water use and conservation implemented Output 2.5: Water demand projections regularly reviewed and updated Outcome 3: Basin water resources security improved is directed at infrastructure. It has a dual focus on developing, where necessary, new water supply infrastructure, and optimising the use of existing infrastructure, especially through the synchronisation of dam infrastructure in the Save Basin. Output 3.1: Infrastructure development (green and grey, and for intercatchment transfers) supported, including those identified in Water Sharing Agreements Output 3.2: Dam operations in the Save Basin synchronised

Core data	
Assumptions & risks	The Water Demand Management Strategy will be mainstreamed and implemented. The technology for water use efficiency will be embraced and applied. There is the risk that there will be a long process in mainstreaming the proposed interventions.
Implementation	
Project duration	Five years
Project cost	Estimated USD 5,000,000 (five million) and in excess of USD 10,000,000 (ten million) for large-scale investments
Proposed funding sources	World Bank
	AfDB
	GoM
Implementation mechanism	Dependent on funding mechanism





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