STRATEGIC ACTION PROGRAMME FOR THE BUZI, PUNGWE, AND SAVE WATERCOURSES

2025-2034

BUPUSACOM ESTABLISHED 2023

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Disclaimer:

The Buzi, Pungwe, and Save River Basins Strategic Action Programme was developed under the “Management of competing water uses and associated ecosystems in Pungwe, Buzi, and Save Basins”. The project is funded by the Global Environment Facility (GEF), implemented by the International Union for the Conservation of Nature (IUCN), with Global Water Partnership Southern Africa (GWPSA) as the regional executing partner supporting the basin’s member states (Mozambique and Zimbabwe).

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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The International Union for Conservation of Nature is an international organization working in the field of nature conservation and sustainable use of natural resources. The International Union for Conservation of Nature (IUCN) is a membership Union uniquely composed of both government and civil society organisations. By harnessing the experience, resources and reach of its more than 1,400 Member organisations and the input of some 16,000 experts, IUCN is the global authority on the status of the natural world and the measures needed to safeguard it. Working with many partners and supporters, IUCN implements a large and diverse portfolio of conservation projects worldwide. These projects combine the latest science with traditional knowledge of local communities to work to reverse habitat loss, restore ecosystems and improve people's well-being.

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.

Endorsement

The Strategic Action Programme for the Buzi, Pungwe, and Save Watercourses was endorsed by the Ministers responsible for water for Zimbabwe and Mozambique.

Signed at **Maputo, Mozambique** on this **29th** day of **November 2024**

Hon. Dr. Anxious Jongwe Masuka

Minister of Lands, Agriculture, Fisheries,
Water and Rural Development

Zimbabwe

Honourable Minister

Mr Carlos Alberto Fortes Mesquita

Minister of Public Works, Housing and Water Resources

Mozambique

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Foreword

The BUPUSA Tri-Basin consists of the following shared river basins: the Buzi River Basin; the Pungwe River Basin, and the Save River Basin. The Buzi River originates in the Eastern Highlands on the border of Mozambique and Zimbabwe and flows eastward through Manica and Sofala provinces of Mozambique. The Pungwe River originates in the eastern highlands of Zimbabwe and flows in a general easterly direction through Mozambique into the Indian Ocean. The Save River runs from Zimbabwe and discharges into the Indian Ocean in Mozambique. These three basins are located along the Beira corridor, an important economic corridor that links the Beira harbour to the hinterland.

Populations in the tri basin are boldly tackling escalating social, economic, and environmental challenges. In 2023, the two governments launched the Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM) under cooperation agreements aligned with the SADC Revised Protocol on Shared Watercourses of 2000, to spearhead a united response to the challenges that have been intensified by climate change and resource mismanagement.

To provide a shared understanding of the basins, Global Water Partnership Southern Africa commissioned the development of a Transboundary Diagnostic Analysis (TDA) for the BUPUSA Tri basin. The TDA was developed under the "Management of competing water uses and associated ecosystems in Pungwe, Buzi and Save Basins (GEF-BUPUSA) Project. The project is funded by the Global Environmental Facility and being supported by the International Union for the Conservation of Nature (IUCN) as the GEF Implementing Agency. The Global Water Partnership Southern Africa is the Project Executing Agency supporting the Governments of Mozambique and Zimbabwe.

The highly consultative TDA process identified the five key transboundary environmental problems adversely affecting aquatic and terrestrial ecosystems, livelihoods, and socioeconomic conditions. These are reduced availability of water, deterioration of water quality, land degradation, changes in flow regime, and increase in extreme climate events.

The analysis identified five underlying drivers that contribute to all the above-mentioned priority environmental problems, which are reduced availability of water, deterioration of water quality, land degradation, changes in flow regime, and an increase in extreme climate events.

The challenges identified in through the TDA formed the basis for the development of the Strategic Action Program (SAP) The SAP consists of priority interventions and investments to address the problems identified by the TDA at the transboundary level. The basins' NAPs will complement the SAP in addressing the gaps identified in the CCA at the national level while providing interventions geared towards improving Integrated Water Resources Management (IWRM).

A negotiated document, the Buzi, Pungwe, Save (BUPUSA) Strategic Action Programme (SAP) provides a basin-wide framework for the implementation of a prioritised set of national and joint transboundary actions and investments to address jointly agreed priority environmental concerns in the BUPUSA basins. It is structured around the five environmental priority areas of concern identified in the TDA and the two overarching areas of Transboundary Governance, and Socio-economic Development and Poverty Reduction. It contains seven priority interventions for the basins.

The SAP emphasizes the need for a structured, coordinated, and integrated approach to remedying the challenges identified in the basin. The SAP will be implemented alongside the National Action Plans (NAPs), developed under the GEF- BUPUSA Project. The basins' NAPs will complement the SAP in addressing the gaps identified in the CCA at the national level while providing interventions geared towards improving Integrated Water Resources Management (IWRM).

Overall coordination and monitoring of the SAP and NAPs is through BUPUSACOM, in conjunction with the relevant government line ministry or ministries, using their established structures and systems. The implementation of both the SAP and NAPs will require ongoing and combined resource mobilization efforts of multiple role players, including Member States, regional organisations. A detailed resource mobilization strategy will accompany the documents.

Eng. Tinayeshe Mutazu
BUPUSATEC Co-Chairperson
Zimbabwe

Eng. Messias Macie
BUPUSATEC Co-Chairperson
Mozambique

Acknowledgements

The development of the Strategic Action Programme (SAP) 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 SAP.

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 SAP for the BUPUSA-tri basin. The document guides the two governments, 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 development of the SAP 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 guiding the BUPUSACOM Secretariat in identifying key stakeholders to target through the consultation process, thereby enhancing stakeholder ownership of the final product. GWPSA facilitated the involvement of diverse stakeholders to review and provide input into the TDA and oversee the overall management of the development process. By building on this vision, GWPSA contracted authors and provided oversight throughout the entire development process.

BUPUSACOM is thankful to the governments of Mozambique and Zimbabwe, which through the Project Steering Committee led by Engineer Messias 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 TDA. Their availability for consultations, particularly through workshops conducted during the process, was invaluable in producing the final product.

The SAP is the product rigorous work by a dedicated team of experts and specialists from the region under the overall guidance of Mr Daniel Malzbender. These experts contributed to the basin, groundwater, and country reports, and the multidisciplinary research and spearheaded the development of various chapters and collated the information into the TDA which forms the basis for this SAP and the National Action Plans (NAPS) for the two riparian states.

The development of the SAP could not have been achieved without the day-to-day project management and coordination jointly undertaken by the GEF- BUPUSA Project Management (PMU). IUCN's Regional Programme Manager for Integrated Water Resources Management, Mr Davison Saruchera and GWPSA's leadership composed of Executive Secretary, Mr Alex Simalabwi, Senior Technical Advisor, Mr Andrew Takawira and Dr Loreen Katiyo, the Transboundary Lead from GWPSA, provided immense leadership to the PMU composed of Dr Pinimidzai Sithole, Miss Leticia Ngorima, and the Project Implementation Unit (PIU).

To the Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM) Secretariat, heartfelt gratitude is addressed to Mr Elisha Madamombe, the Interim Executive Secretary and his team, who were also the Project Implementation Unit and consisted of Mr Alfred Misi, Mr Farai Kwenda, Mr Jose Alvaro Malanco and Mr Moises Mavaringana.

The SAP 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.

Heartfelt gratitude is also relayed to the communities of the Buzi, Pungwe, and Save River Basins for their gracious patience and collaboration with the numerous researchers who visited the communities. The aspirations and expectations of all stakeholders for the sustainable management of the Buzi, Pungwe and Save Tri basin are cherished.

Acronyms

ARA	Administração Regional de Águas (regional water administration) – Mozambique
BUPUSA	Buzi, Pungwe, Save
BUPUSACOM	Buzi, Pungwe, and Save Watercourses Commission
CC	Catchment Councils – Zimbabwe
CNA	Conselho Nacional da Água (National Water Council) – Mozambique
DNAAS	Direcção Nacional de Abastecimento de Água e Saneamento (National Directorate of Water Supply and Sanitation) – Mozambique
DNGRH	Direcção Nacional de Gestão de Recursos Hídricos (National Directorate of Water Resources Management) – Mozambique
EMA	Environmental Management Agency – Zimbabwe
GCF	Green Climate Fund
GEF	Global Environment Facility
GMI	Groundwater Management Institute
IP	Instituto Público (Public Institute) – Mozambique
IWRM	Integrated Water Resources Management
JWC	Joint Water Commission
MIREME	Ministério dos Recursos Minerais e Energia (Ministry of Mineral Resources and Energy) – Mozambique
MOPHRH	Ministério das Obras Públicas, Habitação e Recursos Hídricos (Ministry of Public Works, Housing and Water Resources) – Mozambique
NAP	National Action Plan
NDS	National Development Strategy – Zimbabwe
PCN	Project Concept Note
RDC	Rural District Council – Zimbabwe
SADC	Southern African Development Community
SAP	Strategic Action Programme
SCC	Sub-Catchment Council – Zimbabwe
TDA	Transboundary Diagnostic Analysis
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WASH	Water, Sanitation and Hygiene
WIS	Water Information System
ZINWA	Zimbabwe National Water Authority

I Background

1.1 Purpose of the Strategic Action Programme

The Buzi, Pungwe, Save (BUPUSA) Strategic Action Programme (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 to address jointly agreed priority environmental concerns in the BUPUSA basins. The SAP is endorsed at political (ministerial) level and, together with the related National Action Plans (NAPs) of the two Basin States, provides a basis for the implementation of SAP priority actions at national and basin level, and the integration of transboundary and basin concerns into national legislative, policy, and budget decision-making processes.

The SAP, like the two NAPs, is developed for a ten-year planning timespan, with targets set for that period. The SAP 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 basin. With regard to the priority issues, the analysis identifies the scale and distribution of the environmental and socioeconomic impacts at national and basin levels and, through an analysis of the root causes, identifies potential remedial and/or preventative actions.

The focus of the SAP is on transboundary and/or common environmental concerns, i.e., those that can only be addressed through collective action of both Basin States. The SAP is aligned with the NAPs of the two Basin States, Mozambique and Zimbabwe. The NAPs prioritise the environmental concerns identified by the TDA from a national perspective and identify suitable responses that can be implemented at national level only. Together, the SAP and the two NAPs provide a comprehensive programme to address the identified priority areas of environmental concerns at basin and national levels.

Mozambique and Zimbabwe Stakeholders review the final text for the BUPUSA TDA and launch the discussion on the SAP and NAPs. Photo credit: GEF- BUPUSA Project

1.2 Relationship with the Transboundary Diagnostic Analysis, National Action Plans, and national development plans

The SAP is based on an assessment of the priority environmental concerns as identified by the BUPUSA 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 work independently – the SAP reflects basin-wide priorities identified through the TDA/SAP development processes in the Basin States, while the NAPs provide the framework for the national-level implementation.

1.3 Geographic coverage

The BUPUSA SAP covers the entire geographical area of the BUPUSA basins in Mozambique and Zimbabwe.

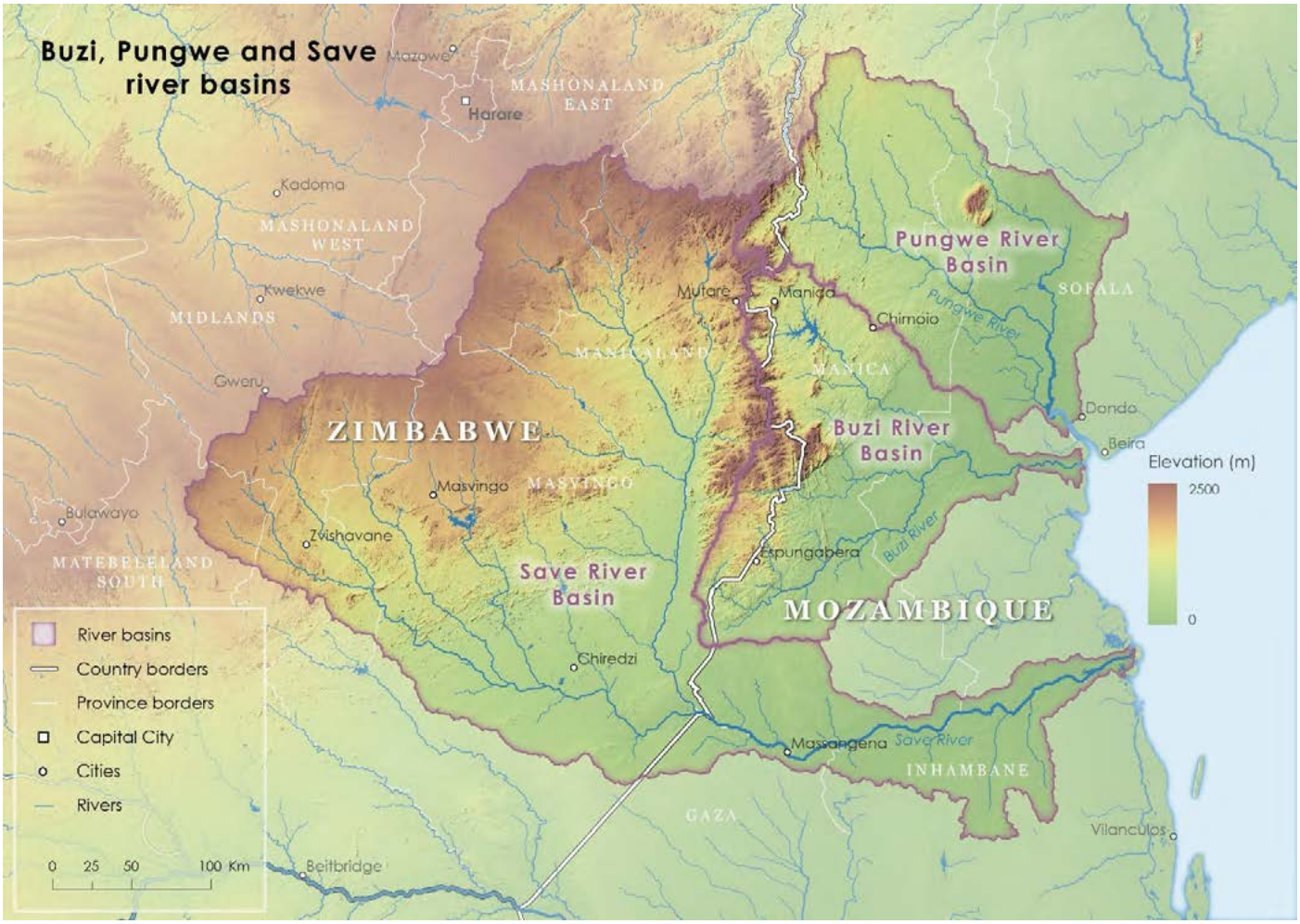


Figure 1: Spatial Map of the BUPUSA Basins. Source: GEF-BUPUSA Atlas 2024.

1.4 Strategic Action Programme structure

The SAP is structured around the five environmental priority areas of concern identified in the TDA and the two overarching areas of Transboundary Governance, and Socioeconomic Development and Poverty Reduction.

Through the SAP consultation process, stakeholders in the two Basin States collectively prioritised the five areas of concern in the three basins. In response to each priority area of concern, basin-wide targets were set to address these concerns over a ten-year time period. Interventions were then identified to meet the targets. In line with applicable international agreements and 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 SAP.

1.5 Strategic Action Programme development process

The SAP development process involved intersectoral dialogue to achieve integration of water resources management and, most importantly, endorsement of the SAP. While the NAPs and SAP work in conjunction, the SAP is an independent planning product, and its success depends on receiving full support of both state and non-state stakeholders.

In practice this means that the political and technical guidance for the SAP comes from the countries, through a SAP Working Group as well as a broader Basin-wide Stakeholder Forum. While it is part of the Basin-wide Stakeholder Forum, the SAP 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 SAP Working Group was primarily responsible for the development of the SAP and provided technical and political guidance for the formulation of the document.

The Basin-wide Stakeholder Forum consists of stakeholders representing a wide range of role-players, including both state and non-state participants. Three workshops of the Basin-wide Stakeholder Forum were held, in addition to regular meetings of the (smaller) SAP Working Group.

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

II

Governance framework

2.1 Transboundary governance framework

The transboundary water governance framework comprises several basin-level agreements developed against the background of the (Revised) Southern African Development Community (SADC) Protocol on Shared Watercourses as a regional framework agreement.

2.1.1 SOUTHERN AFRICAN DEVELOPMENT COMMUNITY PROTOCOL AS REGIONAL FRAMEWORK AGREEMENT

The (Revised) SADC Protocol on Shared Watercourses (hereafter SADC Protocol) is a regional framework agreement that contains a comprehensive set of substantive and procedural rules for the management of shared watercourses in the SADC region. Drafted in line with the legal principles of the 1997 United Nations Watercourses Convention, the SADC Protocol is centred on the three key principles of international water law, i.e., the principles of equitable and reasonable utilisation, the obligation to take all reasonable measures not to cause significant harm, and the duty to cooperate. The SADC Protocol also contains detailed provisions on aspects of environmental protection and ecosystem management. The purpose of the SADC Protocol is to establish a common legal framework that applies the same core set of international rules to the management of shared watercourses across the region. Within the framework set by the SADC Protocol, watercourse states are encouraged to enter into watercourse-specific agreements tailored to the characteristics of a particular watercourse (Article 6 [3]), while maintaining the key principles of the protocol.

2.1.2 BASIN AGREEMENTS

Mozambique and Zimbabwe signed the Joint Water Commission (JWC) Agreement in 2002. The purpose of the agreement is to promote joint planning, monitoring, development, and management of the water resources of the BUPUSA basins. Under the umbrella of the JWC the two countries have concluded a basin-specific agreement for each of the three BUPUSA basins, notably:

- the Agreement on Cooperation on the Development, Management, and Sustainable Utilisation of the Water Resources of the Pungwe Watercourse (2016);
- the Agreement on Cooperation on the Development, Management, and Sustainable Utilisation of the Water Resources of the Buzi Watercourse (2019); and
- the Agreement on Cooperation on the Development, Management, and Sustainable Utilisation of the Water Resources of the Save Watercourse (2023).

All three agreements follow a nearly identical structure, consisting of a set of substantive and procedural articles, complemented by annexes with technical details that form an integral part of the respective agreements. The only differences in the generic structure are that the Pungwe agreement does not contain articles on gender mainstreaming, climate change, and basin transfers, which are included in the two later agreements. The Buzi agreement does have an additional article on groundwater quantity and quality, which is not included as a separate article in the other two agreements. And finally, the Save agreement does not have an annex with a detailed flow regime and water allocation, which is a central component of the other two agreements.

The late Minister of Water for Zimbabwe, Hon. Perrance Shiri (sitting on the left) and former Minister of Water for Mozambique, Hon. João Machatine, signing the Buzi Water-Sharing Agreement in Mutare, Zimbabwe, in July 2019. Photo credit: BUPUSA Tri-basin Project

All three agreements are based on the three central pillars of international water law, i.e., equitable and reasonable utilisation, the duty to take all reasonable measures to prevent significant harm, and the duty to cooperate. The latter includes the requirement to notify other watercourse states of planned measures. In applying these key principles to the three basins, the agreements are well harmonised with the SADC Protocol (to which direct reference and referral is made in several articles of the agreements) and as such with the established transboundary water management principles and state practice in the SADC region.

In addition to the three core rules, the agreements contain detailed provisions on environmental protection, water quality, and drought and flood management, as well as procedural rules such as those on transboundary data and information exchange.

In an approach that is fairly uncommon for the SADC region (with the exception of the Incomati and Maputo Interim Agreement), Annex 2 of the respective Buzi and Pungwe agreements contains detailed volumetric water allocations between countries, as well as rules for the determination of environmental flows. The volumetric allocation follows an agreed order of priority for uses, with domestic, livestock, and industrial uses considered to be 'priority uses'. The water allocation between countries follows a detailed breakdown, using a matrix of water-use type and sub-catchment. Article 1 (1) of Annex 2 refers to the criteria of Article 8 (2) of the main agreement, which contains the factors for determining equitable utilisation.

Translating the generic factors for determining equitable utilisation into a robust regime that allocates water volumes to specific uses in defined catchments is one of the key challenges of applying international water law in practice, and Mozambique and Zimbabwe collectively have made great strides in this regard. Equitable and reasonable utilisation is widely understood to be a flexible regime that requires adjustments over time, based on the factors, i.e., dependency criteria, used to determine equitable utilisation. Accordingly, the three agreements, and with them the allocation regime, are valid for a period of ten years initially. After that, the agreement will be automatically renewed for a similar period, unless either party gives written notice of the intention to terminate. Amendments to the agreements are possible at any time by mutual consent and through the exchange of notes through diplomatic channels. In addition to such amendments, the possibility of a revision and update of the agreements is anchored in the amendment provision of each of the agreements.

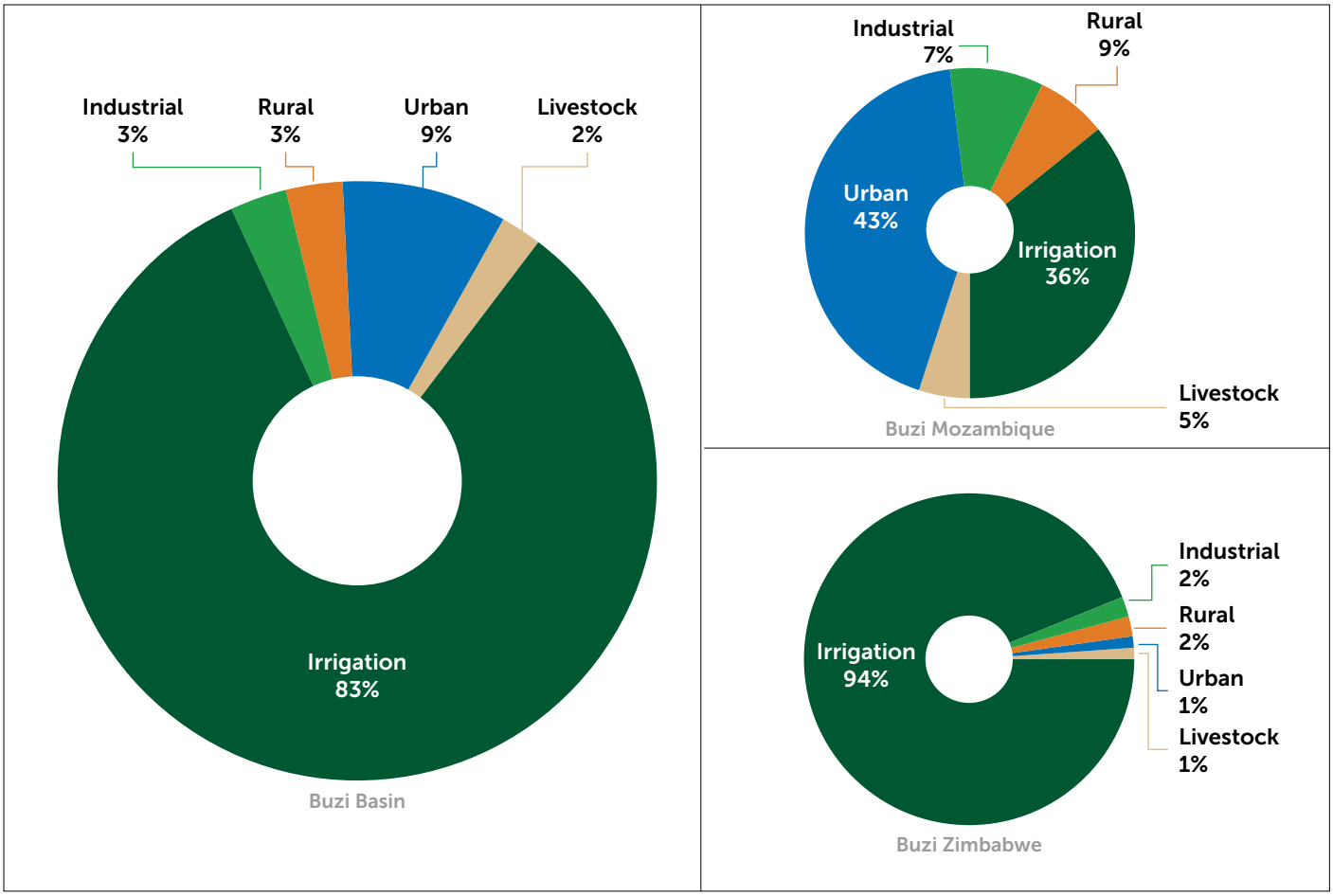


Figure 2: Buzi River Basin Water Uses. Source: GEF-BUPUSA Transboundary Diagnostic Analysis.

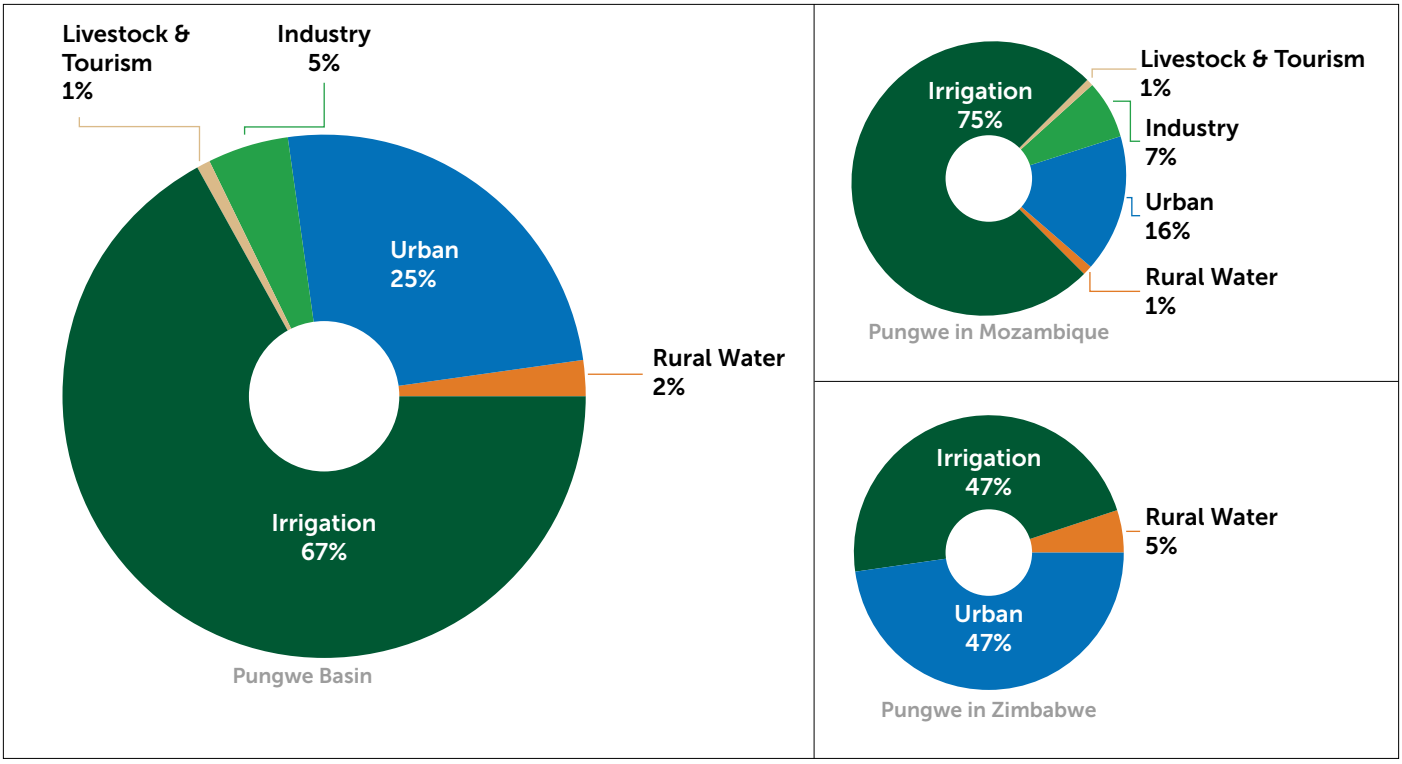


Figure 3: Pungwe River Basin Water Uses. Source: GEF-BUPUSA Transboundary Diagnostic Analysis.

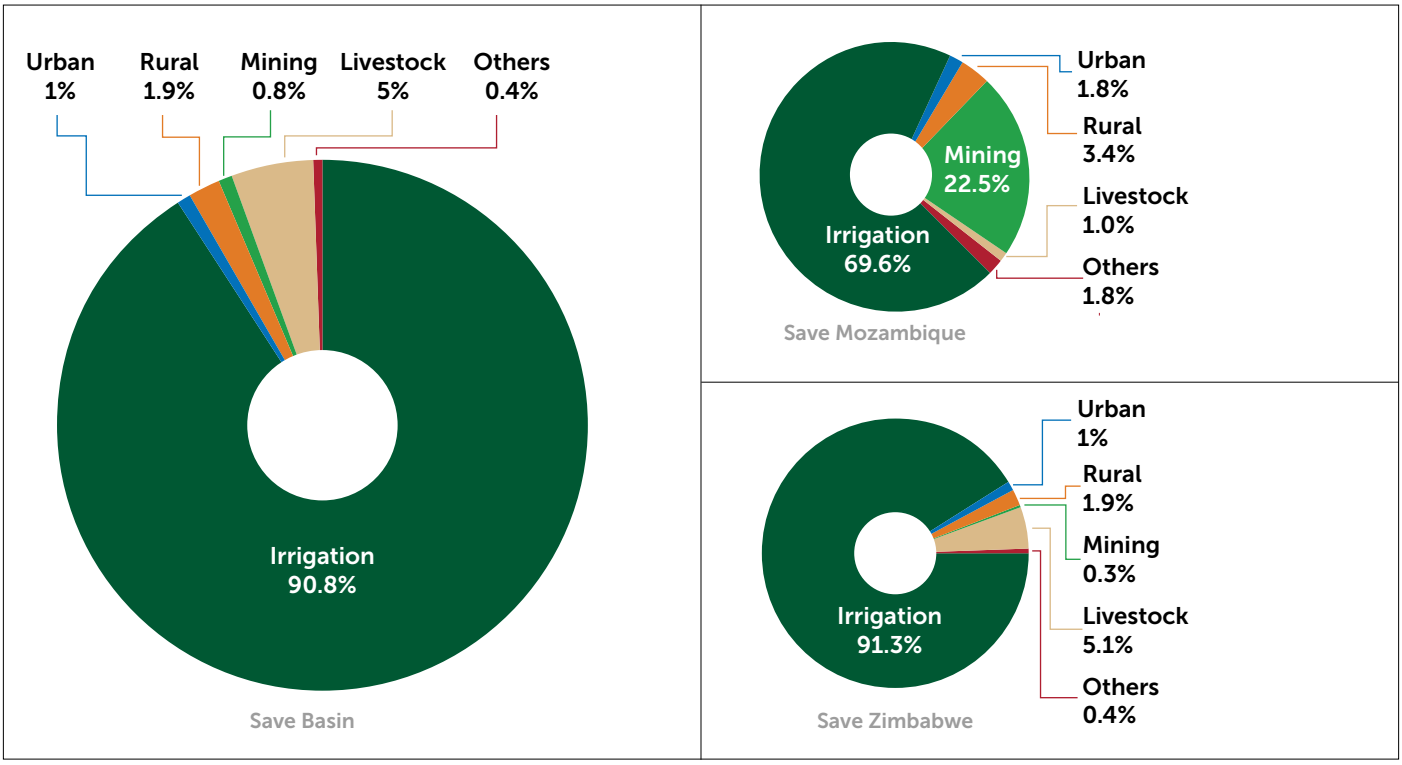


Figure 4: Save River Basin Water Uses. Source: GEF-BUPUSA Transboundary Diagnostic Analysis.

The Save agreement differs from the Buzi and Pungwe agreements with regard to the approach to water allocation. The Save agreement contains no annex with a water allocation regime. Instead, reference is made to a detailed study that needs to be conducted and will form the basis for a future allocation regime. The annexes to all three agreements also contain lists of (infrastructure development) measures planned by each country. It is important to notice in this regard that such list of planned measures in an agreement is good practice in terms of transboundary information exchange but does not legally constitute a preliminary or full technical notification of such planned measures in accordance with the relevant provisions on prior notification in the basin agreements and SADC Protocol.

Finally, all three agreements contain annexes with details concerning water quality monitoring and the exchange of relevant data and information.

2.1.3 INSTITUTIONAL ARRANGEMENTS AND SUPPLEMENTARY RULES

On the operational level the rules in the basin agreements on basin monitoring and the exchange of the resulting data and information are complemented by the 'Rules and Procedures between the Republic of Zimbabwe and the Republic of Mozambique on the Sharing of Data and Information Related to the Development and Management of the Buzi, Pungwe and Save Watercourses' of August 2022. These Procedures have been adopted by the JWC and, as the title suggests, apply equally to all three basins. The Procedures comprise two inter-related parts, with Part I being the general legal rules and principles on, e.g., data ownership, data security, institutional responsibilities, or cost sharing. Part II contains the technical specifications for data and information sharing, e.g., data exchange formats, channels, and frequencies. Part II is designed for annual review and update at technical level, whereas Part I is meant to be more permanent.

It is noteworthy that the Rules and Procedures for data and information exchange follow the exact same format as has been applied in the Zambezi and Cubango-Okavango Basin (with the technical specifications being the only difference), thereby contributing to regional harmonisation of state practice.

Interestingly, while developed under the auspices of and adopted by the JWC, all references in the Rules and Procedures to institutional responsibilities are to the respective organs of the Buzi, Pungwe, and Save Watercourses Commission (BUPUSACOM). While BUPUSACOM did not yet formally exist at the time of adoption by the JWC of the Data Sharing Rules and Procedures, the preparation for its establishment was well under way. The agreement to establish BUPUSACOM was signed on 17 May 2023.

The Ministers of Water for Mozambique and Zimbabwe signing the Save Water Sharing Agreement, the BUPUSA Hosting Agreement, and the BUPUSA Establishment Agreement in Harare, Zimbabwe on 17 May 2023. The Presidents of Mozambique and Zimbabwe witnessed the signing of the Agreements. Photo credit: Ministry of Information, Publicity and Broadcasting Services, Zimbabwe

BUPUSACOM was established as a designated commission for the three basins. At the same time, the JWC, which concerns itself with 'water resources of common interest', will continue to exist, as its scope is much broader than only the BUPUSA basins. The fact that the JWC adopted data-sharing rules and procedures that refer, institutionally, to BUPUSACOM leaves no doubt that BUPUSACOM is meant to be the primary institution for all matters concerning the transboundary management of the three basins. It is understood by the two countries that the JWC and BUPUSACOM agreements in their current form leave potential for overlap and that a revision of the JWC agreement will therefore need to eventually happen. In practice, the responsibilities of the JWC regarding the BUPUSA basins will gradually be transferred to BUPUSACOM as the latter gets physically established and operationalised. To facilitate the operationalisation process, a hosting agreement was concluded on 17 May 2023, the same day the BUPUSACOM agreement was concluded.

The launch of the BUPUSA Commission was officiated by the deputy ministers of water for Mozambique and Zimbabwe and attended by representatives from the Southern African Development Community (SADC) Secretariat River Basin Organizations, International Cooperating Partners and other organizations in the region's water sector. Photo Credit: GEF - BUPUSA Project

The BUPUSACOM agreement reiterates (many of) the same principles already established in the three basin agreements, without including some of the more specific legal rules included in the latter, and without the technical annexes included in the basin agreements.

The BUPUSACOM agreement establishes the Commission with an advisory mandate, effectively making it the primary platform for inter-state engagement related to the transboundary management of the three basins. In line with common practice for Watercourse Commissions in the SADC region, the Commission comprises a tiered institutional structure, which is made up of a Council of Ministers as the supreme decision-making body of the Commission, a Technical Committee, and a standing Secretariat.

2.1.4 CHALLENGES RELATED TO TRANSBOUNDARY COOPERATION

Notwithstanding the (relatively) recent signing of the basin agreements and the legal establishment of the BUPUSACOM, transboundary management in the three BUPUSA basins faces a number of challenges. The limited financial resources available to build up the capacity of the newly established BUPUSACOM Secretariat and counterpart institutional structures at national level are one of the key challenges.

In terms of joint planning and management of the basins' water resources, a prevalent challenge is the absence of cooperatively developed basin-wide management plans. A comprehensive, basin-wide plan is crucial for implementing the basin agreements and fostering a shared vision for the responsible management of transboundary water resources.

Joint planning is hampered by the relative scarcity of monitoring data essential for this planning. Insufficient and disparate data hinder the development of a comprehensive understanding of the transboundary water systems. This data deficit obstructs informed decision-making, making it difficult for nations to collectively plan and manage shared water resources. Bridging this information gap necessitates a concerted effort to enhance monitoring infrastructure and practically implement the data-sharing mechanisms that have been agreed on.

Furthermore, inadequate integration between transboundary and national legal and planning frameworks poses a substantial obstacle. National policies and legal structures often operate in isolation, leading to conflicting approaches and hindering the seamless coordination needed for effective transboundary water management. Establishing a harmonious alignment between national and transboundary frameworks is essential to facilitate streamlined decision-making processes between national and transboundary levels.

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

2.2.1 MOZAMBIQUE

The water sector in Mozambique is governed primarily by the Water Law of 1991 (Law No. 16/91 of 3 August). 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 Law is complemented by the Water Policy, originally of 1995, and subsequently revised in 2007 and further updated in 2015. The Policy assigns water resources management functions to basin and provincial level organisational structures and strengthens the concept of Integrated Water Resources Management (IWRM).

Mozambique also adopted a National Strategy for Water Resources Management, which 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 decision-making, planning, monitoring, and management of the water supply systems 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. This instrument determined that the State is responsible for the water sector management through the Ministry governing the sector and assigned to local governments the responsibility of establishing the priorities concerning the development of strategic projects regarding water use. The same document assigned to the regional water administrations (ARAs) the responsibility for water use licensing.

The regulation of raw water quality standards and dischargers of liquid and solid effluents defines the water quality standards for raw water and effluent discharges, setting the maximum admissible levels for the concentration of pollutants in surface and groundwater resources.

The Drinking Water Quality 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. It promotes the rational use and management of the environmental components, reinforcing the role of water in the sustainable development of the country.
The Environment Policy of 1995 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 Regulation on Environmental Quality and Effluents Emissions establish the parameters of water quality assessment, which vary according to the category of water use.

The Regulation on the Environmental Impact Assessment procedure through Decree No. 45/2004 specify the conditions for carrying out environmental impact assessments in public or private activities with potential negative influence on the environment.

The Land 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 Land Act and its Regulations make provision for the protection and conservation of water resources

through the creation of partial protection zones where in principle no infrastructure should be built.

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

The Mining Law sets out the legal frameworks for exploration of mineral resources, the necessary administrative procedures for the concession of licences and respective duration, and the investors' regies applicable for each mining title.

In 2017, a new Master Plan for Disaster Risk Reduction was approved by the Council of Ministers, covering the period 2017-2030). Also in the field of climate change and disaster reduction is the National Climate Change Adaptation and Mitigation Strategy, which 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 the green economy through their integration into the sectoral planning.

In 2019, the Government to Mozambique approved the National Water Resources Management Plan, which highlights the importance of developing structural and non-structural measures for flood management and mitigation.

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;
- 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); and
- Decree 10/2021 of 24 August, which approves the Disaster Management Law.

2.2.2 ZIMBABWE

Zimbabwe's macroeconomic development is guided by the National Development Strategy 1 (NDS 1). The current five-year implementation period (2021-2025) is geared at meeting the objectives of the country's Vision 2030.

One of the key objectives of the NDS 1 is 'ensuring sustainable environmental protection and resilience', which is implemented through the three strategic priorities of:

- environmental protection;
- climate resilience and natural resource management; and
- infrastructure and utilities.

The primary legislation dealing with integrated water resources and environmental management are the Water Act, the Zimbabwe National Water Authority (ZINWA) Act and the Environmental Management Agency (EMA) Act, as summarised below:

The Water Act of 1998 governs the use and management of water resources in Zimbabwe. The repealing of the Water Act of 1976 brought in the Water Act of 1998, which is entrenched in an integrated and stakeholder-driven water resources management framework. The following were the main weaknesses of the Water Act of 1976, which were repealed by the current Act:

- The issue of all water rights was centralised at the Water Court in Harare and the water right was issued in perpetuity on a first-come first-served basis. In the event of a water shortage, the process of reallocation was very long and complex;
- A water right would not be revised, even if the right holder was not exercising his or her water rights;
- The water rights could only be revised if the holder volunteered to do so;
- The process of acquiring a water right was very long;
- Once granted, there was no requirement to pay for the possession of the water right or to contribute towards general water service provision;
- The Act was silent on water quality and factors relating to the environment; and
- There was little consideration given to groundwater supplies.

The Water Act of 1998 is founded on economic efficiency, environmental sustainability, and equity of use of water resources within Zimbabwe. The Act established stakeholder-driven institutions that have more say on water allocation and general water management on a

day-to-day basis. Thus, water management has been decentralised to stakeholder-managed Catchment Councils (CCs) and Sub-Catchment Councils (SCCs). CCs and SCCs are therefore key institutions tasked with the day-to-day management of water resources, with SCCs being the lowest-tier water management institutions. The Minister of Lands, Agriculture, Fisheries, Water and Rural Development, through the Department of Water Resource Development and Utilisation, provides oversight of the operations of CCs and SCCs.

The Zimbabwe National Water Authority (ZINWA) Act was promulgated in 2000, giving birth to ZINWA. ZINWA was formed with the primary role of taking over the commercial functions of the Department of Water Development as well as water resources management. Furthermore, ZINWA is designated to assist local authorities in the provision of potable water. The Minister of Lands, Agriculture, Fisheries, Water and Rural Development provides oversight to the operations of ZINWA and delegates tasks to the National Water Authority.

The Environmental Management Act was promulgated in 2000. It provides for:

- the sustainable management of natural resources and protection of the environment;
- the prevention of pollution and environmental degradation;
- the preparation of a National Environmental Plan and other plans for the management and protection of the environment;
- the establishment of an Environment Fund; and
- the establishment of the EMA. The EMA is a body corporate capable of suing and being sued in its own name.

The Act repealed various Acts, including: the Natural Resources Act (Chapter 20:13), the Atmospheric Pollution Prevention Act (Chapter 20:03), the Hazardous Substances and Articles Act (Chapter 15:05), and the Noxious Weeds Act (Chapter 19:07).

In Zimbabwe, the land tenure system is divided into four categories, namely the freehold system, the state land system, the communal land system, and the leasehold (resettlement) tenure system.

- The freehold tenure is characterised by individual ownership of land by virtue of a title deed issued under the Deeds Registry Act. The registered landowner has exclusive property rights and full control and responsibility over the land, and everything attached to it. This system is prevalent in the commercial farming sector, which consists of large-scale and small-scale commercial farmers. Freehold tenure provides land ownership with incentives to conserve and improve the natural resources base.
- The communal land tenure system is governed by the Communal Land Act Chapter 2004 of 2021 and is applicable to 42% of Zimbabwe's land area, where approximately 66% of the country's population resides. According to the Communal Land Act, all communal land is vested in the State President, who has powers to permit its occupation and utilisation in accordance with the Act. Communal area inhabitants thus have usufructuary rights over communal land.
- State land (approximately 15% of the country) is set aside as gazetted/protected forests and national parks, mainly to promote the conservation and sustainable use of Zimbabwe's resource base.
- The leasehold/resettlement system covers about 10% of the country and is a product of the post-independence period targeted at relieving population pressure in communal areas. Under this system, people have no title deeds but instead have lease agreements. This system is a disincentive to long-term investment in land, agriculture, and other key natural resources.

Other Acts that are relevance to water management include the Urban Councils Act (Chapter 29:15), 1996 edition, the Rural District Councils Act (Chapter 29:13), 1996 edition, and the Mines and Minerals Act (Chapter 21:05), 1996 edition. The Public Health Act and Disaster Risk Management Bill, 2011. The various Acts that deal with water in Zimbabwe are not synchronised. While the Urban Councils Act allocates responsibilities to Urban Councils, it does not specify duties and responsibilities of local authorities to ensure availability, access, and affordability of services. The EMA Act addresses pollution in general but is inadequate to ensure correction and prevention. Penalties and fines are not linked to better performance and corrective action. The Water Act is not adequately linked to the ZINWA Act, Urban Councils Act, and Public Health Act.

2.3 National institutional framework for water and natural resources management

2.3.1 MOZAMBIQUE

The Ministry of Public Works, Housing and Water Resources 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 management 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, some of the key responsibilities of the DNAAS are to propose and ensure the implementation of policies, strategies, rules, regulations, and technical specifications for water supply and sanitation; promoting investments to the construction, maintenance, and expansion of infrastructure; the development of drainage standards in urban and rural settlements; the establishment and operation of national information systems on water and sanitation; and the provision of technical and methodological support to local authorities.

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 water resources of the country's river basins. In this context the directorate is also responsible for the promotion of investments needed to ensure the sustainable exploitation of water resources, including storage, water transport, and water resources protection.

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 Energy and Mineral Resources (MIREME), the Ministry of State Administration and Public Services, the Ministry of Land and Environment, the Ministry of Agriculture and Rural Development, and the Ministry of Health.

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 raw water quality monitoring and the available water resources in river basins.

The responsibilities assigned to the ARAs further encompass the planning and assurance of the availability and balanced distribution of water resources in the region; control of the use and operation of water resources; environmental protection through effluents discharge control; licensing and concession of use and operation of water resources; and implementation of water use charges or the cost recovery for the use of hydraulic infrastructure. The areas of jurisdiction of each of the three ARAs (North, Centre, and South) are defined according to the borders and river basins of the country.

The territorial responsibility of the three ARAs, IPs is as follows:

ARA South, IP, which includes all the basins south of the Save, and the Save river basin itself;
ARA Centre, IP, which covers all the basins between the Save and Zambezi basins, including the Pungwe and Buzi rivers; and
ARA North, which covers the basins between the Zambezi basin and Rovuma river basin itself.

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 the Provincial Directorate of Public Works, Housing and Water Resources, which owns the systems for rural water supply and sanitation.

The Ministry of Health 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 Ministry of Land and Environment 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 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, while the Ministry of Agriculture and Rural Development is responsible for the water supply for agriculture irrigation.

The Basin Committees ae 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 BUPUSA 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.

2.3.2 ZIMBABWE

The Ministry of Lands, Agriculture, Fisheries, Water and Rural Development is the primary institution responsible for water matters in Zimbabwe. Within the Ministry, the Department of Water Resources Development and Utilisation is responsible for oversight of the water sector in Zimbabwe. Its main functions are to develop policies to guide the orderly and integrated planning of the optimum development, utilisation, and protection of the country's water resources in the national interest; to ensure the availability of water to all citizens for primary purposes; to meet the needs of aquatic and associated ecosystems, particularly when there are competing demands for water; and to ensure the equitable and efficient allocation of the available water resources in the national interest for the development of the rural, urban, industrial, mining, and agricultural sectors.

This overall planning, development, and water resources management responsibility is supported by ZINWA, CCs and SCCs.

Coordination in the water sector is undertaken by the National Action Committee on Water Supply and Sanitation, chaired by the Ministry and supported by a Department of Water, Sanitation, Hygiene and Pollution coordination. The committee is the apex inter-ministerial body that was formed to coordinate all aspects of water development and management in Zimbabwe. It comprises three sub-committees: the Water Resources Management, Urban, and Rural Sub-committees, responsible for sub-sector coordination.

The Ministry of Health and Child Care is a key player in the rural Water, Sanitation and Hygiene (WASH) sub-sector responsible for water quality monitoring, and promoting safe water supply and household sanitation. The Ministry of Health and Child Care has the lead role in promoting health and hygiene education, and encouraging healthy sanitation and hygiene. The Ministry of Transport and Infrastructure Development, through the Department of Infrastructure Development, hosts a unit to appraise and manage infrastructure projects funded from the Rural Capital Development Fund. A specific component of this fund is dedicated to financing rural WASH activities. The MTCID chairs the rural National Action Committee sub-committee and is responsible for sector coordination. The Rural Infrastructure Development Agency (RIDA) maintains a small unit for back-up borehole drilling, deep well sinking, and pump repair and rehabilitation in each Rural District Council (RDC) area. RIDA provides technical guidance and expertise to RDCs in planning and supervising rural WASH development, in addition to advising District Water and Sanitation Committees on borehole drilling and pump maintenance.

The Ministry of Environment, Climate and Wildlife, through the EMA, is responsible for environmental issues as a regulatory institution on all issues, including water and water issues such as water pollution control, water source protection, and water allocation for the environment. It is also responsible for coordination on climate change.

The Ministry of Energy and Power Development, the Ministry of Mines and Mining Technology, and the Ministry of Local Government, Public Works and National Housing, through Urban and Rural Councils, are

responsible for water use and therefore management at consumer level. They represent different constituencies of water users (Zimbabwe National Water Policy, 2012). The Ministry of Finance and Investment Promotion, the Ministry of Energy and Power Development, development partners, and the private sector are major players with regard to the financing of the water supply system.

The Ministry of Women Affairs, Community, Small and Medium Enterprises, the Confederation of Zimbabwe Industries, Urban Residence Associations, and ordinary members of society are also important interested parties in water issues, as they are impacted directly or indirectly.

ZINWA is a statutory body established in terms of the ZINWA Act 20:25. Its main responsibility is to manage the country's water resources in the seven major catchments. Its role is also to advise the Minister on the formulation of national policies and standards on water resources planning, management, development, hydrology and hydrogeology, dam safety, borehole drilling, and water pricing. Its role is also to ensure that CCs discharge their functions in accordance with the Water Act. It is further mandated to operate and maintain any waterworks owned by the State, to dispose of wastewater, to construct boreholes, and to provide design and construction services. In the transboundary context, it promotes such mechanisms for the cooperative management of international water resources as the Minister may determine. ZINWA was established as a self-financing institution which generates revenue to finance its operations through the provision of raw water services, sale of agreement water, groundwater investigation, and service provision. In terms of the ZINWA Act, ZINWA is also mandated to provide potable water supply services to local authorities and government institutions that are not yet able to take on this responsibility themselves. Therefore, ZINWA has two distinct functions, the first being that of water resources development and management, and the second being a limited potable water supply function.

The CCs are statutory bodies established in terms of the Water Act, Chapter 20:24, to promote a stakeholder-driven water resources management. Their main roles include preparation of catchment management plans in consultation with the stakeholders, granting permits for water use, regulating and supervising water use, supervising the performance of SCCs as well as resolving conflicts within their areas of jurisdiction.

The SCCs are statutory bodies and grassroots-level water resources management institutions that are a product of efforts by Zimbabwe to fully implement IWRM throughout the entire water resources management framework, thereby promoting a participatory and decentralised approach in water management and utilisation. The key functions of the SCCs include regulating and supervising the implementation of water permits, including groundwater use; monitoring water flows and use in accordance with allocations by the CC; providing representatives for the CCs; promoting catchment protection; assisting in data collection; and participating in catchment planning. They also collect rates and fees for all permits issued in their jurisdiction.

Pungwe River in Nyanga, Zimbabwe. Photo Credit : GEF-BUPUSA Project

III

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.

3.1 Underlying drivers

3.1.1 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 basin. 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 river and its estuary. 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 harvesting of natural resources and for clearing of new farmland. All these lead to increased land degradation.

Fishing is a common source of livelihoods for both subsistence and income generation. Fishermen use canoes for transport when fishing. Photo Credit:Gwyn Letley – Anchor Environmental

3.1.2 LAND USE CHANGE

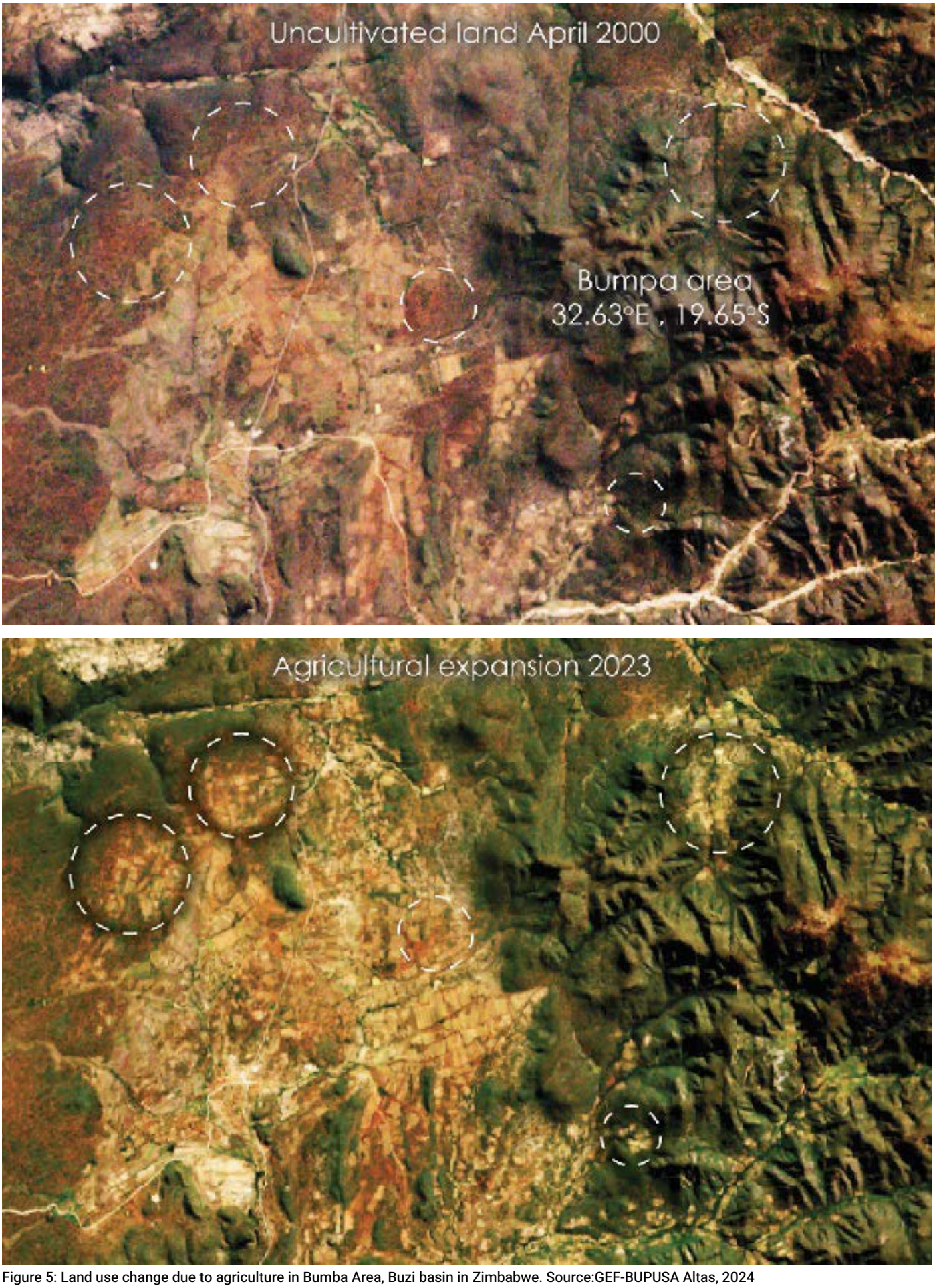


Figure 5: Land use change due to agriculture in Bumba Area, Buzi basin in Zimbabwe. Source:GEF-BUPUSA Altas, 2024

Land use change is a driving force for changes in sediment dynamics, water quality and abundance, and distribution of biota, and through deforestation it 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 past 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 may be a more difficult challenge to manage.

3.1.3 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. 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 basin. 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 cut for household use, baskets, and matting. To some extent, such natural resources are sustainable, regrowing 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 changed so much 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. The poorest elements of resident societies in the three basins have tended to rely on direct use of natural resources and to depend on the fact that access to these resources provides them with a safety net in times of adversity.

A homestead with pole and dagga houses along the Pungwe River in Mozambique, which is common in rural Mozambique. Photo credit: Gwyn Letley, Anchor Environmental

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. Both basin countries have national poverty reduction strategies aimed at improving the welfare and living conditions of their populations through increased economic growth.

3.1.4 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 past 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 population at very high risk of groundwater drought could rise from 32% to 86% without the implementation of measures 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, among 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. Investing in water harvesting, storage, and drainage infrastructure will reduce the number of people affected by flooding and drought. Investment in nature-based solutions is also needed to build climate resilience.

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.

Residents of Buzi District, in Sofala province, Mozambique, wait on rooftops for rescue teams after Cyclone Idai made landfall in March 2019. Excessive flooding is a common occurrence in the BUPUSA Basins. Photo Credit: Instituto Nacional de Gestão de Calamidades, (INGC)

3.1.5 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 still 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 tri-basin commission BUPUSACOM.

3.2 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 ecosystem health and the functioning of aquatic ecosystems in the basin. 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.

While all of the above problems occur in all three BUPUSA basins, their level of priority in comparison to the other problems differs between the three basins. Likewise, the degree of severity of each problem varies between the basins. Table 1 shows a ranking of issues in order of priority for the respective basins and Table 2 indicates the level of severity of the problem for each basin.

Table 1: Priority ranking of issues

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

1 = highest priority; 5 = lowest priority

Table 2: Level of severity of priority issues

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

3.2.1 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 and groundwater supplies by 2035. This is slightly above the water allocation agreed 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 and groundwater supplies by 2035, which, as with the Buzi, is slightly above the water allocation agreed in the water sharing agreement for that point in time.

High siltation levels in the Save River at Birchenough Bridge, Zimbabwe, due to poor upstream catchment management or land use practices. This has resulted in a reduction in water available for utilisation. Photo credit: GEF-BUPUSA Project.

The water use in the Save Basin as a percentage of available surface and groundwater resources was estimated at 117% of mean annual runoff in Zimbabwe, 28% for Mozambique and 102% for the whole basin. By 2035 the water demand will be about 151% of mean annual runoff 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.

Communal borehole in Chiredzi, Zimbabwe providing water for more than 200 households from three villages. Photo credit: GEF- BUPUSA Project

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 partially related to climate change and are otherwise attributable to water use patterns across the key sectors of agriculture, mining, urban and domestic supply, energy, and 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 the 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.

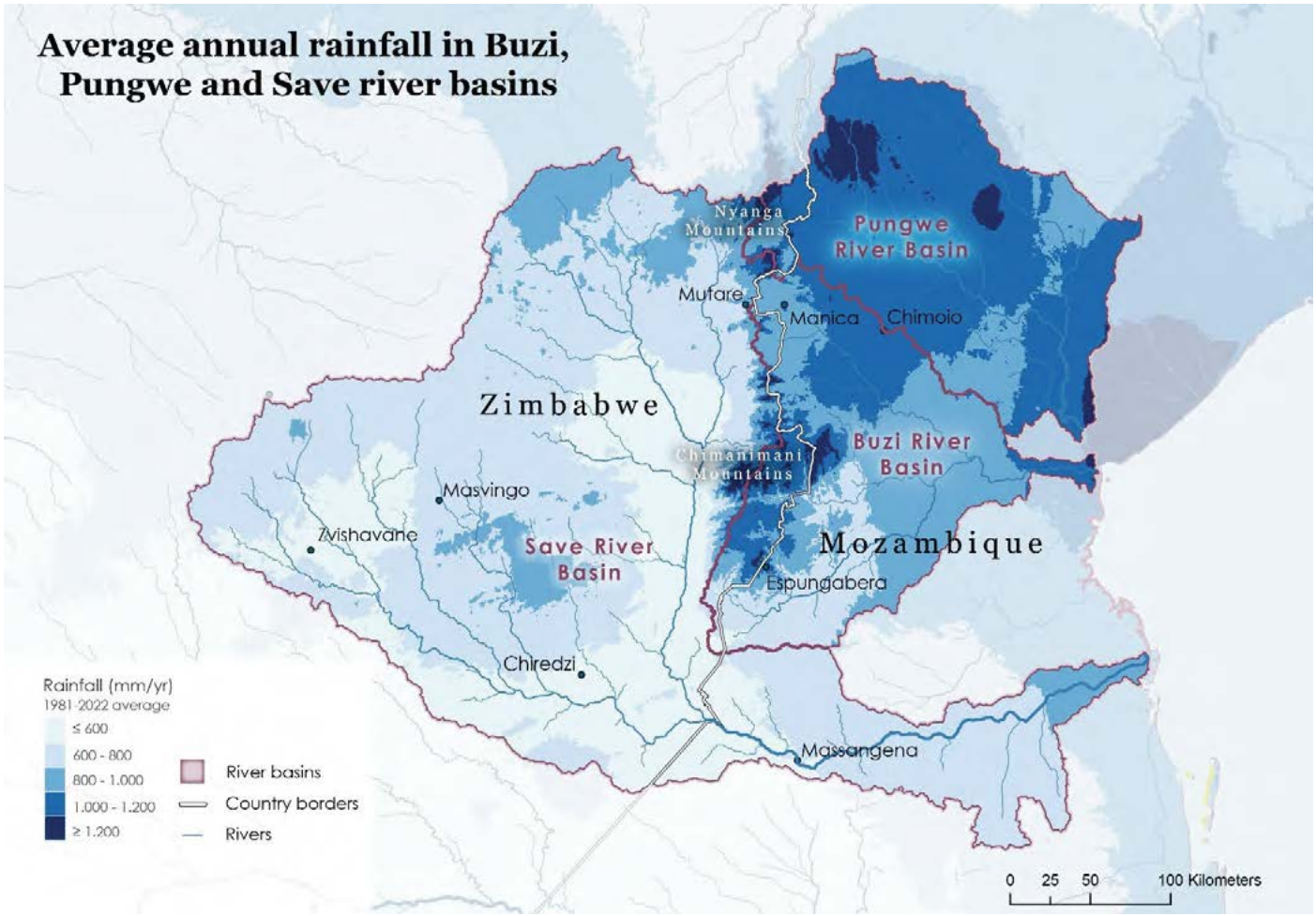


Figure 6: Average annual rainfall in the Buzi, Pungwe, and save river basins. Source:GEF-BUPUSA Atlas 2024.

3.2.2 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, which is 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.

Makeshift tailing dams made by artisinal miners in Penhalonga, Mozambique, in an attempt to address the compromising quality of water due to unsustainable mining practices in the tri-basin. Photo credit: Davison Saruchera

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

Table 3: Water quality degradation hot spot areas

Buzi	Pungwe	Save
Rusitu River	Nyamukwarara River	Mutare River
Nyahode River		Odzi River
Haroni River		Save River
Nyabamba River		Along Runde River
		Shurugwi
		Mberengwa
		Zvishavane

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 is in fact ranked as having 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 basin.

Charcoal Sales along the Pungwe Basin. Photo Credit:Gwyn Letley – Anchor Environmental.

Poor land use practices have increased the rates of wetland loss and soil erosion, resulting in siltation of rivers. Deforestation caused by uncontrolled bushfires, inadequate cultivation practices in sloping land, the destruction of forest for the harvesting of firewood and charcoal, and for building materials for the manufacture of household utensils have all caused soils to be exposed to erosive effects. This often results in the excessive accumulation of sediments in river courses, thereby deteriorating the quality of water in river courses and reducing soils' capacity to retain and infiltrate water into aquifers. Furthermore, considering a possible increase in the number of people living in the catchments and also 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.

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 the 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.

3.2.3 LAND DEGRADATION

Poor land management practices have altered 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 for 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 basins 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 is 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 basin. 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 common and widespread in the three basins, but certain hot spot areas are particularly affected, as shown in the table below.

Table 4: Land degradation hot spots

Buzi	Pungwe	Save
Rusitu	Nyamukwarara River	Penhalonga
Machongwe		Odzi
Kopa		Shurugwi
		Buhera District
		Gutu
		Masvingo

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 live-lihood options. At the policy level, interventions related to agricultural practices need to address the issues of inequitable land tenure.

3.2.4 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.

Land degradation in Nyanyadzi on the Odzi sub catchment along the Save River in Zimbabwe. Photo credit: Edimus Musona

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, 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 assuring 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.

Flow regime changes due to water diversion for artisinal gold mining coupled with abstraction for agriculture on Ruvue river tributary of the Buzi River in Mozambique. Photo credit Davison Saruchera.

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 assure supply at times when and places where there would otherwise be a shortfall. While 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.

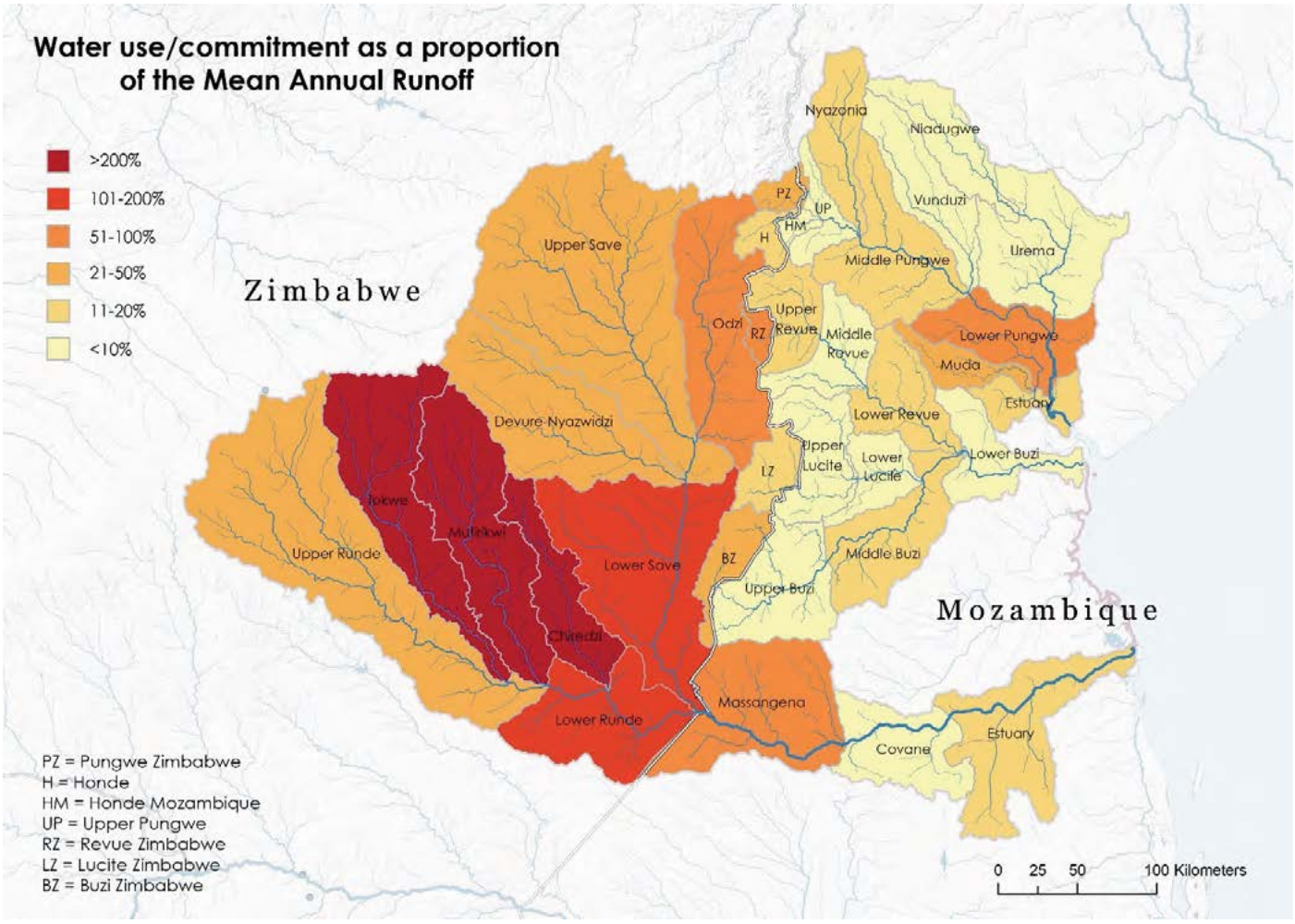


Figure 7: Amount of water commitment versus amount of water generated in the three catchments. More water is used in the Save basin compared to the Buzi, and Pungwe basins Source: GEF-BUPUSA Atlas 2024

3.2.5 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) and 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 1,400mm/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 because 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.

Dry river bed along the Save River Basin in Chiredzi, Zimbabwe.

Climate change is expected to amplify already existing water resources challenges in the tri- basin. Increased temperatures decreased and late-onset rainfall, and decreased total flows can be expected in the basins under the most probable emission scenarios. This points towards a drier future. However, this 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 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 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, especially in the:

- Buzi Basin: Bumba Buzi Village, Dombe, Estaquinha, Grudja, Guara-guara, Chipinge, and Chimanimani;
- Pungwe Basin: Tica , Metuchira, and the Beira floodplains; and
- Save Basin: Chiredzi, Nyanyadzi, Birchenough, Middle Sabi, Mwenezi District around Neshuro, Mambone and Machanga villages.

The drought risk is considered to be especially severe in the Buhera, Chivi, Bikita, Marange, Checheche in Chipinge, Gutu, and Zaka areas of the Save Basin in Zimbabwe . With subsistence agriculture being rainfed and highly dependent on natural resources that may be decreased or degraded because of climate change, coupled with high poverty levels and low education/literacy, people's options for making agricultural activities more climate-resilient are limited.

A man searches through the rubble after Cyclone Idai, in March 2019, in Beira, Mozambique. Many families were left homeless after their houses were destroyed by the cyclone. Photo credit: Denis Onyodi/The Associated Press

IV

Interventions and investments addressing the priority areas of concern

Table 5: Cross-cutting interventions

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Cross-cutting interventions				
Transboundary governance				
Objective: The regional governance frameworks for transboundary basin management are strengthened and the source-to-sea management approach is established in basin management				
Target 1: Institutional, technical, and operational capacity of BUPUSACOM strengthened	Institutional, technical, and operational capacity needs assessment carried out and short-, mid-, and long-term capacity development plan adopted	**SAP PCN 1:** Strengthening basin-wide source-to-sea management capacity in the BUPUSA basins	• Global Environment Facility (GEF) BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins • United Nations Educational, Scientific and Cultural Organization (UNESCO) Project: "Towards a community focused flood Early Warning System for the Buzi-Pungwe and Save (BuPuSa) Transboundary River Basins • United Nations Development Programme and Green Climate Fund (UNDP-GCF) automatic gauging stations • Building Climate Resilience of Livelihoods in Southern Zimbabwe and Mozambique • Capacity needs assessment under the GEF BUPUSA Project • Blue Deal-Land use mapping in Buzi and Water quality in Buzi and Pungwe	• Establishment Agreement • BUPUSACOM Hosting Agreement • Buzi Watercourse Agreement • Pungwe Watercourse Agreement • Save Watercourse Agreement • BUPUSA Data Sharing Procedures • Revised SADC Protocol on Shared Watercourses
	Institutional, technical, and operational capacity of BUPUSACOM enhanced through implementation of priority actions identified in capacity development plan (including staff recruitment)			
	Comprehensive organisational procedures for BUPUSACOM developed (e.g., financial management, HR management, procurement, etc.)			
	Gendered approach integrated into programming, and gender-responsive monitoring and evaluation system developed and implemented for tracking programmes and projects			
Target 2: Effective mechanisms for transboundary data and information exchange between BUPUSACOM Member States in place	Basin-wide water/environmental monitoring system established and fully operational			
	Needs for groundwater monitoring identified, monitoring objectives set, and basin-wide groundwater monitoring network designed and integrated with Water Information System (WIS)			
	WIS and Decision Support System operational within the BUPUSACOM Secretariat			
	Procedures for data and information exchange between BUPUSACOM Member States effectively applied, including groundwater data			

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Cross-cutting interventions				
Transboundary governance				
Objective: The regional governance frameworks for transboundary basin management are strengthened and the source-to-sea management approach is established in basin management				
Target 3: Transboundary management instruments adopted and applied	Transboundary IWRM/water resources development plan developed	**SAP PCN 1**: Strengthening basin-wide source-to-sea management capacity in the BUPUSA basins	• Global Environment Facility (GEF) BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins • United Nations Educational, Scientific and Cultural Organization (UNESCO) Project: "Towards a community focused flood Early Warning System for the Buzi-Pungwe and Save (BuPuSa) Transboundary River Basins • United Nations Development Programme and Green Climate Fund (UNDP-GCF) automatic gauging stations • Building Climate Resilience of Livelihoods in Southern Zimbabwe and Mozambique • Capacity needs assessment under the GEF BUPUSA Project • Blue Deal-Land use mapping in Buzi and Water quality in Buzi and Pungwe	• Establishment Agreement • BUPUSACOM Hosting Agreement • Buzi Watercourse Agreement • Pungwe Watercourse Agreement • Save Watercourse Agreement • BUPUSA Data Sharing Procedures • Revised SADC Protocol on Shared Watercourses
	Transboundary Environmental and Social Assessment Guidelines developed and adopted			
	Basin-wide Water, Environment, Energy, Food nexus implementation guidelines adopted			
	BUPUSACOM procedures for notification of planned measures developed and adopted			
	Annexes of the Save Agreement finalised			
	Basin-wide harmonisation of pollution control legislation coordinated and memorandum of understanding on transboundary hazard control concluded			
Target 4: Efficient source-to-sea coordination structures operational in the basins	National Intersectoral Committees and a cross-sectoral transboundary coordination forum for source-to-sea management established			
	Awareness of source-to-sea management approach strengthened among key role-players and approach applied in practice			
Target 5: Transboundary source-to-sea management capacity strengthened at Member States level	Skills gaps and capacity requirements for key transboundary water management aspects (e.g., groundwater management, source-to-sea approach, international water law, resource mobilisation, etc.) identified and capacity-building plan developed and implemented			

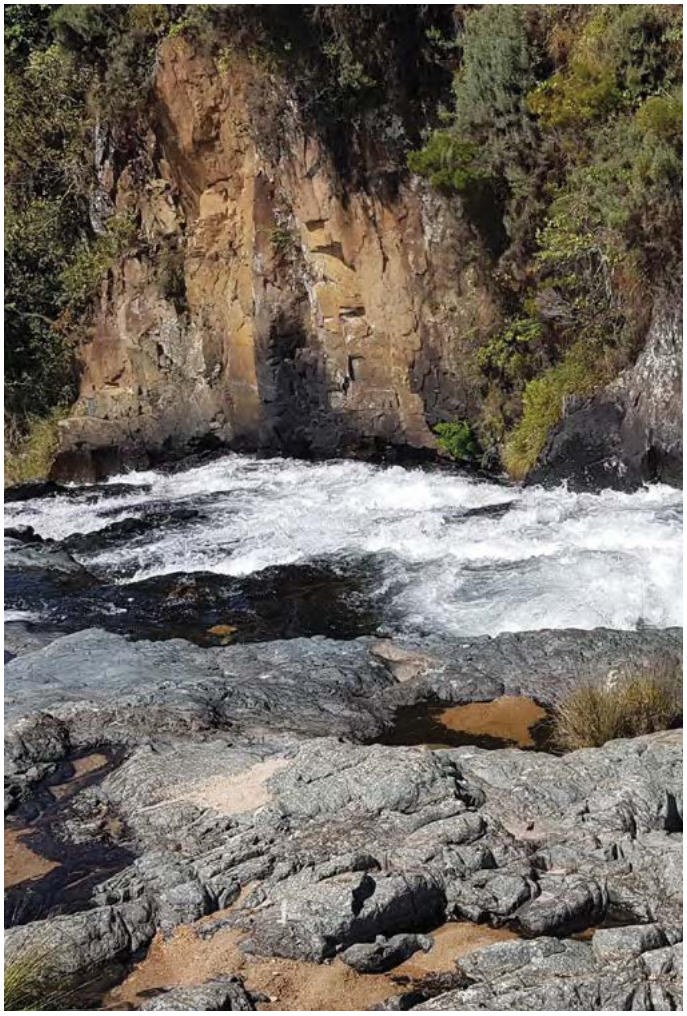


Table 6: Priority area 1

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Environmental priority interventions				
Priority area 1: Reduced availability of water				
Objective: The water resources of the basins are developed and managed sustainably for increased socioeconomic development and improved livelihoods				
Target 1: Improved understanding of groundwater resource potential and conjunctive use options for surface water and groundwater identified	Groundwater resources comprehensively mapped and potential to mitigate water supply shortage through sustainable conjunctive surface water and groundwater use evaluated	**SAP PCN 2:** Sustainable groundwater management in the BUPUSA basins in conjunction with (respectively) **Zim & Moz NAP PCN 5:** Conjunctive use of surface water and groundwater	**Basin-wide:** • GEF BUPUSA Project - Inclusion of groundwater into the JWC/BUPUSACOM - TDA • SADC Groundwater Management Institute (GMI) Mapping Groundwater-dependent Ecosystems • UNESCO Initiatives on Groundwater Hydrogeological Mapping and Assessment Programme (World Bank Project/DNGRH) • SADC-GMI Mapping Groundwater-dependent Ecosystems • Regional Climate Resilience Program for Eastern & Southern Africa Project (World Bank/DNGRH) **Zimbabwe:** • WASH initiatives (government departments, public-private partnerships) • GCF-GoZ: Mhakwe rehabilitation of irrigation pipeline and weir for irrigation and water supply • Drilling of boreholes under presidential scheme • Joint strategy on protecting groundwater recharge zones, well fields, wetlands, and natural springs • Upgrading and expanding the hydrometric network through the following projects: • Data Integration platform (e.g., ZEDNET Software) • Joint blitz programmes of continuous monitoring of hot spot rivers (Haroni, Nyamukuwara, Nyakaunga, Mutare) by EMA, Chipinge RDC, police, ZINWA, Buzi Sub-catchment – Buzi • GCF installing automatic gauging stations in Tokwe river, Shashe, and Bindamombe – Save	**Basin-wide:** • Buzi Watercourse Agreement • Pungwe Watercourse Agreement • Save Watercourse Agreement • Buzi IWRM Strategy • Pungwe IWRM Strategy • Save IWRM Strategy **Zimbabwe:** • National Water Policy • Water Resources Strategy • Water Resources Master Plan • Optimal Strategic Hydrometric Network • Buzi Surface Water Assessment - Pungwe Basin Transboundary • Integrated Water Resources Management and Development Programme (PP1) • Buzi Water Sector Study • GEF BUPUSA Hydrometric Network Design • SADC-HYCOS Hydrometric Network Design Report (Phase 3) • SADC-GMI Hydrogeological Portal • Met Services Bulletins • Hydrological Bulletins (Department of Water Resources Development and Utilisation, ZINWA) • Pungwe Water Sector Study (Consultec, 2011) • Met Services (Integrated Database) • Wetlands Policy **Mozambique:** • National Water Policy • National Water Resources Strategy • Water Resources Master Plan • Mozambique Strategic Hydrometric Network Report- Pilot Project on Climate Resilience . World Bank (PPCR)
	Groundwater resource plans for exploration, planning, and development formulated and applied			
	Groundwater sources developed and conjunctive use schemes implemented			
	Water conservation measures and managed aquifer recharge implemented in priority locations			
Target 2: Sustainability of rural water supply improved	Water source protection areas demarcated, gazetted, and sustainably managed, including prevention of saline intrusion in coastal areas			
	Rural water supply protected and improved through protection of catchments and groundwater recharge zones			
Target 3: Contamination of groundwater resources mitigated	Groundwater vulnerability mapping carried out, including determining impact of alien invasive species on groundwater, identification of recharge and discharge zones, and determination of diffuse and point sources of pollution			
	Guidelines for groundwater protection zoning and model regulations to manage groundwater use developed and awareness-raising campaigns implemented			
	Groundwater protection strengthened in national legislation			
	Enforcement capacity for groundwater protection strengthened			

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Environmental priority interventions				
Priority area 1: Reduced availability of water				
Objective: The water resources of the basins are developed and managed sustainably for increased socioeconomic development and improved livelihoods				
			• UNESCO Project (flood risk mapping in Chipinge and Chimanimani) – Save • UNDP Project: installation of radar sensors (Birchenough Bridge) – Save **Mozambique:** • WASH initiatives under different nongovernmental organisations (UNICEF, World Vision, etc.) • Hydrogeological Mapping and Assessment Programme (World Bank Project/DNGRH)	• Buzi Surface Water Assessment, AfDB • Buzi Water Sector Study (PP2) • Regulation of raw water quality standards and effluent discharges • Regulation of research and exploration of groundwater
Target 4: Adequate water infrastructure for sustainable socioeconomic development ensured	Appropriate storage and conveyance infrastructure identified, financing secured, and infrastructure constructed	**SAP PCN 3**: Improving sustainable water supply for socioeconomic development in the BUPUSA basins in conjunction with (respectively) **Zim and Moz NAP PCN 6**: Water demand management and water use efficiency	**Zimbabwe**: • Water allocation through permits and agreement (by ZINWA, CCs and SCCs) • Water resources management by ZINWA, CCs and SCCs • Local authorities, e.g., Mutare, Mutasa, Chipinge, and Chimanimani towns (water rationing), Masvingo, Hwedza, Chiredzi, etc. • Decentralisation programmes/initiatives (central government) • Climate-smart agriculture, e.g., Agroecology (Fambidzanai Permaculture Centre) **Mozambique**: • Regulation of licences, concessions, and raw water tariffs • Administration of water use permits • Construction of excavated reservoirs • WASH initiatives • National Rural Water and Sanitation Program • Local authorities, e.g., Manica, Chimoio, Beira, Dondo, Nhamatanda	**Basin-wide**: • BUPUSA Water Sharing Agreements • BUPUSA Water Sector Studies • BUPUSA Monographs **Zimbabwe**: • Water Act • Small and Medium Dam Strategy • Devolution and Decentralisation Policy, 2020 • National Agriculture Policy Framework 2019-2030 **Mozambique**: • Water Resources Master Plan • Water Resources Strategy • Water Law
	Investments in sustainable irrigation project promoted and supported			
Target 5: Water use efficiency increased	Dam operating rules harmonised basin-wide for increased water use efficiency			
	Water demand management approaches and tools implemented (including water pricing)			
	Non-revenue water in urban and growth centres' water systems reduced			
	Irrigation efficiency increased and climate-smart agriculture practices rolled out			

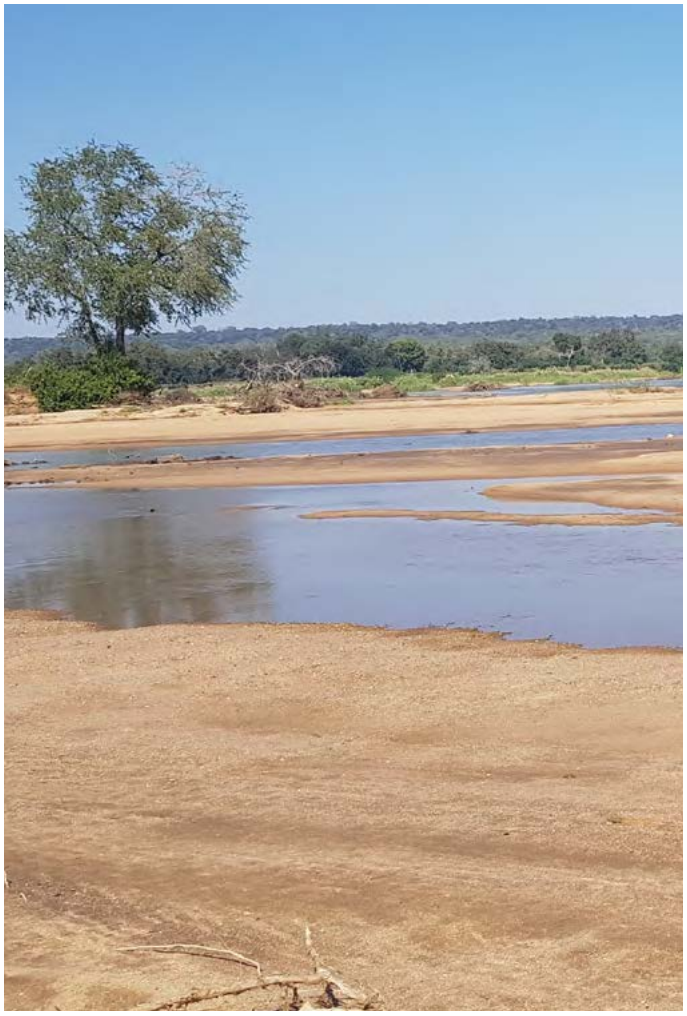


Table 7: Priority area 2

Targets	Project concept note	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 socioeconomic development and the functioning of healthy ecosystems				
Target 1: Status of basin ecosystem health understood	Joint Basin Survey for key ecosystem health parameters carried out every five years	**SAP PCN 4**: Reducing water and environmental pollution in the BUPUSA basins in conjunction with (respectively) **Zim and Moz NAP PCN 2**: Improved water quality in the BUPUSA basins	**Zimbabwe**: • ZINWA, EMA monitoring plans • Standards Association of Zimbabwe – standard setting • EMA, Chipinge RDC, police, ZINWA, Buzi Sub-catchment: Joint blitz programmes of continuous monitoring of illegal gold panning on Haroni River – Buzi • EMA: Rehabilitation of mined-out areas in Haroni channel – Buzi • EMA, City of Mutare, police, ZINWA, Pungwe Sub-catchment and Mutare Border Timbers: Joint programme of continuous monitoring of Nyamukwarara and Nyakaunga rivers and other gold panning hot spots – Pungwe • EMA: 15 water quality monitoring points in Odzi and Mutare rivers, 18 in Save tributaries, and all effluent discharge points in sugar and tea plantations in the catchment – Save **Mozambique**: • ARA-Centro, IP annual monitoring plans • Preparation of regulations on raw water quality standards and setting of pollution rates • Regional Climate Resilience Program for Eastern & Southern Africa • Establishment of Artisanal Miners Association • Environmental Education Programmes • Territorial/Land use planning	**Basin-wide**: • BUPUSA Water Sharing Agreements • BUPUSA IWRM Strategies • World Health Organization standards on water quality **Basin-wide**: • BUPUSA Water Sharing Agreements • BUPUSA IWRM Strategies • World Health Organization standards on water quality **Zimbabwe**: • EMA Act and Regulations • Mines and Minerals Act and Regulations • ZINWA Act and Regulations • Local Environmental Action Plans • EMA State of Environment Reports • Pungwe Project Second Phase (PP2) Pungwe Gold Panning Strategy • Urban Act • Public Health Act • Water Act • Civil Protection Act **Mozambique**: • Water Law • Environment Law • Water Resources Master Plan • Water Resources Strategy • Environmental Strategy for the Sustainable Development of Mozambique
	Basin-wide environmental water quality guidelines and monitoring system developed as part of basin-wide environmental monitoring systems			
Target 2: Saltwater intrusion prevented	Technical solutions against saline water intrusion assessed and implemented where feasible			
Target 3: Pollution from point and non-point sources effectively mitigated	Sustainable agriculture practices promoted to reduce pollution			
	Urban solid waste and effluent management facilities improved and capacities strengthened			
Target 4: Pollution from artisanal mining, especially from heavy metals, reduced	Mining cooperatives/associations established for artisanal miners			
	Technical assistance provided and support infrastructure constructed (e.g., off-river panning facilities) to reduce environmental impact			

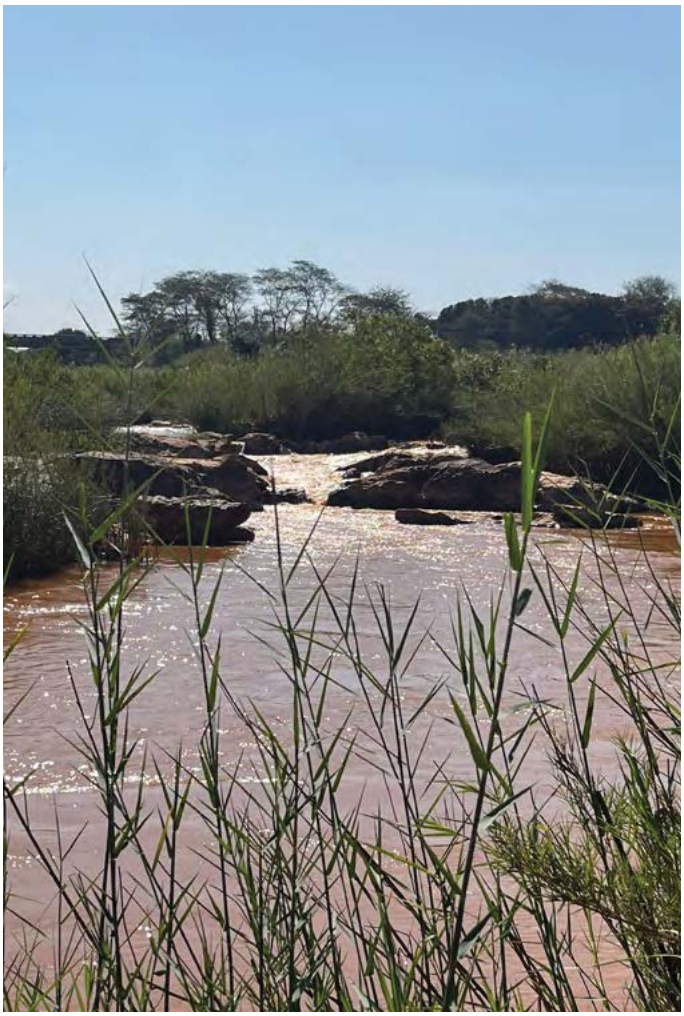


Table 8: Priority area 3

Targets	Project concept note	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: Deforestation halted and reversed	Degradation of critical forest areas halted; forest areas rehabilitated (e.g., through afforestation) Deforestation from charcoal burning halted	**SAP PCN 5**: Rehabilitation of land degradation hot spots in the BUPUSA basins in conjunction with (respectively) **Zim and Moz NAP PCN 3**: Sustainable land management	**Basin-wide:** • GEF BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins **Zimbabwe:** • Environmental/Catchment Protection (ZINWA, EMA, Sub-catchments) • ZINWA (Hydrographic Surveys and Sediment Sampling) • Soil and water conservation initiatives by Ministry responsible for Agriculture • Establishment of cooperatives for gold panning • Rehabilitation of mined-out areas on Haroni River channel and banks – Buzi • GEF 7: Sustainable land management (doing capacity building, nutrition gardens, gully reclamation, fire management and afforestation in Chipinge and Chimanimani with the help of the Buzi Sub-catchment and EMA) • Zimbabwe Environmental Law Association: Capacitation of farmers supported by Oxfam on environmental management planning and conflict management – Save • In Gutu wards 13, 14 and 15: Development Aid from People to People Zimbabwe installing community gardens and farmer training in Gutu wards 14 and 15 on land management – Save • GEF 7: Gully reclamation, afforestation, and capacity-building training in schools and communities in Buhera – Save • International Union for Conservation of Nature projects • Practical action (nutrition gardens, wetland protection and beekeeping in wetland-protected areas in Bumba, Biriiri, and Nhedziwa areas – Buzi	**Zimbabwe:** • ZINWA Act and Catchment Outline Plans • Forestry Act • Communal Land Forest Produce Act • Forestry Policy • Mines and Minerals Act • Lands Act • Local Authorities Act • Spatial Planning Act • Water Act • EMA Act • Wildlife Protection Act • National Land Use Plans (Local Government, Local Authorities and RDCs) • Land and water use strategy in Pungwe Basin • Buzi Basin Strategy • Local Environmental Action Plans • EMA State of Environment Reports • Traditional Leaders Act **Mozambique**: • Land Law • National Land Use Plans • National Reforestation Strategy • Action plan for the prevention and control of soil erosion • Environmental Strategy for the Sustainable Development of Mozambique • District Land Use Plan • Strategic plans for district development • Mangrove management strategy
	Livelihood alternatives piloted through uptake of renewable energy generation (solar, micro-hydro) Enforcement of regulations for sustainable timber harvesting strengthened			
Target 2: Erosion and sedimentation reversed in priority areas	Erosion hot spots identified and rehabilitated			
	Artisanal mining hot spots sustainably managed			
	Wetland degradation halted and wetlands rehabilitated in selected hot spots			

Targets	Project concept note	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				
			• UNDP-GCF in Shashe, Tokwe, and Bindamombe: Wetland protection in Bikita (funded by Christian Care) – Save **Mozambique:** • Sustainable Land and Water Resources Management Project • Agriculture and Natural Resource Landscape Management Project • Establishment of cooperatives for gold panning • Community reforestation programmes • National Mangrove Restoration Programme – Sofala	

Table 9: Priority area 4

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Priority area 4: Changes in flow regime				
Objective: The adverse effects of the changed hydrological regime are mitigated				
Target 1: Basin-wide environmental flows regime adopted and implementation ongoing	Environmental flows regime for the basins determined and agreed Basin-wide environmental flows procedures agreed and implemented Basin-wide environmental flow monitoring system established, applied, and integrated with the WIS	**SAP PCN 6:** Basin-wide environmental flows regime in conjunction with **Zim and Moz PCN 4**: Implementation of environmental flows	**Basin-wide:** • GEF BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins – Pungwe environmental flows studies	**Basin-wide:** • BUPUSA Water Sharing Agreements • BUPUSA IWRM Strategies **Zimbabwe:** • EMA Act • Local Environmental Action Plans • Water Act • ZINWA Act **Mozambique:** • Water Act • Environmental Law • National Water Resources Master Plan • National Reforestation Strategy • River Basin Plans (ARA-Centro, DNGRH)

Table 10: Priority area 5

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Environmental priority interventions				
Priority area 5: Increase in extreme climate events – floods and droughts				
Objective: The climate resilience of the basin population is strengthened				
Target 1: Climate risks and resulting socioeconomic vulnerabilities for the basin population identified and resilience measures adopted	Environmental and social vulnerability mapping carried out	**SAP PCN 7:** Strengthening climate resilience in the BUPUSA basins in conjunction with (respectively) **Zim and Moz PCN 1:** Strengthening climate resilience in the BUPUSA basins	**Basin-wide:** • GEF BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins **Basin-wide:** • GEF BUPUSA Project: Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins • UNESCO Project: A Community-focused flood early warning system for the BUPUSA transboundary basins **Zimbabwe**: • National Climate Outlook Forum • UNDP-GCF automatic gauging stations (Save Birchenough Bridge), automatic weather stations in schools – one in Buhera • Civil Protection Unit: Disaster Risk Reduction awareness programmes • Civil Protection: Disaster Risk Reduction strategies and monitoring • International Fund for Agricultural Development, United Nations Office for Project Services (UNOPS) and Cyclone Idai Recovery Project, Gudyanga and Tonhorai rehabilitation of boreholes, canals and pumps • UNDP: weather forecasting equipment installation in schools in Murambinda, Chipinge and Chimanimani • Local Initiatives and Development Agency: Disaster Risk Management (funded by French Agency for Cooperation) • Climate Adaptation Water and Energy Project – UNDP supported by the Foreign, Commonwealth and Development Office • Tobacco Wood Energy Programme – Buzi	**Basin-wide:** • Buzi IWRM Strategy • Pungwe IWRM Strategy • Save IWRM Strategy **Zimbabwe**: • National Climate Policy • Climate Change National Adaptation Plan • National Climate Policy • Climate Change Response Strategy • Climate Change Gender Action Plan • Water Resources Management Strategy • Water Resources Master Plan • Catchment Outline Plans • Disaster Risk Management Contingency Plans • Disaster Risk Reduction Master Plans **Mozambique**: • Disaster Risk Reduction Master Plan • Mozambique Water Resources Master Plan • Mozambique Climate Change Strategy • Joint Programme on Environment Mainstreaming and Adaptation to Climate Change in Mozambique
	Basin-wide climate risk atlas produced and regularly updated			
	Climate risk mitigation/community-based disaster risk management and adaptation plan and community resilience strategy developed and operational			
Target 2: Effective climate disaster warning systems operational	Basin-wide climate disaster early warning and risk management system (with a focus on flood and drought monitoring and early warning) developed and established			
Target 3: Drought resilience strengthened through community-level investments and business development	Awareness of water harvesting practices techniques raised and water harvesting infrastructure established			
	Capacity of vulnerable communities for floods and drought adaptation strengthened			
	Voluntary resettlement of communities and households currently located on low-lying areas to less flood-prone areas supported			
	Community livelihood infrastructure (e.g., small farm dams, groundwater supply, community-level hydro and solar energy, etc.) developed			
	Community-led green businesses established and supported, and operating profitably (e.g., in waste collection, recycling, and reuse in urban and peri-urban areas, especially in the downstream areas near the estuaries; innovative finance and value chain access for small farmers)			

Targets	Project concept note	Project concept note	Ongoing initiatives	Corresponding agreements/strategies/plans/ programmes
Environmental priority interventions				
Priority area 5: Increase in extreme climate events – floods and droughts				
Objective: The climate resilience of the basin population is strengthened				
			• Duri and Buwu hydropower schemes (NRE): Duri and Buwu hydropower schemes: Nyangani Renewable Energy – Pungwe/Buzi – Pungwe/ Buzi • Hauna growth point water supply (ZINWA) – Pungwe • UNDP-GEF Limpopo in Chivi (Wards 3, 8, 15, 16, 25, 29) doing a project on environment, nutrition gardens • Resilience Anchors in Chiredzi (Wards 1, 2 ,23, 24,) doing boreholes, nutrition gardens, human wildlife conflict • Mercy Corps, World Vision, and Methodist Development and Relief Agency: 22 piped water schemes in Buhera – Save • Local Initiatives and Development Agency: Disaster Risk Management (funded by French Cooperation) • Development Aid from People to People Zimbabwe: Promoting climate resilience livelihoods and ecosystems – Save **Mozambique** • Mozambique Climate Resilience Project • Blue Deal Project • Regional Climate Resilience Program for Eastern & Southern Africa • Contingency Plans • National Climate Outlook Forum • Mozambique Water Resources Resilience Project (DNGRH/World Bank)	

Photo credit: IFRC

V

Project concept notes

Project concept notes

The SAP has been designed as a portfolio of PCNs. These PCNs are developed along themes of interventions. Since many interventions contribute to addressing more than one identified priority area, the PCNs are by their nature cross-cutting in their approach to addressing social and environmental problems. The PCNs in Annex 1 have been developed for the initial ten-year implementation period of SAP. New and/or updated project concepts need to be developed for every subsequent update of the SAP.

VI

SAP implementation, coordination, and monitoring

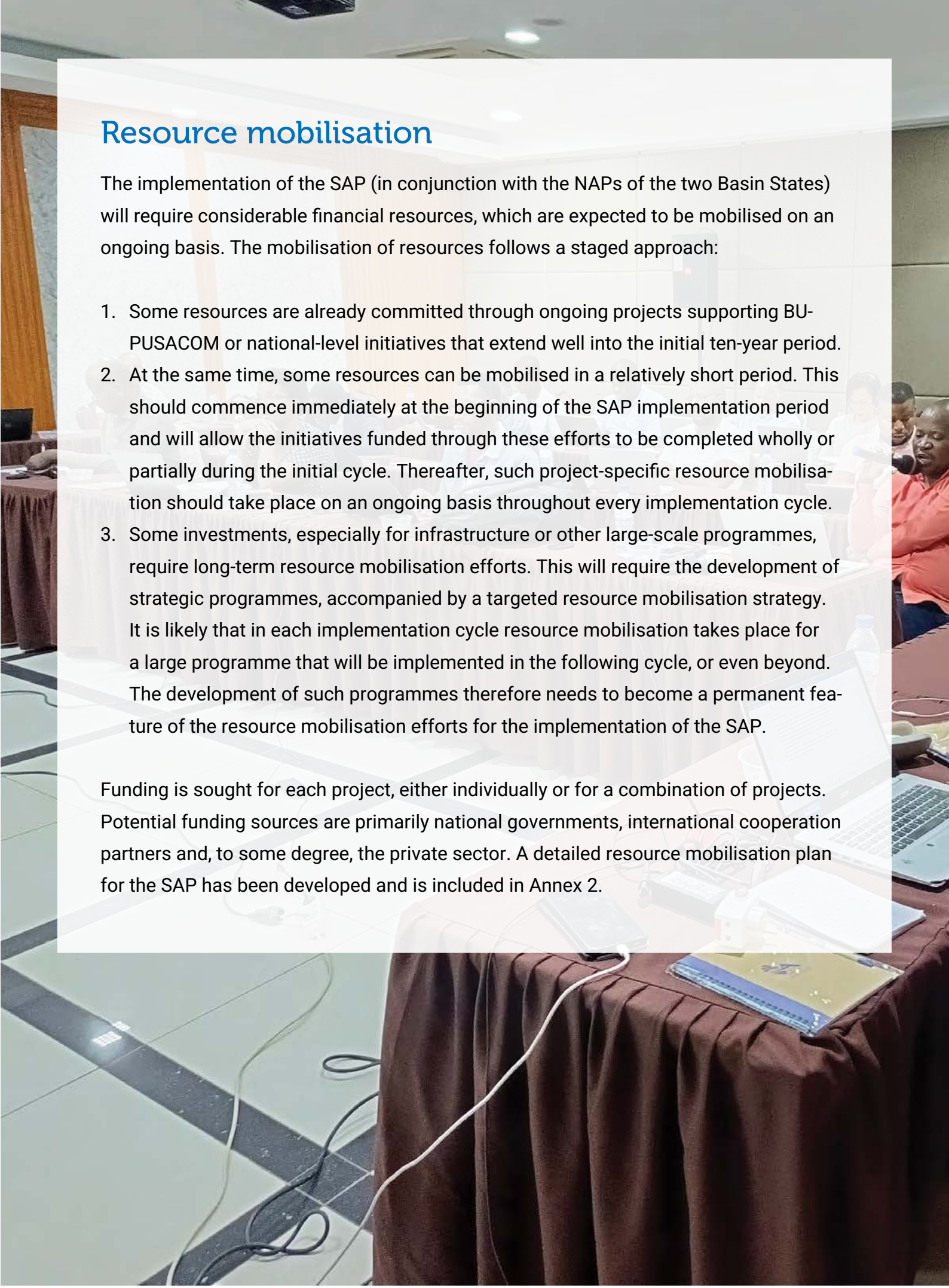
SAP implementation, coordination, and monitoring

In line with the project approach to SAP, implementation is not through a central implementation agency responsible for the entire SAP. 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 project level is described in each PCN.

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

VII

Resource mobilisation



Resource mobilisation

The implementation of the SAP (in conjunction with the NAPs of the two Basin States) 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 BUPUSACOM or national-level initiatives that extend well into the initial ten-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 SAP 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 SAP.

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. A detailed resource mobilisation plan for the SAP has been developed and is included in Annex 2.

Annex 1: Project Concept Notes

Table 11: SAP Project Concept Note 1: Strengthening basin-wide source-to-sea management capacity in the Buzi, Pungwe, and Save basins

Core data	
Project number	SAP PCN 1
Project title	Strengthening basin-wide source-to-sea management capacity in the BUPUSA basins
SAP priority area	Transboundary governance
Short description	The project seeks to strengthen the collaborative management capacity of the recently established BUPUSACOM, develop essential transboundary basin management instruments, and establish effective source-to-sea management structures.
Project rationale	
Background	Mozambique and Zimbabwe have recently concluded a watercourse agreement for each of the BUPUSA basins, and established the BUPUSA Watercourse Commission as a tri-basin commission. For effective, collaborative source-to-sea management of the three basins it is now essential that the institutional capacity of BUPUSACOM is strengthened and critical transboundary management instruments are adopted. In parallel, BUPUSACOM needs to be integrated with effective source-to-sea management structures, especially to enhance coordination and cooperation with coastal management institutions at national and regional levels.
Project Objective	The regional governance frameworks for transboundary basin management are strengthened and the source-to-sea management approach is established in basin management.
Integration with relevant ongoing projects/initiatives	This project will be a follow-on to the GEF-funded project Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins and builds on the work carried out under that project and the joint establishment by the Basin States of BUPUSACOM.
Project Outcomes	1. Institutional, technical, and operational capacity of BUPUSACOM strengthened 2. Effective mechanisms for transboundary data and information exchange between BUPUSACOM Member States in place 3. Transboundary management instruments adopted and applied 4. Efficient source-to-sea coordination structures operational in the basins 5. Transboundary source-to-sea management capacity strengthened at Member States level
Technical Approach	**The project comprises five outcomes with a total of 15 outputs.** **Outcome 1:** Institutional, technical, and operational capacity of BUPUSACOM strengthened focuses on building the institutional, technical, and operational capacity of BUPUSACOM and is critical to support BUPUSACOM as a nascent organisation to effectively fulfil its transboundary coordination and management mandate. This is done through strengthening institutional structures and processes, and human resource capacity strengthening at organisational and individual levels. Outcome 1 comprises the following outputs: Output 1.1: Institutional, technical, and operational capacity needs assessment carried out and short-, mid-,and long-term capacity development plan adopted Output 1.2: Institutional, technical, and operational capacity of BUPUSACOM enhanced through implementation of priority actions identified in capacity development plan (including staff recruitment) Output 1.3: Comprehensive organisational procedures for BUPUSACOM developed (e.g., financial management, HR management, procurement, etc.) Output 1.4: Gendered approach integrated into programming and gender-responsive monitoring and evaluation system developed and implemented for tracking programmes and projects **Outcome 2:** Effective mechanisms for transboundary data and information exchange between BUPUSACOM Member States in place consolidates transboundary information sharing as a basis for evidence-based decision-making.

Core data	
	It will establish the first full basin-wide environmental monitoring system, as well as a WIS within the BUPUSACOM Secretariat, as a central repository for all relevant water and natural resources management information. The use in management decision-making of the stored information will be ensured through the development and establishment of a Decision Support System that provides scientific and technical guidance for the decision-making of the Commission and other relevant role-players. A groundwater monitoring network will be developed and integrated with the WIS. In combination, these activities also support the implementation of the BUPUSACOM transboundary data and information exchange procedures. Outcome 2 will be implemented through the following outputs: Output 2.1: Basin-wide water/environmental monitoring system established and fully operational Output 2.2: Needs for groundwater monitoring identified, monitoring objectives set, and basin-wide groundwater monitoring network designed and integrated with WIS Output 2.3: WIS and Decision Support System operational within the BUPUSACOM Secretariat Output 2.4: Procedures for data and information exchange between BUPUSACOM Member States effectively applied, including groundwater data **Outcome 3:** Transboundary management instruments adopted and applied supports the development and adoption by the Basin States of critical transboundary basin management instruments that support sustainable investments in the socioeconomic development of the basins' water resources. These tools will ensure that decisions in managing the transboundary river basin using a source-to-sea approach will enhance environmental security while at the same time ensuring improved investments in socioeconomic development and poverty reduction. The outcome will be implemented through the following outputs: Output 3.1: Transboundary IWRM/water resources development plan developed Output 3.2: Transboundary Environmental and Social Assessment Guidelines developed and adopted Output 3.3: Basin-wide Water, Environment, Energy, Food nexus implementation guidelines adopted Output 3.4: BUPUSACOM procedures for notification of planned measures developed and adopted Output 3.5: Annexes of the Save Agreement finalised Output 3.6: Basin-wide harmonisation of pollution control legislation coordinated and memorandum of understanding on transboundary hazard control concluded **Outcome 4:** Efficient source-to-sea coordination structures operational in the basins focuses on cross-sectoral integration of transboundary natural resources management, with emphasis on the adoption of a source-to-sea management approach and the establishment of suitably integrated management structures for that. The outcome will be achieved through the following outputs: Output 4.1: National Intersectoral Committees and a cross-sectoral transboundary coordination forum for source-to-sea management established Output 4.2: Awareness of source-to-sea management approach strengthened among key role-players and approach applied in practice **Outcome 5:** Transboundary source-to-sea management capacity strengthened at Member States level complements the strengthening of BUPUSACOM by addressing skills gaps and capacity requirements at Member States level to ensure that the necessary capacity for the effective operation of BUPUSACOM is not only available in the BUPUSACOM Secretariat but is also matched in national organisations that are represented in the Commission structures. This will be implemented through the following output: Output 5.1: Skills gaps and capacity requirements for key transboundary water management aspects (e.g., groundwater management, source-to-sea approach, international water law, resource mobilisation, etc.) identified and capacity-building plan developed and implemented
Assumptions and risks	The two basin countries have a history of coordination and willingness to implement joint management activities. The project activities are proposed by the countries themselves and have involved stakeholders from a wide variety of sectors. It is therefore assumed that there is an ongoing willingness to develop and implement basin-wide joint management frameworks and the project will provide the necessary technical support to strengthen these frameworks. The project risk is considered low.
Implementation	
Project duration	Four years
Project cost	Estimated USD 4,000,000 (four million)
Proposed funding sources	GEF
Implementation mechanism	GEF implementing agency: International Union for Conservation of Nature projects Executing agency: Global Water Partnership Southern Africa The project can be combined with PCN 6 to form one GEF-funded SAP implementation project.

Table 12: SAP Project Concept Note 2: Sustainable groundwater management in the Buzi, Pungwe, and Save basins

Core data	
Project number	SAP PCN 2
Project title	Sustainable groundwater management in the BUPUSA basins
SAP priority area	Reduced availability of water; deterioration of water quality
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 undertake protective measures for groundwater resources.
Project rationale	
Background	Groundwater is a critical resource in the BUPUSA basins, with the majority of the rural population being dependent on local groundwater resources for household water supply and livelihoods (e.g., livestock 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 Pungwe, Buzi and Save Basins. The project aligns with ongoing national government activities related to groundwater assessment and exploitation.
Project Outcomes	1. Improved understanding of groundwater resource potential and conjunctive use options for surface water and groundwater identified 2. Sustainability of rural water supply improved 3. Contamination of groundwater resources mitigated
Technical Approach	**Outcome 1:** Improved understanding of groundwater resource potential and conjunctive use options for surface water and groundwater identified 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. This is complemented by practical aquifer management interventions, including managed aquifer recharge, and the development of conjunctive groundwater use schemes. The outcome has the following outputs: Output 1.1: Groundwater resources comprehensively mapped and potential to mitigate water supply shortage through sustainable conjunctive surface and groundwater use evaluated Output 1.2: Groundwater resource plans for groundwater exploration, planning, and development formulated and applied Output 1.3: Groundwater sources developed and conjunctive use schemes implemented Output 1.4: Water conservation measures and managed aquifer recharge implemented in priority locations **Outcome 2:** Sustainability of rural water supply improved complements the previous outcome, with a direct focus on improving rural water supply through implementing protective measures for water source and catchments, especially groundwater recharge zones. Output 2.1: Water source protection areas demarcated, gazetted, and sustainably managed, including prevention of saline intrusion in coastal areas Output 2.2: Rural water supply protected and improved through protection of catchments and groundwater recharge zones **Outcome 3:** Contamination of groundwater resources mitigated complements the two previous outcomes, with a clear focus on preventing groundwater pollution. This also includes interventions targeted at strengthening groundwater protection in national legislation and its enforcement through responsible national entities. The outcome has the following outputs: Output 3.1: Groundwater vulnerability mapping carried out, including determining impact of alien invasive species on groundwater, identification of recharge and discharge zones, and determination of diffuse and point sources of pollution Output 3.2: Guidelines for groundwater protection zoning and model regulations to manage groundwater use developed and awareness-raising campaigns implemented Output 3.3: Groundwater protection strengthened in national legislation Output 3.4: Enforcement capacity for groundwater protection strengthened

Core data	
Assumptions and risks	Environmental pressure, and as a result social pressure, is rising in the project area. During the stakeholder consultations for the SAP there was therefore great support for the proposed interventions and consensus that these interventions will contribute to addressing some of the environmental and social pressures in the basin.
Implementation	
Project duration	Four years
Project cost	Estimated USD 4,000,000 (four million)
Proposed funding sources	TBD
Implementation mechanism	Dependent on funding mechanism

Table 13 :SAP Project Concept Note 3: Improving sustainable water supply for socioeconomic development in the Buzi, **Pungwe, and Save basins**

Core data	
Project number	SAP PCN 3
Project title	Improving sustainable water supply for socioeconomic development in the BUPUSA basins
SAP priority area	Reduced availability of water
Short description	The project aims at assuring sustainable water supply for socioeconomic development through a dual approach of increasing water storage/use infrastructure, and improving water use efficiency
Project rationale	
Background	The BUPUSA basins increasingly experience a (temporary) reduced availability of water. This reduces socioeconomic development opportunities and leads to a range of environmental impacts described in detail in the TDA. The causes for a reduced availability of water are partially 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 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.
Project Objective	Adequate water supply for sustainable socioeconomic development in the basins is secured.
Integration with relevant ongoing projects/initiatives	The project/programme needs to be driven and implemented through national governments as part of ongoing and planned infrastructure development and construction. Basin-wide coordination is to be carried out under the auspices of BUPUSACOM in conjunction with other role-players in the field of regional infrastructure planning.
Project Outcomes	1: Adequate water infrastructure for sustainable socioeconomic development ensured 2: Water use efficiency increased
Technical Approach	**Outcome 1:** Adequate water infrastructure for sustainable socioeconomic development ensured is aimed at facilitating water-related investments for improved socioeconomic development. The investments focus on the two priority aspects of increasing water storage infrastructure and the development of irrigation projects. Output 1.1: Appropriate storage and conveyance infrastructure identified, financing secured, and infrastructure constructed Output 1.2: Investments in sustainable irrigation projects promoted and supported **Outcome 2:** Water use efficiency increased forms the second pillar of this initiative and is geared towards improving the water use efficiency of existing infrastructure through a combination of operational and regulatory measures, and infrastructure and technology investments. Specifically, the outputs are the following: Output 2.1: Dam operating rules harmonised basin-wide for increased water use efficiency Output 2.2: Water demand management approaches and tools implemented (including water pricing) Output 2.3: Non-revenue water in urban and growth centres' water systems reduced Output 2.4: Irrigation efficiency increased and climate-smart agriculture practices rolled out
Assumptions and risks	The project includes investments in infrastructure projects, including in the field of agriculture. There is a risk that such investments could be affected by extreme climate events, i.e., severe floods or prolonged droughts. However, the development of such infrastructure is needed to mitigate the exact same climate threats.
Implementation	
Project duration	Three years for operational and regulatory interventions For infrastructure projects, dependent on nature and scale of project
Project cost	Three years for operational and regulatory interventions For infrastructure projects, dependent on nature and scale of project
Proposed funding sources	National government (including infrastructure loans, with possibility of grants for infrastructure project preparation) Private sector (i.e., commercial agriculture)
Implementation mechanism	Dependent on scale and funding mechanism for each specific intervention

[1] This concept note differs from the others in the sense that it entails large-scale infrastructure developments. As such the PCN constitutes a programme more than an individual project. Given the timelines and volume of required financial resources for infrastructure development it is likely that the programme needs to be split into several project-specific concept notes once the exact projects planned are identified.

Table 14: SAP Project Concept Note 4: Reducing water and environmental pollution in the Buzi, Pungwe, and Save basins

Core data	
Project number	SAP PCN 4
Project title	Reducing water and environmental pollution in the BUPUSA basins
SAP priority area	Deterioration of water quality
Short description	The project has the dual purpose of establishing adequate water quality and ecosystems' health standards and monitoring systems for the BUPUSA basins, and implementing measures that reduce pollution and mitigate its impacts.
Project rationale	
Background	Water quality deterioration is ranked as a severe problem in all BUPUSA basins, and is likely to increase further if adequate interventions are not implemented. 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, which is primarily linked to increased phosphorus and nitrogen concentrations from agricultural runoff, and contamination with pollutants, notably heavy metals used in artisanal mining.
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	The project aligns with ongoing water quality monitoring and enforcement activities carried out by responsible national government entities.
Project Outcomes	1: Status of basin ecosystem health understood 2: Saltwater intrusion prevented 3: Pollution from point and non-point sources effectively mitigated 4: Pollution from artisanal mining, especially from heavy metals, reduced
Technical Approach	The first element of the project aims at improving the level of understanding of the water quality and ecosystem health situation in the basins. In this context **Outcome 1:** Status of basin ecosystem health understood focuses on carrying out Joint Basin Surveys and improving the basin-wide water quality and ecosystem health monitoring systems (density and frequency) through the following outputs: Output 1.1: Joint Basin Survey for key ecosystem health parameters carried out every five years Output 1.2: Basin-wide environmental water quality guidelines and monitoring system developed as part of basin-wide environmental monitoring systems The second element of the project directly addresses some of the main causes of water pollution, with a focus on intervention in specific hot spot areas identified in the TDA. In this context **Outcome 2:** Saltwater intrusion prevented deals with the issue of saltwater intrusion in coastal/estuarine areas through the following output: Output 2.1: Technical solutions against saline water intrusion assessed and implemented where feasible **Outcome 3:** Pollution from point and non-point sources effectively mitigated provides for interventions in two key sectors contributing to pollution, i.e., the agriculture and urban waste sectors, through the following outputs: Output 3.1: Sustainable agriculture practices promoted to reduce pollution from farms Output 3.2: Urban solid waste and effluent management facilities improved and capacities strengthened **Outcome 4:** Pollution from artisanal mining, especially from heavy metals, reduced deals with (possibly) the most severe water quality problem in the basin by aiming to mitigate the impacts on water quality from artisanal mining through the following outputs: Output 4.1: Mining cooperatives/associations established for artisanal miners Output 4.2: Technical assistance provided and support infrastructure constructed (e.g., off-river panning facilities) to reduce environmental impact
Assumptions and risks	Challenging established practices in politically sensitive (artisanal mining) and economically important sectors requires political will. The interventions are therefore not geared at prohibiting important livelihood activities and instead focus on creating opportunities for a more sustainable approach, especially in the area of artisanal mining.

Implementation	
Project duration	Five years (revolving)
Project cost	USD 5,000,000 (five million) for initial interventions – likely to be more if support infrastructure for artisanal mining is rolled out on a larger scale
Proposed funding sources	Some of the interventions (especially on artisanal mining) could be combined with other PCNs for the next phase GEF project. Given the expected total GEF funding for the next phase, this would probably only allow for implementation in pilot sites. For a roll-out on a larger scale other financing sources should be considered. In addition to the national governments, this could include: Federal Ministry for Economic Cooperation and Development/KfW Development Bank African Development Bank Group
Implementation mechanism	Dependent on scale and funding mechanism

Table 15: SAP Project Concept Note 5: Rehabilitation of land degradation hot spots in the Buzi, Pungwe, and Save basins

Core data	
Project number	SAP PCN 5
Project title	Rehabilitation of land degradation hot spots in the BUPUSA basins
SAP priority area	Land degradation
Short description	The projects aims at halting and reversing the degradation of critical ecosystems with a geographical focus on particularly affected hot spot areas.
Project rationale	
Background	Poor land management practices have altered conditions of the land, affecting its interactions with water and having far-reaching consequences for the health and integrity of riparian and aquatic ecosystems. The problem is common and widespread in the three basins, but certain hot spot areas are particularly affected.
Project Objective	Degraded critical ecosystems in the basins are rehabilitated and sustainably managed to ensure agricultural productivity and functioning ecosystem services.
Integration with relevant ongoing projects/initiatives	The projects aligns with SAP PCN 4, notably the outcome on artisanal mining, since some of the most affected land degradation hot spots are in areas where artisanal mining is most prevalent.
Project Outcomes	1: Deforestation halted and reversed 2: Erosion and sedimentation reversed in priority areas
Technical Approach	The project focuses on ecosystem rehabilitation and protection of ecosystem services in the most affected geographical areas of the basin. In this context **Outcome 1:** Deforestation halted and reversed focuses on critical forest ecosystems and is implemented through the following outputs: Output 1.1: Degradation of critical forest areas halted; forest areas rehabilitated (e.g., through afforestation) Output 1.2: Deforestation from charcoal burning halted Output 1.3: Livelihood alternatives piloted through uptake of renewable energy generation (solar, micro-hydro) Output 1.4: Enforcement of regulations for sustainable timber harvesting strengthened **Outcome 2:** Erosion and sedimentation reversed in priority areas is directed at the prevention and reversal of erosion and the rehabilitation and sustainable management of critical wetlands. Output 2.1: Erosion hot spots identified and rehabilitated Output 2.2: Artisanal mining hot spots sustainably managed Output 2.3: Wetland degradation halted, and wetlands rehabilitated in selected hot spots
Assumptions and risks	The governments 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 (replicable)
Project cost	Initial phase estimated between USD 2,000,000 and 10,000,000 (two million and ten million) depending on number of sites, scale of afforestation, and provision of renewable energy generation infrastructure.
Proposed funding sources	Adaptation fund GCF Food and Agriculture Organization of the United Nations Others TBD
Implementation mechanism	Dependent on scale and funding source

Table 16: SAP Project Concept Note 6: Basin-wide environmental flows regime

Core data	
Project number	SAP PCN 6
Project title	Basin-wide environmental flows regime
SAP priority area	Changes in flow regime
Short description	The project aims 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 ecosystems, 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, while they are still to be done for the Buzi and Save basins. There is a need to carry out environmental flow assessments and to develop and implement a basin-wide environmental flows regime 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 builds on the environmental flows studies conducted as part of the GEF-funded project Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins.
Project Outcomes	Basin-wide environmental flows regime adopted and implementation ongoing
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:** Basin-wide environmental flows regime adopted and implementation ongoing Output 1.1: Environmental flows regime for the basins determined and agreed Output 1.2: Basin-wide environmental flows procedures agreed and implemented Output 1.3: Basin-wide environmental flow monitoring system established, applied, and integrated with the WIS
Assumptions and risks	The main assumption is that there will be a political willingness to implementing agreed environmental flows regime in accordance with the respective watercourse agreement, the agreed basin-wide environmental flows procedures, and national legislation. The main risks to the success of the project are: (i) lack of political will to implement the legislation in the basin countries; (ii) unwillingness to integrate environmental flows into administrative procedures, such as licensing; (iii) lack of capacity at basin and/or national level; and (iv) resulting non-compliance. The risk for political willingness is considered to be low, whereas the risk for capacity constraints hindering effective implementation is medium.
Implementation	
Project duration	Three years
Project cost	Estimated USD 2,000,000 (two 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 (ICPs)
Implementation mechanism	To be determined based on the selected approach for implementation (see proposed funding sources). Regardless of funding sources, the project should be implemented under the auspices of BUPUSACOM.

Table 17: SAP Project Concept Note 7: Strengthening climate resilience in the Buzi, Pungwe, and Save basins

Core data	
Project number	SAP PCN 7
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	Climate change is expected to amplify already existing water resources challenges in the BUPUSA basins. Furthermore, non-climatic factors such as land use, population growth, development, and others, in addition to climate variability and change, will add more stress to the water resources. Initiatives will need to be implemented to help the basins cope with changes in a positive manner to increase the adaptive capacity and lower the vulnerability of the basins' population.
Project Objective	The climate resilience of the basin population is strengthened.
Integration with relevant ongoing projects/initiatives	This project builds on the development of a flood early warning system undertaken as part of the GEF-funded project Management of Competing Water Uses and Associated Ecosystems in Pungwe, Buzi and Save Basins.
Project Outcomes	1: Climate risks and resulting socioeconomic vulnerabilities for the basin population identified and resilience measures adopted 2: Effective climate disaster warning systems operational 3: Drought resilience strengthened through community-level investments and business development
Technical Approach	The project has three inter-related elements, respectively focusing on determining climate risks and resulting social vulnerability, developing effective climate disaster warning systems, and strengthening community resilience through strengthening local climate awareness and investments in alternative livelihood options. **Outcome 1:** Climate risks and resulting socioeconomic vulnerabilities for the basin population identified and resilience measures adopted is geared at developing a detailed understanding of climate impacts and resulting vulnerabilities, the mapping of geographical risk areas, and the subsequent development of climate risk mitigation and adaptation strategies. This outcome has the following outputs: Output 1.1: Environmental and social vulnerability mapping carried out Output 1.2: Basin-wide climate risk atlas produced and regularly updated Output 1.4: Climate risk mitigation/community-based disaster risk management and adaptation plan and community resilience strategy developed and operational **Outcome 2:** Effective climate disaster warning systems operational complements the recently designed flood 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. Output 2.1: Basin-wide climate disaster early warning and risk management system (with focus on flood and drought monitoring and early warning) developed and established **Outcome 3:** Drought resilience strengthened through community-level investments and business development is directed at strengthening community adaptation capacity through investments in critical livelihood infrastructure (e.g., energy and water supply) and unlocking innovative economic development and livelihood opportunities. The outcome will be implemented through the following outputs: Output 3.1: Awareness of water harvesting practices techniques raised and water harvesting infrastructure established Output 3.2: Capacity of vulnerable communities for floods and drought adaptation strengthened Output 3.3: Voluntary resettlement of communities and households currently located on low-lying areas to less flood-prone areas supported Output 3.4: Community livelihood infrastructure (e.g., small farm dams, groundwater supply, community-level hydro and solar energy, etc.) developed Output 3.5: Community-led green businesses established, supported, and operating profitably (e.g., in waste collection, recycling, and reuse in urban and peri-urban areas, especially in the downstream areas near the estuaries; innovative finance and value chain access for small farmers)

Assumptions and risks	The project includes investments in local-level projects, including in the field of agriculture. 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.
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	Adaptation Fund GCF GEF
Implementation mechanism	Dependent on scale and funding arrangement

Technicians being trained on the use of hydro-metric equipment. The equipment is meant to aid the monitoring of floods in the tri-basin to improve disaster risk preparedness. Photo credit: GEF-BUPUSA Project

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