



FEASIBILITY ASSESSMENT SUMMARY

Blantyre Water Fund

February 2021



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1

Introduction and Context

This Feasibility Assessment investigates the potential for establishing a Water Fund(s) for the City of Blantyre, Malawi, and its key source water areas

Introduction and Context

The City of Blantyre has three (3) water sources: the Shire River, the Mudi Dam, and the Likhubula River (Mulanje Mountain).

Each of the three source water areas displays distinct dynamics, varied challenges and threats, and different opportunities for a prospective Water Fund.

Together these areas cover a large geographic scope and host a diverse landscape of stakeholders, some of whom are already driving various catchment management activities.

However, the existing activities have not had significant impact due to unsustainable and limited funding, insufficient geographic reach in implementation, and poor coordination.

The overarching water security challenge is constrained water supply: only 60% of the City of Blantyre's water demand is being met by current sources.

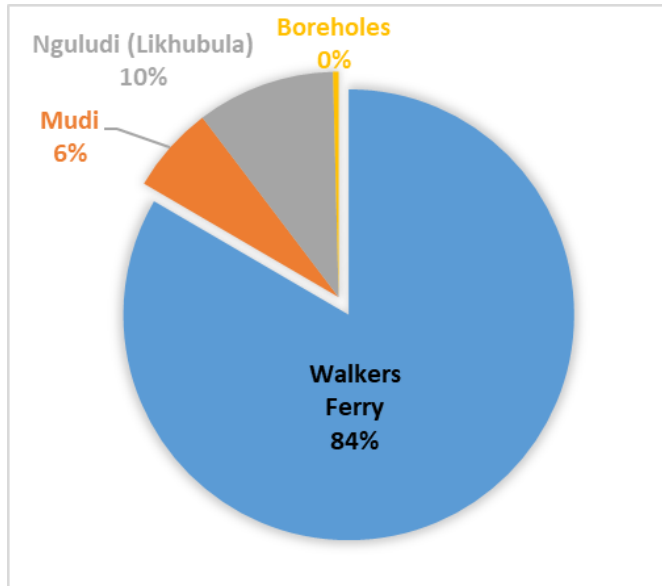
However, the drivers behind this water security challenge are distinct and diverse in each of the source water areas, meaning Nature-based Solutions (NbS) will have varying impact across the whole system.

This feasibility assessment suggests viable focus areas for the proposed water fund to move forward.

These suggestions seek to align the NbS that have the greatest potential impact (on water security and co-benefits) with the stakeholders that have the greatest interest and capacity.

Blantyre's current water supply and demand overview

The most recent water production figures for BWB Jan-Sep 2021



	Estimated water demand for Blantyre in 2020 (Sogreah, 2010) m ³ /d	Actual water supply from BWB in 2018/19 (Malawi Statistical Yearbook, 2020) m ³ /d	% of estimated demand met by supply
Domestic	55,000	47,700	73%
Institutional	10,000		
Industrial	20,000	3,300	17%
Losses	50,000	29,600	59%
Total	135,000	80,500	60%



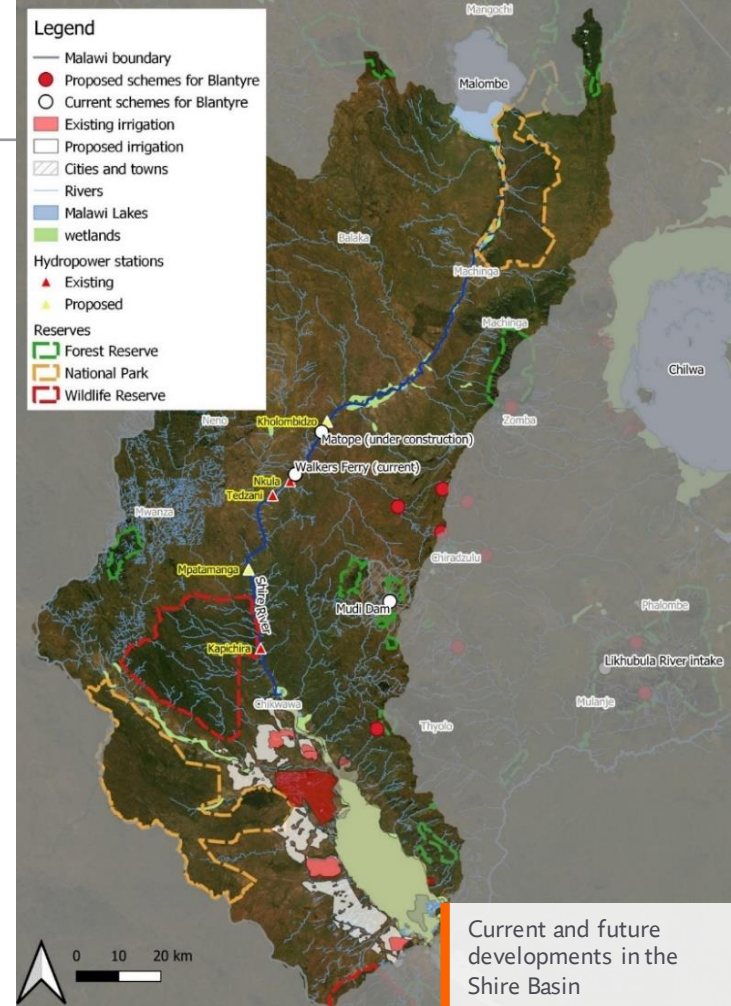
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What is the water security challenge?

*The City of Blantyre has insufficient supply to meet current and future demand, with a current water supply deficit of around **40%**.*

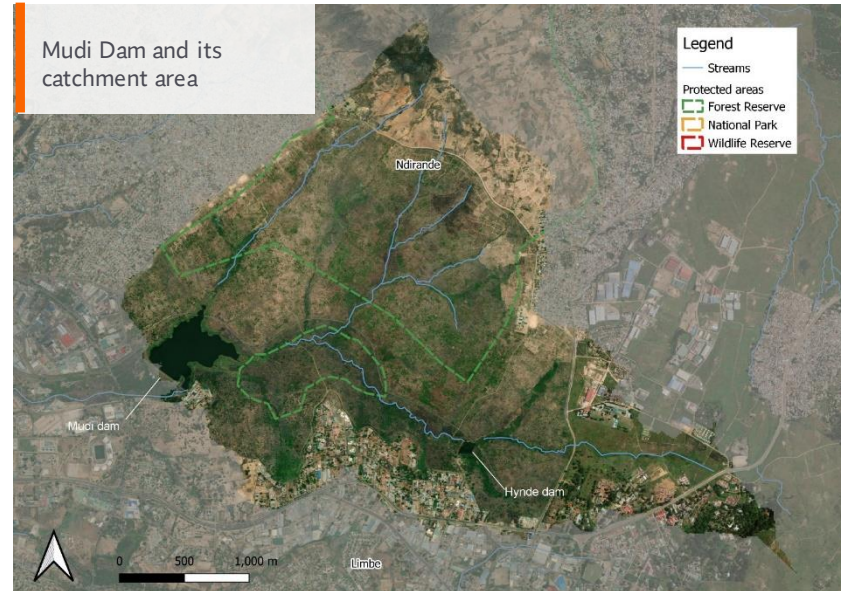
The Shire River

- The Shire River is Malawi's largest river and most important national water resource, fed from Lake Malawi. The Shire River provides, on average, **85%** of Blantyre's water.
- Its greatest water supply threats include **competing transboundary water resources demands, changing land use, deforestation, and high sedimentation rates** which impacts hydropower generation and abstraction capacity in the **Upper and Middle** Shire particularly.
- **In addition to sedimentation, Flooding** is a major concern, particularly in the **Lower** Shire River valley.



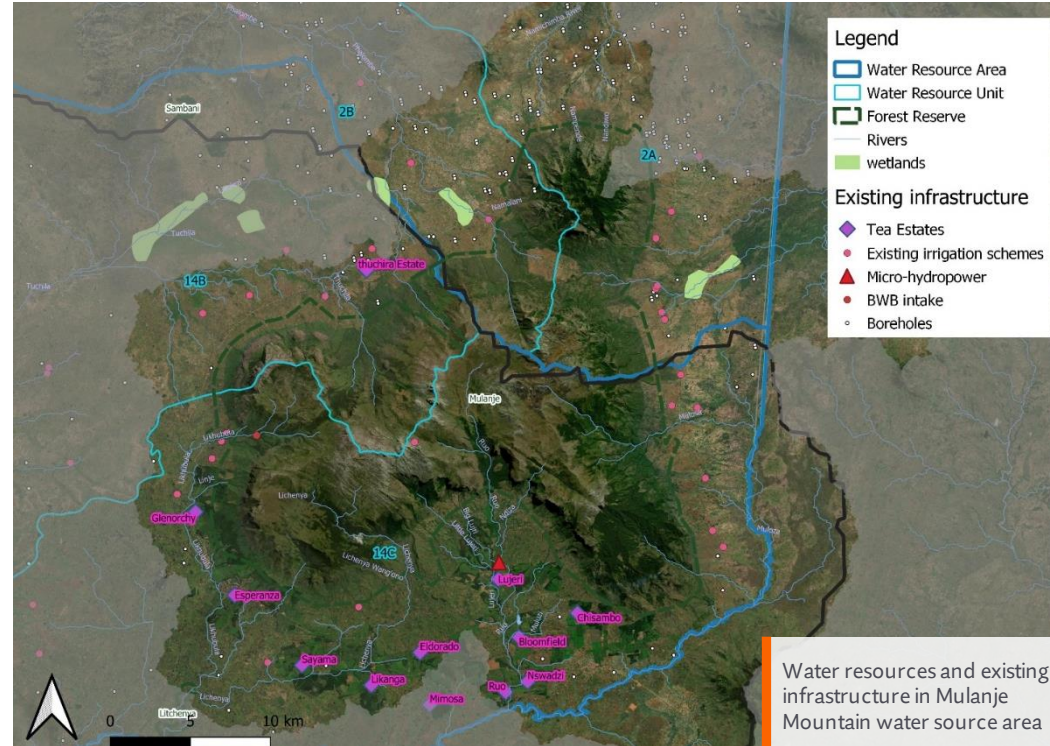
Mudi-Ndirande

- Mudi dam, in the Mudi-Ndirande Catchment, is the only potable water supply source situated in the City of Blantyre, currently providing roughly 6.5% of Blantyre's water.
- Years of **deforestation** and **land encroachment of the Ndirande Forest Reserve for agricultural and urban development** has however resulted in **high sedimentation** rates and an 80% loss of dam capacity.
- Urban and agricultural pollution from the City has resulted in serious water quality concerns.



Mulanje Mountain

- Mulanje Mountain is the source of important tributaries of the Ruo River, which feeds the Shire River, and the Likhubula River, currently providing **8.5%** of Blantyre's water.
- **Variable rainfall** and **unsustainable farming and land use practices** are constraining water supply from this source.
- The **legacy of pine plantations** as well as **deforestation** for domestic energy needs currently affects water supply. There is also high potential for **reinfestation of pines and other alien trees**.
- **Flooding** from the Ruo River tributary affects the Lower Shire (Nsanje District





3

Which Nature-based Solutions (NbS) are relevant?

There are multiple drivers of the water security challenges for the City of Blantyre. There are opportunities for NbS to play a role within a broader approach and contribute to distinct challenges. The feasibility study provides an indicative estimate for the cost of implementation and suggests the locations within the source water areas where these are likely to have the most impact.

Relevant Nature-based Solutions (NbS) – Key Catchments

Upper Shire

Forest protection, revegetation of riparian banks, improved land use practices, wetland restoration can contribute to reduced on-site erosion and sediment yields. However, the scale of these required to generate visible results is immense. Other limitations include an up to 15-year time lag for NbS to improve sedimentation issues, as well as limited impact in a system where high sedimentation and extreme flood cycles are natural.

Mudi-Ndirande

Improved land use practices such as **Conservation Agriculture** and **restoration of silt traps and check dams** (could be most significant), etc. as well as protection of what little forest remains would benefit in reducing further loss of storage capacity. To restore what has already been lost will require dredging and/or flushing (non-NbS).

Middle Shire

Forest protection, revegetation of riparian banks, improved land use practices, wetland restoration will contribute to reducing peak discharge and alleviating flood risk.

Mulanje Mountain (Likhubula River)

Catchment restoration (mixture of forest and grasslands) – particularly for areas that were put under plantations, **removal of invasive alien plants**, etc. could help improve on low flows (and yield). More investigation is required to determine the appropriate species for reforestation and revegetation.

Relevant Nature-based Solutions (NbS) – Other Catchments

Mulanje Mountain (Ruo River)

Rehabilitation of degraded forests, reforestation and afforestation, as well as rehabilitation of legacy plantations will support increased water supply, contribute to improving flood impacts, and support improved water quality downstream

Mulunguzi Dam (Zomba Plateau)

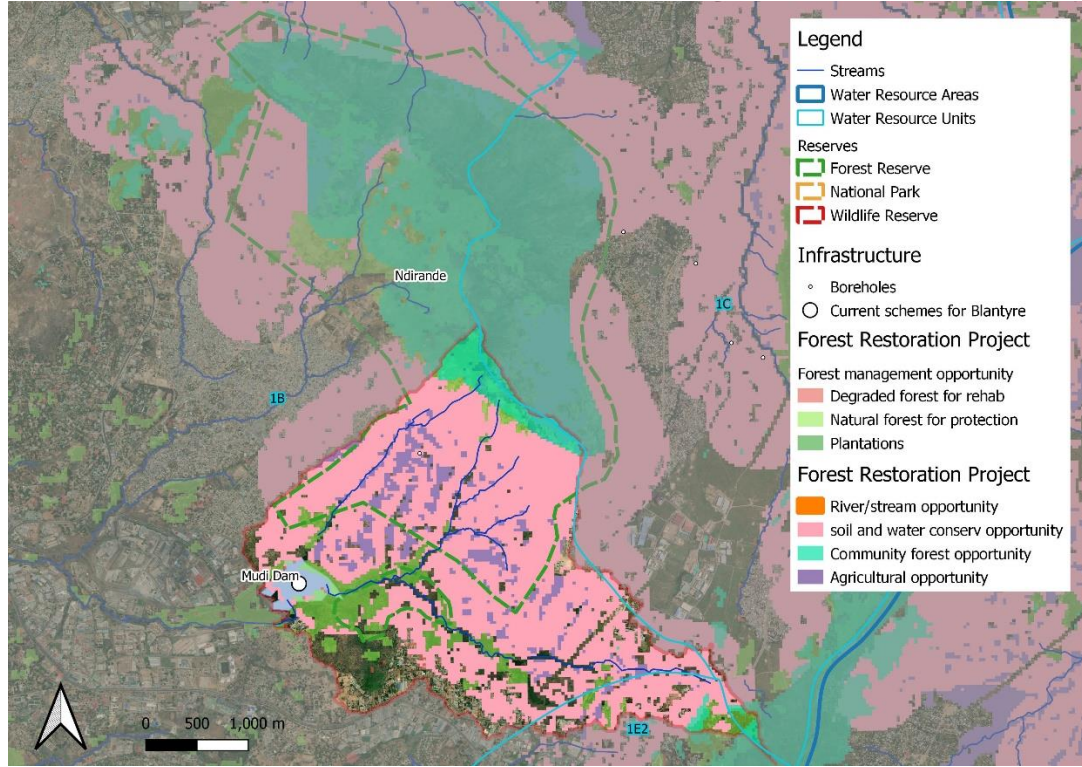
Improved land use practices such as **Conservation Agriculture** coupled with **farmer-assisted revegetation and forest rehabilitation** would support the maintenance of reservoir capacity in Mulunguzi dam. Soil and water conservation activities that reduce gully and rill erosion will further reduce the silt load for this infrastructure.

Mudi-Ndirande Interventions

The interventions proposed for the Mudi-Ndirande catchment include:

- Soil and water conservation interventions across the whole catchment;
- Conservation agriculture and agroforestry across the whole catchment;
- Community woodlots in the upper most catchment; and
- Rehabilitation of degraded forest and improved forest management around the Mudi Dam, as part of an 'Urban Park' initiative.

These locations are indicated on the map

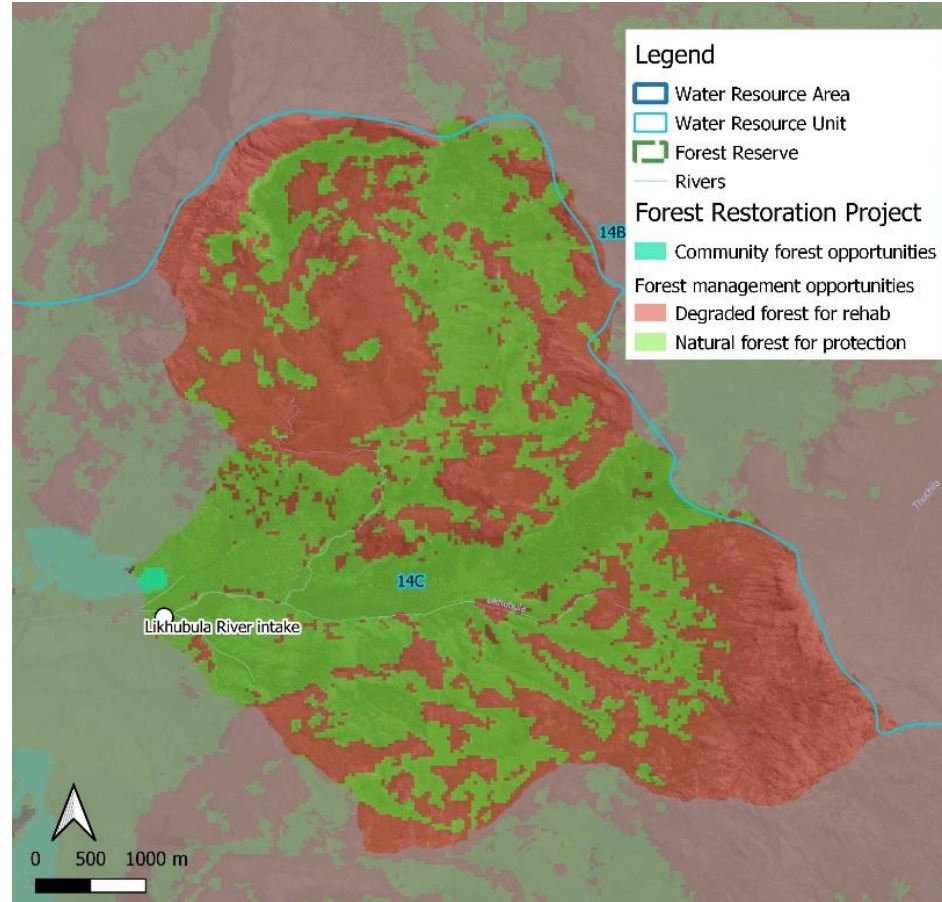


Likhubula Interventions

The interventions proposed for the Upper Shire River Basin include:

- Rehabilitation of degraded forest,
- Protection of natural forest
- Improved forest management Community Woodlots), and
- Removal of Alien Invasive Plants

The suggested locations are indicated on the map

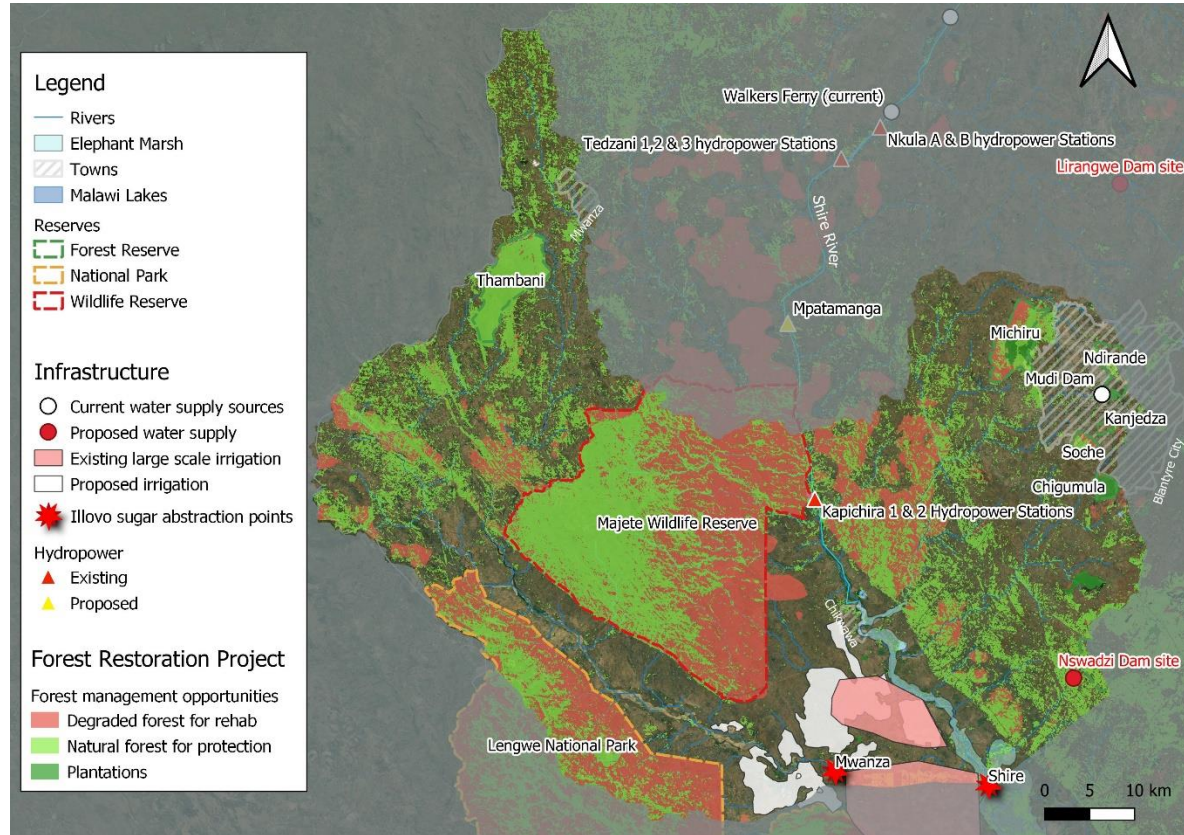


Middle Shire Interventions

The interventions proposed for the Middle Shire River Basin include:

- River and stream interventions upstream of the Illovo Sugar's abstraction points on the Shire and Mwanza Rivers;
- Soil and water conservation interventions upstream of the Illovo Sugar's abstraction points on the Shire and Mwanza Rivers, particularly in the east of the catchment;
- Conservation agriculture in the Mwanze River catchment;
- Rehabilitation of degraded forest and improved forest management in the eastern parts of Lengwe and Majete National parks;
- Community woodlots along the eastern slopes of the Shire River that are prone to flooding

These locations are indicated on the map

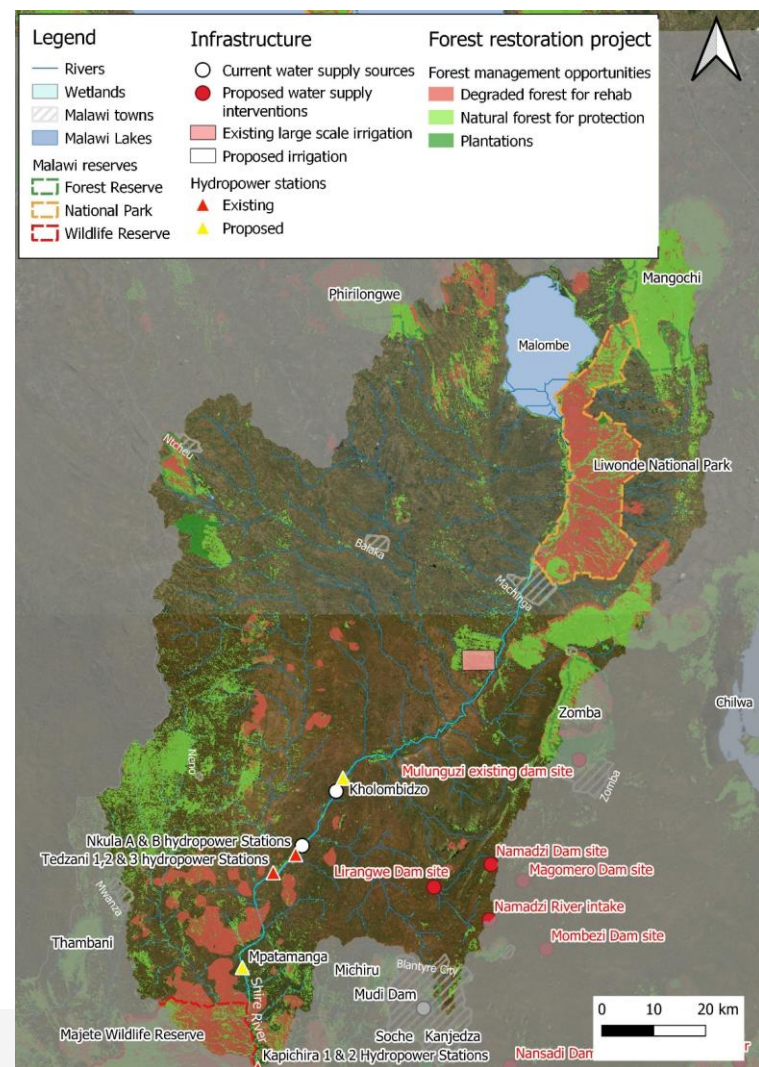


Upper Shire Interventions

The interventions proposed for the Upper Shire River Basin include:

- River and stream interventions upstream of the proposed Kholombidzo hydropower plant;
- Soil and water conservation interventions above the proposed Kholombidzo hydropower plant;
- Conservation agriculture above the proposed Kholombidzo hydropower plant;
- Rehabilitation of degraded forest and improved forest management in Liwonde national park; and
- Community woodlots in small, scattered areas across the catchment.

These locations are indicated on the map



Implementation Costs Considerations

SUMMARY	Total Costs (MKW)	Total Costs (USD)	Key Beneficiary
Upper Shire	271 281 975 341	325 538 370	EGENCO (NwRA)
Middle Shire	166 413 877 803	199 696 653	Illovo Sugar (as well as NwRA, SRWB)
Mudi-Ndirande	394 678 163	473 614	BWB, Blantyre City Council, Castel
Likhubula (Mulanje)	1 971 892 847	2 366 271	BWB, Blantyre District Council, SRWB (and communities).
Ruo (Mulanje)	14 016 194 609	16 819 434	MEGA, MMCT, SRWB and Tea Estates
Mulunguzi (Zomba Plateau)	1 242 339 911	1 490 808	SRWB (Zomba et al) and BWB (Future)
TOTAL	455 320 958 674	546 385 150	



4

Which stakeholders care, and why?

Water security for the City of Blantyre also impacts other key water users and stakeholders across all three of the source water areas.

Key Stakeholders and their desired outcome

1

Water Utilities

Blantyre and Southern Region Water Boards (BWB and SRWB)

- Security, quality, and efficiency of water supply
- Improved performance of infrastructure

2

Private sector & Parastatals

EGENCO, Illovo Sugar, Castel, Tea Estates

- Security, quality, and efficiency of water supply
- Improved performance of infrastructure

3

Conservation Organisations

Shire BEST, MEET, MMCT

- Increased Implementation Capacity to enhance biodiversity and ecosystem services

4

Local Communities

Water User and Farmers Associations

- Security, quality, and efficiency of water supply
- Improved performance of infrastructure
- Alternative livelihood options
- Increased climate resilience

5

Cross-Cutting Stakeholders

National Water Resources Authority

- Additional capacity for implementation of IWRM
- Increased resource mobilisation

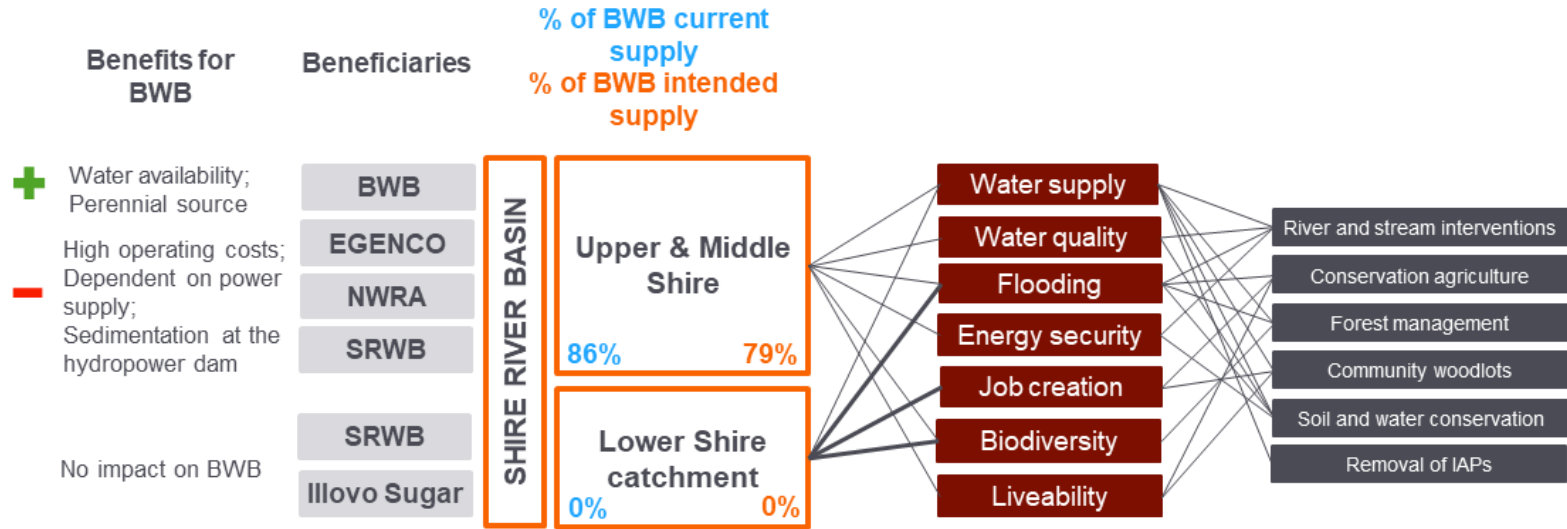
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NGOs and Development Partners

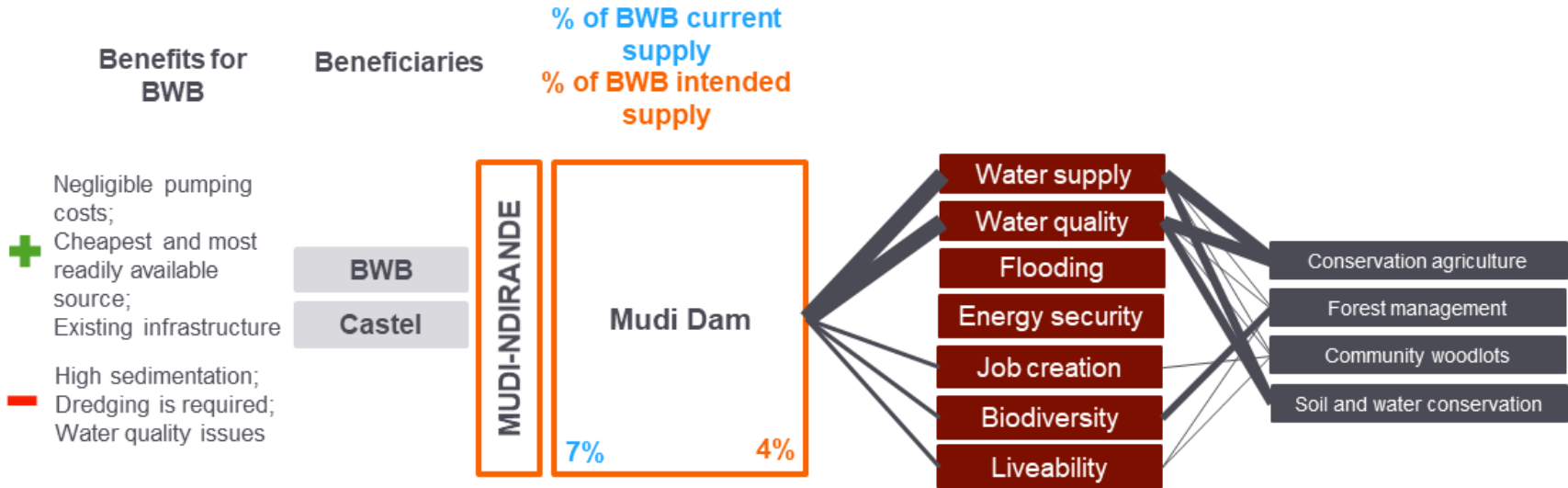
TNC, WFP, CRS (and Legado)

- Greater alignment and collective action toward source water protection
- Tangible improvement in water security and livelihoods for beneficiaries, especially local communities

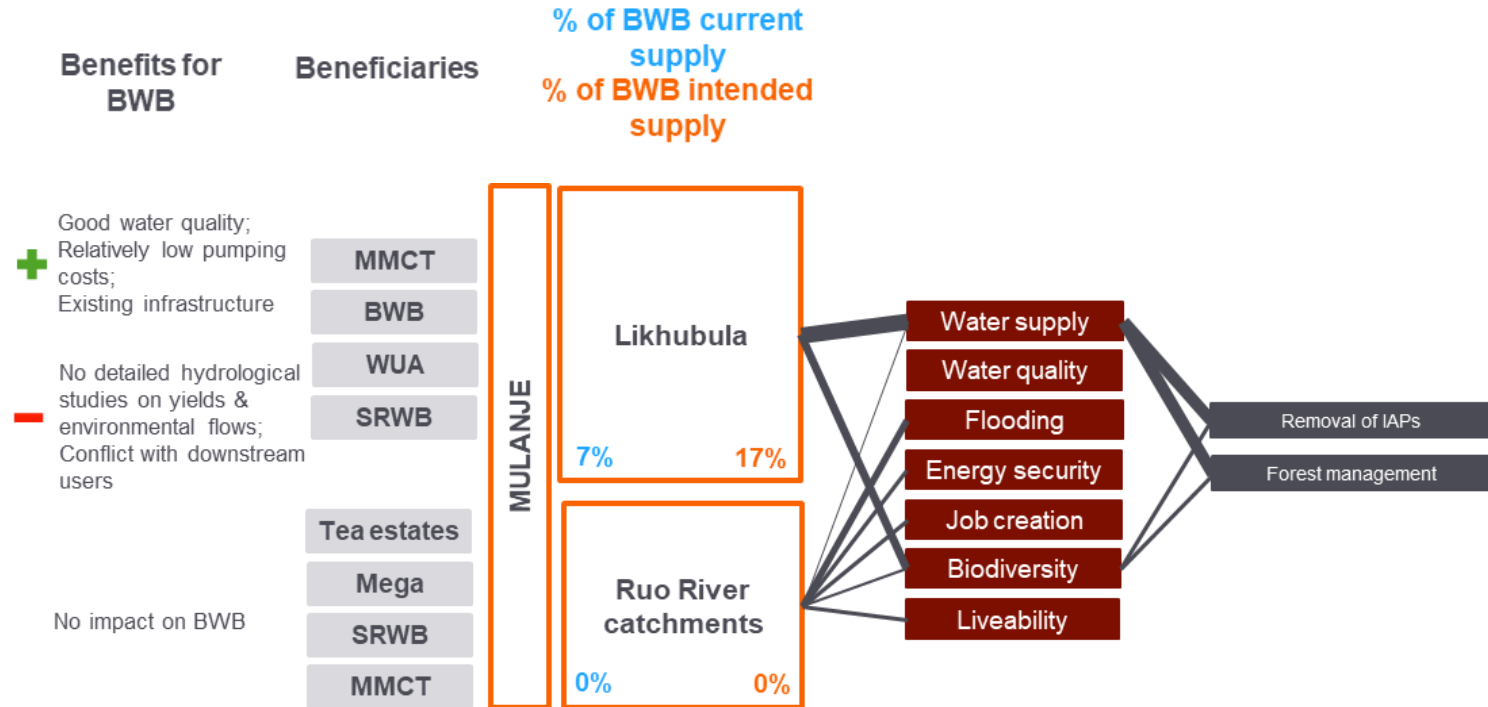
Linking beneficiaries, outcomes and NbS | Shire Basin



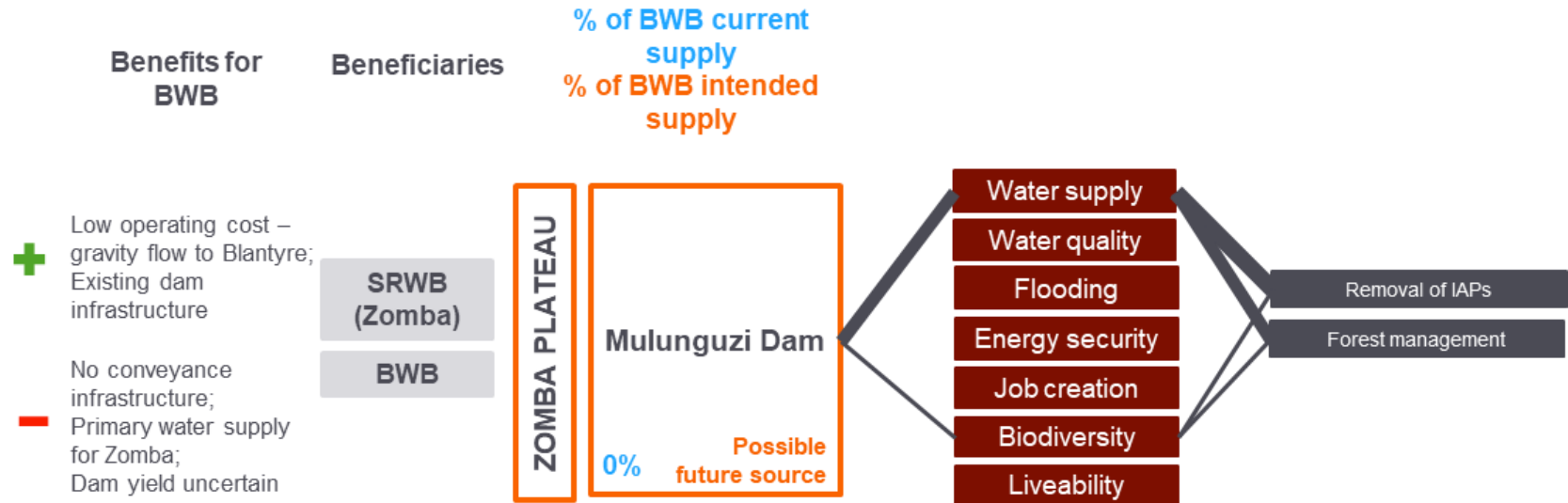
Linking beneficiaries, outcomes and NbS | Mudi-Ndirande



Linking beneficiaries, outcomes and NbS | Mulanje Mountain



Linking beneficiaries, outcomes and NbS | Zomba Plateau





5

Can collective action serve to enhance outcomes?

Collective action can serve to build institutional capacity, better align mandates and activities, and support the mobilization of resources for source water protection in the key catchments supplying the City of Blantyre. However, a phased approach that considers catchment-specific contexts and needs must be followed.

Options to be further investigated | Short Term



Collective Action Options

MUDI-NDIRANDE

Anchor funder: BWB

Key NbS: Conservation Agriculture and restoration of silt traps and check dams

Indicative Implementation Cost: +/- USD 475 000

Benefits: BWB can expect decreased sedimentation of Mudi Dam, improved water quality and operational savings by maintaining Mudi Dam as their closest and cheapest source.

LIKHUBULA MULANJE

Anchor funder: BWB

Key NbS: increased tree cover in denuded riparian buffer zones, rehabilitation of degraded forests, restoration of natural forests, community woodlots and check dams, gully plugs, infiltration ditches, assisted natural regeneration to conserve soil.

Indicative Implementation Cost: +/- USD 2.4 million

Benefits: increased water supply and quality (BWB), alternative and enhanced livelihoods (Communities and WUAs), enhanced biodiversity (MMCT).

TOTAL Funding Required for Implementation
USD 2 875 000

Options to be further investigated | Long Term



SHIRE RIVER BASIN

UPPER AND MIDDLE SHIRE

Anchor funder: EGENCO

Key NbS: afforestation, reforestation and farmer-assisted natural regeneration, check dams, gully plugs, infiltration ditches to manage sedimentation

Indicative Cost: +/- USD 325 million

Benefits: reduced silt load for hydropower dams (EGENCO)

LOWER SHIRE

Anchor funder: Illovo Sugar

Key NbS: afforestation, reforestation and farmer-assisted natural regeneration, check dams, gully plugs, infiltration ditches, improved forest management in National parks

Indicative Cost: +/- USD 188 million

Benefits: reduced silt load at abstraction points

TOTAL Funding Required for Implementation
USD 525 000 000

Further options to consider



MULUNGUZI DAM - ZOMBA PLATEAU

Key Nbs: Alien invasive clearing, rehabilitation of degraded/plantation forests, conservation agriculture

Indicative Implementation Cost: +/- USD 1.4million

Benefits: additional water yield, alternative livelihoods, enhanced biodiversity

Key Beneficiaries: SRWB (Zomba et al) and BWB (Future)

RUO RIVER - MULANJE

Key Nbs: revegetation of riparian areas, alien invasive clearing and rehabilitation of degraded forest, improved forest management

Indicative Implementation Cost: +/- USD 16.8 million

Benefits: improved water yield and quality, flood impact alleviation

Key Beneficiaries: MEGA, MMCT, SRWB and Tea Estates

A phased approach is needed

The overarching challenge for a prospective water fund is how to address Blantyre's long-term water security across three inexplicably different source water areas. The phased approach for the proposed Water Fund assists by articulating how (and when) the NbS interventions in each area contribute to an overarching value proposition for Blantyre, and generate mutual benefit to other key, local stakeholders. It will, most certainly, need to build upon key existing partnerships and fill gaps where existing activities are unable to reach the required scale. The governance mechanism will need to support alignment across decision-making in each source water area, and the financial mechanism needs to provide an attractive vehicle which pools funds to support NbS implementation at scale. To this end, the feasibility presents a long-term ambitious water fund concept that purposefully differentiates the challenges and needs of each source water area, whilst demonstrating the unique opportunity of aggregating this diversity. Critically, to achieve this long-term vision, a pragmatic and achievable phased approach is suggested, as conceptualized on the next page.

Blantyre Water Fund Concept
PHASED APPROACH

	MUDI-NDIRANDE CATCHMENT	MULANJE MOUNTAIN	SHIRE RIVER BASIN
Blantyre City (Importance of source water areas)	6% of water supply	10% of water supply	84% of water supply
Threats & Challenges	Ease of access to water Urban green infrastructure	Biodiversity, tourism, supplemental access to water	Nexus: Food, energy and water
Nature-based Solutions	Deteriorating water quality; deforestation and erosion; land encroachment	Deforestation, alien invasive species, flooding, unsustainable land use	Extensive erosion; transboundary development demands for water; flooding
	Alternative land use encouraging vegetation, rehabilitation of checkdams and silt trap structures	Tree planting in riparian buffers, assisted natural regeneration, soil and water conservation	Rehabilitation of forests, agroforestry, conservation agriculture, natural regeneration
	M U T U A L B E N E F I T		
Blantyre & Southern Region Water Boards	Improved performance and extension of useful economic life of Mudi Dam	Increased water supply, improved water quality, improved performance of infrastructure	Increased water supply, improved water quality, improved performance of infrastructure
Private Sector & Parastatals	Increased water supply & improved water quality to support operations		
Conservation Organisations	Increased implementation capacity, resource mobilisation support	Increased implementation capacity, resource mobilisation support, biodiversity protection, alternative livelihood options and climate resilience for communities	Increased implementation capacity, resource mobilisation support
Local Communities	Alternative livelihood options, additional urban green infrastructure		Alternative livelihood options, increased climate resilience
Cross-Cutting Stakeholders	Additional capacity for resource mobilisation and implementation of IWRM	Additional capacity for resource mobilisation and implementation of IWRM	Additional capacity for resource mobilisation and implementation of IWRM
IMPLEMENTATION	PRIORITY 1 Anchor Funder: BWB Implementation Cost: +/- USD475 000 Key Beneficiaries: BWB, Blantyre City Council, Castel	PRIORITY 2 (Likhubula) Anchor Funder: BWB Implementation Cost: +/- USD 2.4 million Key Beneficiaries: BWB, Blantyre District Council, SRWB (and communities)	PRIORITY 3 Anchor Funder: EGENCO (Upper Shire) & Ilovo Sugar (Middle Shire) Implementation Cost: = +/- USD 525 million Key Beneficiaries: EGENCO, NWRA, SRWB, Ilovo Sugar
Timeframe	Short Term: 2023 - 2025	Medium Term: 2025 - 2027	Long Term: post-2030



6

Is there a favourable institutional context?

While the policy environment broadly supports the development of the proposed Water Fund, misalignment between key government ministries and inconsistent implementation of the policy framework have undermined effective water resources management historically. Several institutions have expressed clear interest in specific roles and responsibilities to support the development of the Blantyre Water Fund. However, a coherent institutional form for the fund remains unclear.

Possible Steering Committee Arrangement

	Stakeholder Roles		
Potential Demonstration Catchment	Site Coordinator <i>(Convening stakeholders, drive engagement, champion planning and scoping for future development.)</i>	Anchor Funder <i>(Primary beneficiary providing demonstration funding against which additional resources can be leveraged)</i>	Implementation Lead <i>(Planning and driving implementation through local communities and other existing relevant structures)</i>
SHORT TERM			
Mudi-Ndirande (Mudi Dam)	WfP	BWB	MEET
Mulanje Mountain (Likhubula)	TNC/Legado	BWB	MMCT
LONG TERM			
Upper and Middle Shire River	CRS	EGENCO	Shire BEST
Lower Shire River	CRS	Illovo Sugar	Shire BEST

Key roles remain unclear

- **A Sponsor (Local Lead):** The institution that kicks-off the WIP development process and is the principal leading force for organizing resources and stakeholder engagement through the end of Design Phase. The Sponsor is often an existing local counterparty with significant watershed influence (such as a local water utility, basin authority or NGO).
- **A Champion:** A local individual, often representing an institution, with significant pre-existing watershed connections that is motivated to advocate for the WIP and its cause. They are a driving force, cheerleader, and spokesperson for the WIP; moreover, they typically have political gravitas that enable them to be an effective advocate. If there is a WIP Steering Committee, Champions typically sit on such structures and may even chair them.



7

What are the next steps?

Key activities, further investigation, and more detailed engagement to design a Watershed Investment Programme for Blantyre's source water areas

Conclusion

The feasibility assessment has provided a situation analysis that profiles the full water supply system for the City of Blantyre.

However, focus is now needed and it is suggested that an interim/informal (or formal if stakeholders are willing) governance structure with local sponsor/lead and champion must be agreed upon and with the objective of guiding stakeholders toward focusing and driving any subsequent phases.

The early 'proof points' or pilot projects that accelerate stakeholder interest must be prioritised – the feasibility study recommends focus areas for the next phase but ideally these must be co-identified by key stakeholders so that the scope for the next phase can be jointly developed.

The next phase can establish detailed/accurate cost-benefit profile/business case for NbS to share with prospective funders and validate their needs/concerns. This will include conducting the necessary hydrological studies to better understand the quantitative impact of the water security challenges, as well as modelling of the impact of the proposed NbS by determining the scale of implementation required etc. This would be done as part of a Business Case assessment in the next phase.

It is recommended that Local Partners who intend to take this forward host a workshop that brings key stakeholders together, communicates the foundational information compiled through the feasibility study, and aims to achieve a joint decision on the way forward for the proposed Blantyre Water Fund.

Suggested next steps

